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As submitted confidentially to the Securities and Exchange Commission on September 6, 2013

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Celladon Corporation
(Exact Name of Registrant as Specified in Its Charter)

Delaware	2836	33-0971591
(State or Other Jurisdiction of Incorporation or Organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

12760 High Bluff Drive, Suite 240
San Diego, California 92130
(858) 366-4288
(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

Krisztina M. Zsebo, Ph.D.
President and Chief Executive Officer
Celladon Corporation
12760 High Bluff Drive, Suite 240
San Diego, California 92130
(858) 366-4288
(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent for Service)

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Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this registration statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, as amended (the "Securities Act"), check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒ (Do not check if a smaller reporting company)	Smaller reporting company	☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Proposed maximum aggregate offering price(1)	Amount of registration fee(1)
Common Stock, $0.0001 par value per share	$	$

(1) Estimated solely for the purpose of calculating the amount of the registration fee in accordance with Rule 457(a) under the Securities Act. Includes the offering price of shares that the underwriters have the option to purchase to cover over-allotments, if any.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and we are not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to completion, dated , 2013

Preliminary Prospectus

Shares

Common Stock

Celladon Corporation is offering shares of its common stock. This is our initial public offering and no public market currently exists for our shares. We anticipate that the initial public offering price of our common stock will be between $ and $ per share.

We have applied to list our common stock on the NASDAQ Global Market under the symbol "CLDN."

We are an emerging growth company as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings.

	Per Share	Total
Initial price to public	$	$
Underwriting discounts and commissions(1)	$	$
Proceeds, before expenses, to Celladon Corporation	$	$

(1) We have agreed to reimburse the underwriters for certain FINRA-related expenses. See "Underwriting."

We have granted the underwriters an option for a period of 30 days to purchase up to an additional shares of common stock.

Investing in our common stock involves risks. See "Risk Factors" beginning on page 11.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities, or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares of common stock to purchasers on , 2013.

J.P. Morgan **Barclays**

Stifel **Wedbush PacGrow Life Sciences**

, 2013

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Neither we nor any of the underwriters has authorized anyone to provide you with information different from, or in addition to, that contained in this prospectus or any free writing prospectus prepared by or on behalf of us or to which we may have referred you in connection with this offering. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. Neither we nor any of the underwriters is making an offer to sell or seeking offers to buy these securities in any jurisdiction where, or to any person to whom, the offer or sale is not permitted. The information in this prospectus is accurate only as of the date on the front cover of this prospectus, regardless of the time of delivery of this prospectus or of any sale of shares of our common stock, and the information in any free writing prospectus that we may provide you in connection with this offering is accurate only as of the date of that free writing prospectus. Our business, financial condition, results of operations and future growth prospects may have changed since those dates.

Through and including , 2013 (25 days after the commencement of this offering), all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This delivery is in addition to a dealer's obligation to deliver a prospectus when acting as an underwriter and with respect to their unsold allotments or subscriptions.

This prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe these industry publications and third-party research, surveys and studies are reliable, we have not independently verified such data.

For investors outside the United States: neither we nor any of the underwriters have done anything that would permit this offering or possession or distribution of this prospectus or any free writing prospectus we may provide to you in connection with this offering in any jurisdiction where action for that purpose is required, other than in the United States. You are required to inform yourselves about, and to observe any restrictions relating to, this offering and the distribution of this prospectus and any free writing prospectus outside of the United States.

PROSPECTUS SUMMARY

This summary highlights information contained in other parts of this prospectus. Because it is only a summary, it does not contain all of the information that you should consider before investing in shares of our common stock and it is qualified in its entirety by, and should be read in conjunction with, the more detailed information appearing elsewhere in this prospectus. You should read the entire prospectus carefully, especially "Risk Factors" and our consolidated financial statements and the related notes, before deciding to buy shares of our common stock. Unless the context requires otherwise, references in this prospectus to "Celladon," "we," "us" and "our" refer to Celladon Corporation.

Overview

We are a clinical-stage biotechnology company applying our leadership position in the field of calcium dysregulation by targeting SERCA enzymes to develop novel therapies for diseases with tremendous unmet medical needs. Sarco/endoplasmic reticulum Ca^{2+}-ATPase, or SERCA, enzymes are a family of enzymes that play an integral part in the regulation of intra-cellular calcium in all human cells. Calcium dysregulation is implicated in a number of important and complex medical conditions and diseases, such as heart failure, diabetes and neurodegenerative diseases. Our therapeutic portfolio for diseases characterized by SERCA enzyme deficiency includes both gene therapies and small molecule compounds. MYDICAR, our most advanced product candidate, uses gene therapy to target SERCA2a, which is an enzyme that becomes deficient in patients with heart failure. SERCA2a was scientifically validated as a molecular target for heart failure in the 1990s and became a focus of internal discovery efforts for many large pharmaceutical companies. However, to date, no other company has been successful in targeting SERCA2a using traditional discovery methods. We believe that our approach to modulating SERCA2a overcomes the issues encountered by previous efforts and our gene therapy approach has the potential to provide transformative disease-modifying effects with long-term benefits in patients with heart failure. In addition, we have identified a number of potential first-in-class compounds addressing novel targets in diabetes and neurodegenerative diseases with our small molecule platform of SERCA2b modulators.

We are the first company to enter clinical development with a product candidate that selectively targets SERCA2a. In a 39-patient randomized, double-blind, placebo-controlled Phase 2a trial in patients with systolic heart failure, which we refer to as CUPID 1, MYDICAR was found to be safe and well-tolerated, reduced heart failure-related hospitalizations, improved patients' symptoms, quality of life and serum biomarkers, and improved key markers of cardiac function predictive of survival, such as end systolic volume. Based on these results, as well as our previous preclinical studies and clinical trials, we advanced MYDICAR to a 200-patient randomized, double-blind, placebo-controlled international Phase 2b trial in patients with systolic heart failure, which we refer to as CUPID 2. We expect to complete enrollment of CUPID 2 in the first quarter of 2014 and announce results in mid-2015. If successful, these results, along with other studies, will form the basis for regulatory submissions for approval with the United States Food and Drug Administration, or FDA, and European Medicines Agency, or EMA. In 2012, we obtained a Special Protocol Assessment, or SPA, whereby the FDA agreed to use time-to-multiple heart failure-related hospitalizations as the primary endpoint for a MYDICAR Phase 3 pivotal trial. Our ongoing CUPID 2 trial uses a similar clinical protocol with identical endpoints as agreed to in the SPA.

According to the American Heart Association, there are nearly six million patients currently diagnosed with heart failure in the United States. Despite optimal guideline-directed therapies employing a wide range of pharmacologic, device, and surgical options, many heart failure patients deteriorate over time and the long-term prognosis associated with heart failure is worse than that associated with the majority of cancers, with a mortality rate of approximately 50% at five years following initial diagnosis. There are one million primary heart failure-related hospitalizations annually in the United States. In 2010, the estimated direct and indirect cost of heart failure in the United States was $39 billion, half of which was related to repeated hospitalizations. The one-

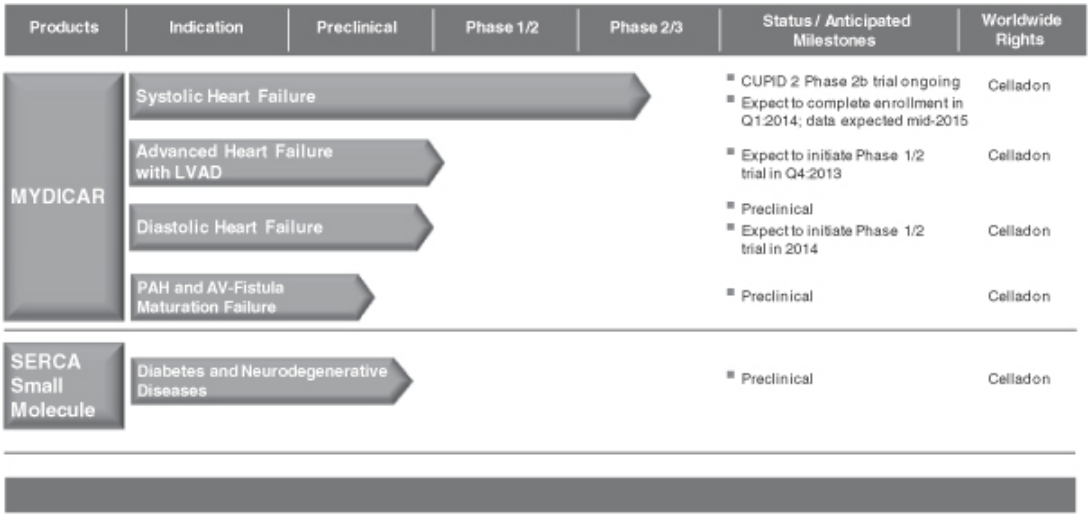
and six-month readmission rates after heart failure-related hospitalization are close to 25% and 50%, respectively, and there is growing pressure on hospitals to reduce readmissions for heart failure.

We are initially developing MYDICAR to treat patients with systolic heart failure. The broad potential of MYDICAR in multiple indications presents opportunities to maximize the value of our development programs for indications that are poorly managed by existing treatment options. We also plan to develop MYDICAR for additional indications, such as diastolic heart failure, arteriovenous, or AV, fistula maturation failure, and pulmonary arterial hypertension, or PAH, as well as for the treatment of patients with advanced heart failure who are on a left-ventricular assist device, or LVAD. AV-fistula maturation failure and PAH are characterized by a SERCA2a deficiency in vascular smooth muscle cells, and MYDICAR has demonstrated potential disease-modifying capability in preclinical models of these diseases. We plan to initiate a Phase 1/2 trial in 2014 for the treatment of diastolic heart failure with MYDICAR.

We hold worldwide rights to MYDICAR and our small molecule platform of SERCA modulators in all indications and markets. We plan to commercialize MYDICAR for all approved heart failure indications using a targeted sales force in the United States focused on selected cardiologists and heart failure specialists who treat the majority of heart failure patients. We believe we can maximize the value of our company by retaining substantial commercialization rights to our product candidates and, where appropriate, entering into partnerships to develop and commercialize certain product candidates in specific therapeutic indications and/or geographic territories.

Our Product Pipeline

The following chart depicts key information regarding our development programs, their indications, and their current stage of development:



MYDICAR: Genetic Enzyme Replacement Therapy of SERCA2a Deficiency

Our lead product candidate, MYDICAR, uses genetic enzyme replacement therapy to correct the SERCA2a enzyme deficiency in heart failure patients that results in inadequate pumping of the heart. MYDICAR is delivered directly to the heart in a routine outpatient procedure, similar to an angiogram, in a cardiac catheterization laboratory. MYDICAR utilizes a recombinant adeno-associated viral vector serotype 1, or AAV1,

to deliver the gene for the normal human SERCA2a enzyme. We believe AAV1 serotype vectors are particularly well suited for administration to the heart muscle because adeno-associated virus, or AAV, vectors are safe and are less immunogenic than other viral vectors commonly used in gene therapy, which have caused inflammatory reactions in some patients. Most people are exposed to the wild type of AAV during childhood, without experiencing any symptoms because AAV causes no disease. In addition, local delivery of AAV1 to the heart requires extremely small quantities to achieve a therapeutic effect, which has contributed to the low incidence of side effects in clinical trials to date. We have developed a companion diagnostic to identify the approximately 50% of patients in the United States who are AAV1 NAb negative and therefore eligible for MYDICAR treatment. MYDICAR has the potential to provide transformative disease-modifying effects with long-term benefits in heart failure patients with a single administration. MYDICAR is initially being developed to treat patients with systolic heart failure, which is characterized by a decreased contraction of the heart muscle. With over 280,000 heart failure-related deaths annually in the United States, we believe MYDICAR will provide a much needed therapeutic alternative for heart failure patients. We estimate that there are over 400,000 systolic heart failure patients in the United States alone who will be eligible for MYDICAR therapy upon launch.

MYDICAR for Systolic Heart Failure

MYDICAR was initially evaluated in a Phase 1 open-label, dose-escalation trial in which patients with heart failure received a single intracoronary infusion of MYDICAR on top of maximal optimized heart failure therapy. Of the 12 patients who received MYDICAR, several demonstrated improvements from baseline to month six across a number of parameters important in heart failure. Based on these results, we advanced MYDICAR to CUPID 1. In this 39-patient trial, MYDICAR was found to be safe and well-tolerated, reduced heart failure-related hospitalizations, improved patients' symptoms and quality of life, and improved key markers of cardiac function predictive of survival, such as elevated levels of natriuretic peptides and end systolic volume. The CUPID 1 trial included a single intracoronary infusion of MYDICAR followed by an on-study observation period of 12 months, plus a two-year long-term follow-up period. High-dose MYDICAR (1×10^{13} DNase resistant particles) met the primary endpoint versus placebo at six months, and all positive trends were confirmed at 12 months. The hazard ratio at 12 months for the high-dose MYDICAR group versus placebo for recurrent adjudicated clinical events was 0.12 ($p=0.003$, where p-value is the statistical probability of a result due to chance alone) representing a risk reduction of 88% with MYDICAR versus placebo. Benefit in preventing clinical events such as hospitalizations has been confirmed at three years as well as a trend in improved survival.

Following the completion of our CUPID 1 trial, we received Fast Track designation from the FDA in December 2011 for MYDICAR for the treatment of systolic heart failure in New York Heart Association Class III/IV heart failure patients. Subsequently, we held an End-of-Phase 2 meeting with the FDA, as a result of which the FDA has indicated that: data supported proceeding to a Phase 3 clinical trial with high-dose MYDICAR; our proposed safety database, which will include approximately 610 patients (one-half treated), may be acceptable if the safety profile is similar to CUPID 1; time-to-recurrent heart failure-related hospitalizations, in the presence of terminal events (all-cause death, LVAD implantation, and heart transplant), is acceptable as the primary endpoint, pending details of the statistical analysis plan and further discussion with agency statisticians; and a single clinical trial may be acceptable for a biologics license application, or BLA, submission assuming statistically significant primary outcome and strong concordance of primary and secondary endpoint analyses. We have also held a Type A meeting with the FDA, as a result of which the FDA approved a 572-patient Phase 3 trial protocol under the SPA guidance and agreed that the design and planned analyses of this trial would be sufficient to provide data that, depending on outcome, could support a BLA submission. Pursuant to the SPA, we also obtained an agreement from the FDA that the primary efficacy endpoint of time-to-recurrent heart failure-related hospitalizations in the presence of terminal events would be acceptable for a pivotal trial of MYDICAR. This endpoint counts multiple heart failure-related hospitalizations per patient, and "corrects" for the occurrence of terminal events.

Based on the CUPID 1 results and following discussions with the FDA, we advanced MYDICAR to our CUPID 2 Phase 2b trial. The primary objective of our ongoing CUPID 2 trial is to determine the efficacy of a single intracoronary infusion of high-dose MYDICAR compared to placebo, in conjunction with maximal optimized heart failure therapy, in reducing the frequency of and/or delaying heart failure-related hospitalizations in patients with systolic heart failure (having an ejection fraction less than 45%) who are at increased risk of terminal events based on elevated levels of natriuretic peptides or a recent heart failure-related hospitalization. Ejection fraction, or EF, is the measurement used to describe the contractility of the heart. The dose being used in this trial is equivalent to the high-dose used in CUPID 1. Patients are randomized in parallel to high-dose MYDICAR or placebo in a 1:1 ratio. A total of 200 patients will be enrolled to obtain at least 180 adjudicated heart failure-related hospitalizations. The primary efficacy endpoint is time-to-recurrent heart failure-related hospitalizations in the presence of terminal events at the time of primary analysis data cutoff. We expect to complete enrollment of this trial in the first quarter of 2014 and announce results in mid-2015.

Upon completion of our ongoing CUPID 2 trial, we plan to discuss results with the FDA and the EMA with the possibility that MYDICAR could qualify for expedited approval if the trial outcome demonstrates substantial reduction in recurrent heart failure-related hospitalizations and concordant trends in reduction in and/or delay of terminal events overall, and death in particular. However, if the FDA requires another trial, we have an SPA in place for a 572-patient Phase 3 pivotal trial using the same endpoint as in our CUPID 2 trial. We believe the results of one or both of these trials could support submission of a BLA and a Marketing Authorization Application, or MAA, filing for MYDICAR for the treatment of systolic heart failure.

MYDICAR will also be evaluated in an investigator-initiated trial called AGENT-HF, an AAV1 NAb positive trial called CELL-005, and a viral shedding trial called CELL-006. The primary objective of the AGENT-HF trial is to determine whether treatment with MYDICAR leads to reverse remodeling of the heart. This trial will enroll approximately 44 heart failure patients in France with half receiving MYDICAR and the other half placebo. The primary endpoint at six months will be change, compared to baseline, in left ventricular end systolic volume as measured by cardiac computed tomography. The primary objective of the AAV1 NAb positive trial is to determine the safety of a single intracoronary infusion of high-dose MYDICAR in patients who test positive for NAbs who would otherwise be ineligible for treatment with MYDICAR. The FDA has required this approximately 60 to 80 patient safety trial, as a condition to the submission of a BLA, to cover the possibility that MYDICAR may be used in NAb positive patients. The viral shedding trial is required by the FDA as part of the environmental risk assessment that must be included in a marketing application to regulatory authorities, both in the United States and in Europe. In this open-label trial, ten patients with heart failure will be treated with high-dose MYDICAR and will be followed until they have two consecutive bodily fluid samples that are negative for presence of the SERCA2a gene. The patients would continue to be followed for safety for up to two years to add to the overall MYDICAR safety database. We expect to initiate the AAV1 NAb positive and viral shedding trials in 2014.

MYDICAR in Additional Indications

Beyond our proposed lead indication of systolic heart failure, we also plan to develop MYDICAR for additional indications such as diastolic heart failure, treatment of AV-fistula maturation failure, and PAH, as well as for the treatment of patients with advanced heart failure who are on an LVAD. Each of these conditions is characterized by a SERCA2a deficiency, and MYDICAR has demonstrated disease-modifying capability in preclinical models of these diseases.

Strategy

We are committed to applying our first-mover scientific leadership position in the field of SERCA2 enzymes to transform the lives of patients with debilitating, life-threatening diseases or conditions. Each of our ongoing and planned development projects addresses diseases or conditions with high unmet medical need that are characterized by an underlying SERCA2 enzyme deficiency. The core elements of our strategy include:

- successfully develop MYDICAR as a novel, first-in-class therapy for patients with heart failure due to systolic dysfunction;
- advance MYDICAR through an expedited development and approval process;
- maximize the value of our MYDICAR franchise by expanding into additional indications;
- commercialize MYDICAR using a highly-targeted cardiology-focused sales force in the United States;
- advance our small molecule platform targeting SERCA2 enzymes; and
- deploy capital strategically to develop our portfolio of product candidates and create shareholder value.

Risks Associated With Our Business

Our business and our ability to implement our business strategy are subject to numerous risks, as more fully described in the section entitled “Risk Factors” immediately following this prospectus summary. You should read these risks before you invest in our common stock. We may be unable, for many reasons, including those that are beyond our control, to implement our business strategy. In particular, risks associated with our business include:

- We have incurred significant losses since our inception, which we anticipate will continue for the foreseeable future. We have never generated revenue from product sales and may never be profitable.
- Failure to obtain additional funding when needed may force us to delay, limit or terminate our product development efforts or other operations.
- MYDICAR is based on a novel technology, which makes it difficult to predict the time and cost of product candidate development and, subsequently, for obtaining regulatory approval.
- We are highly dependent on the success of MYDICAR and we may not be able to successfully obtain regulatory or marketing approval for, or successfully commercialize, this product candidate.
- We may find it difficult to enroll patients in our clinical trials, which could delay or prevent clinical trials of our product candidates.
- Failure to successfully validate, commercialize and obtain regulatory approval for our companion diagnostic could delay or prevent commercialization of MYDICAR.
- If our product candidates fail to demonstrate safety and efficacy to the satisfaction of regulatory authorities, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.
- We rely on third parties to conduct some or all aspects of our current vector production, product manufacturing, companion diagnostic testing, reagent manufacturing, protocol development, research, and preclinical and clinical testing. If they fail to meet deadlines or perform in an unsatisfactory manner, our business could be harmed.
- The commercial success of any current or future product candidate will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community.
- Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.

- If we are unable to obtain or protect intellectual property rights related to our product candidates, we may not be able to compete effectively in our markets.

Corporate Information

We were originally incorporated in California in December 2000. In April 2012, we reincorporated in Delaware. Our principal executive offices are located at 12760 High Bluff Drive, Suite 240, San Diego, California 92130, and our telephone number is (858) 366-4288. Our corporate website address is www.celladon.net. Information contained on or accessible through our website is not a part of this prospectus, and the inclusion of our website address in this prospectus is an inactive textual reference only.

We have obtained a registered trademark for MYDICAR® in the United States. This prospectus contains references to our trademarks and to trademarks belonging to other entities. Solely for convenience, trademarks and trade names referred to in this prospectus, including logos, artwork and other visual displays, may appear without the ® or TM symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other companies' trade names or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other company.

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least $1.0 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeded $700.0 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period. We refer to the Jumpstart Our Business Startups Act of 2012 in this prospectus as the "JOBS Act," and references in this prospectus to "emerging growth company" have the meaning associated with it in the JOBS Act.

The Offering

Common stock offered by us	shares
Common stock to be outstanding after this offering	shares
Option to purchase additional shares	We have granted to the underwriters the option, exercisable for 30 days from the date of this prospectus, to purchase up to additional shares of common stock.
Use of proceeds	We estimate that we will receive net proceeds of approximately $ million (or approximately $ million if the underwriters' option to purchase additional shares is exercised in full) from the sale of the shares of common stock offered by us in this offering, based on an assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering to fund (1) research and development activities related to MYDICAR for the treatment of systolic heart failure, which includes the development of manufacturing capabilities for the commercial production of MYDICAR and commercial scale-up, validation and automation of our companion diagnostic, (2) research and development activities related to MYDICAR for other indications, (3) research and development activities related to our SERCA small molecule program, and (4) other working capital and general corporate purposes. See "Use of Proceeds."
Risk factors	You should read the "Risk Factors" section of this prospectus for a discussion of certain of the factors to consider carefully before deciding to purchase any shares of our common stock.
Proposed NASDAQ Global Market symbol	CLDN

The number of shares of our common stock to be outstanding after this offering is based on 150,322,151 shares of common stock outstanding as of June 30, 2013, and excludes:

- 16,975,497 shares of common stock issuable upon the exercise of outstanding stock options as of June 30, 2013, at a weighted-average exercise price of $0.18 per share;
- 8,777 shares of common stock issuable upon the exercise of outstanding warrants as of June 30, 2013, at a weighted-average exercise price of $2.94 per share, which outstanding warrants will be automatically cancelled upon the closing of this offering if not previously exercised;
- 2,070,000 shares of common stock reserved for future issuance under our 2013 employee stock purchase plan, or the ESPP, which will become effective upon the execution and delivery of the underwriting agreement for this offering; and
- 8,415,000 shares of common stock reserved for future issuance under our 2013 equity incentive plan, or the 2013 plan, which will become effective upon the execution and delivery of the underwriting agreement for this offering, plus 1,688,678 shares of common stock reserved for issuance under our

2012 equity incentive plan, or the 2012 plan, as of June 30, 2013, which shares will be added to the shares reserved under the 2013 plan upon its effectiveness.

Unless otherwise indicated, all information contained in this prospectus assumes:

- the conversion of all our outstanding preferred stock as of June 30, 2013 into an aggregate of 139,278,610 shares of common stock in connection with the closing of this offering;
- no exercise by the underwriters of their option to purchase up to an additional shares of our common stock;
- the filing of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws immediately prior to the closing of this offering; and
- a one-for- reverse stock split of our common stock to be effected prior to the closing of this offering.

SUMMARY FINANCIAL DATA

The following summary financial data should be read together with our consolidated financial statements and related notes, "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" appearing elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future and results of interim periods are not necessarily indicative of the results for the entire year.

We changed our fiscal year end from June 30 to December 31, effective for the fiscal period ended December 31, 2011. We derived the summary statement of operations data for the fiscal year ended June 30, 2011, the six months ended December 31, 2011 and the year ended December 31, 2012 from our audited consolidated financial statements and related notes appearing elsewhere in this prospectus. We derived the summary statement of operations data for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013 and balance sheet data as of June 30, 2013 from our unaudited consolidated financial statements and related notes appearing elsewhere in this prospectus.

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Six Months Ended June 30,		Period from December 21, 2000 (inception) to June 30, 2013
				2012	2013	
				(unaudited)		(unaudited)
	(in thousands, except share and per share data)					
Consolidated Statements of Operations Data:						
Operating expenses:						
Research and development	$ 4,193	$ 1,252	$ 13,314	$ 7,867	$ 7,136	$ 82,253
General and administrative	1,832	920	2,631	1,383	1,328	17,813
Total operating expenses	6,025	2,172	15,945	9,250	8,464	100,066
Loss from operations	(6,025)	(2,172)	(15,945)	(9,250)	(8,464)	(100,066)
Other income (expense)	(965)	(689)	74	(161)	5	(1,138)
Consolidated net loss	(6,990)	(2,861)	(15,871)	(9,411)	(8,459)	(101,204)
Net loss attributable to non-controlling interest	—	—	154	72	96	250
Net loss attributable to Celladon Corporation	(6,990)	(2,861)	(15,717)	(9,339)	(8,363)	(100,954)
Accretion to redeemable convertible preferred stock	—	—	(343)	(341)	—	(343)
Change in fair value of non-controlling interest	—	—	(154)	(72)	(3,105)	(3,259)
Net loss attributable to common stockholders	$ (6,990)	$ (2,861)	$ (16,214)	$ (9,752)	$ (11,468)	$ (104,556)
Other comprehensive loss:						
Unrealized gain (loss) on investments	—	—	9	—	(7)	2
Comprehensive loss	$ (6,990)	$ (2,861)	$ (15,862)	$ (9,411)	$ (8,466)	$ (101,202)
Net loss per share attributable to common stockholders, basic and diluted(1)	$ (217.66)	$ (81.56)	$ (1.58)	$ (1.03)	$ (1.04)	
Weighted-average shares outstanding, basic and diluted(1)	32,115	35,079	10,261,532	9,470,930	11,043,541	
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)(1)			$ (0.15)		$ (0.06)	
Pro forma weighted-average shares outstanding, basic and diluted (unaudited)(1)			107,053,441		150,322,151	

(1) See Note 1 to our consolidated financial statements appearing elsewhere in this prospectus for an explanation of the method used to calculate historical and pro forma basic and diluted net loss per common share attributable to common stockholders and the number of shares used in the computation of the per share amounts.

	As of June 30, 2013		
	Actual	Pro Forma(1)	Pro Forma As Adjusted(2) (3)
	(unaudited, in thousands)		
Consolidated Balance Sheet Data:			
Cash, cash equivalents and investments	$ 27,977	$ 27,977	$
Working capital	25,860	25,860	
Total assets	28,386	28,386	
Redeemable convertible preferred stock	60,098	—	
Junior preferred stock	5,450	—	
Deficit accumulated during the development stage	(100,954)	(100,954)	
Total stockholders' equity (deficit)	(39,625)	25,923	

(1) Pro forma amounts reflect the conversion of all our outstanding shares of preferred stock as of June 30, 2013 into an aggregate of 139,278,610 shares of our common stock in connection with the closing of this offering.

(2) Pro forma as adjusted amounts reflect the pro forma conversion adjustments described in footnote (1) above, as well as the sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

(3) A $1.00 increase (decrease) in the assumed initial public offering price would increase (decrease) each of cash and cash equivalents, working capital, total assets and total stockholders' equity (deficit) by $ million, assuming the number of shares offered by us as stated on the cover of this prospectus remain unchanged and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, a one million share increase (decrease) in the number of shares offered by us, as set forth on the cover of this prospectus, would increase (decrease) each of cash and cash equivalents, working capital, total assets and total stockholders' equity (deficit) by $ million, assuming the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover of this prospectus) remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

RISK FACTORS

An investment in shares of our common stock involves a high degree of risk. You should carefully consider the following information about these risks, together with the other information appearing elsewhere in this prospectus, before deciding to invest in our common stock. The occurrence of any of the following risks could have a material adverse effect on our business, financial condition, results of operations and future growth prospects. In these circumstances, the market price of our common stock could decline, and you may lose all or part of your investment.

Risks Related to our Financial Condition and Capital Requirements

We have incurred significant losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future.

We are a clinical-stage biotechnology company and we have not yet generated any revenues. We have incurred net losses in each year since our inception, including consolidated net losses of $7.0 million for the fiscal year ended June 30, 2011, $2.9 million for the six months ended December 31, 2011, $15.9 million for the year ended December 31, 2012 and $8.5 million for the six months ended June 30, 2013. As of June 30, 2013, we had an accumulated deficit of approximately $101.0 million. Our prior losses, combined with expected future losses, have had and may continue to have an adverse effect on our stockholders' equity and working capital.

We have devoted most of our financial resources to research and development, including developing our manufacturing capabilities and preclinical and clinical development activities. To date, we have financed our operations primarily through the sale of equity securities and convertible debt. The amount of our future net losses will depend, in part, on the rate of our future expenditures and our ability to obtain funding through equity or debt financings or strategic collaborations. We have not completed pivotal clinical trials for any product candidate and it will be several years, if ever, before we have a product candidate ready for commercialization. Even if we obtain regulatory approval to market a product candidate (and, if necessary, any related companion diagnostic), our future revenues will depend upon the size of any markets in which our product candidates have received approval, and our ability to achieve sufficient market acceptance, reimbursement from third-party payors and adequate market share for our product candidates and companion diagnostic in those markets.

We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. We anticipate that our expenses will increase substantially if and as we:

- expand or accelerate our clinical development activities, particularly with respect to our clinical trials of MYDICAR for systolic heart failure, including our CUPID 2 trial of MYDICAR, our AAV1 NAb positive trial and our viral shedding trial, as well as our preclinical studies and clinical trials of MYDICAR for diastolic heart failure and other indications;
- further develop the manufacturing process for our vectors or our product candidates including commercial scale-up, validation and automation of our companion diagnostic;
- seek regulatory and marketing approvals for MYDICAR and any other product candidate that successfully completes clinical trials;
- seek regulatory and marketing approvals for our companion diagnostic;
- establish a sales, marketing and distribution infrastructure in the United States to commercialize any products for which we obtain marketing approval;
- initiate additional preclinical, clinical or other studies for our product candidates;
- expand and accelerate development of our small molecule programs in the fields of diabetes and neurodegenerative diseases;
- acquire rights to other product candidates and technologies;

- change or add additional manufacturers or suppliers;
- maintain, expand and protect our intellectual property portfolio;
- continue our research and preclinical development of our product candidates and seek to identify and validate additional product candidates;
- make milestone or other payments under any in-license or collaboration agreement;
- attract and retain skilled personnel;
- create additional infrastructure to support our operations as a public company and our product development and planned future commercialization efforts; and
- experience any delays or encounter issues with any of the above.

The net losses we incur may fluctuate significantly from quarter-to-quarter and year-to-year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance. In any particular quarter or quarters, our operating results could be below the expectations of securities analysts or investors, which could cause our stock price to decline.

We have never generated any revenue from product sales and may never be profitable.

Our ability to generate meaningful revenue and achieve profitability depends on our ability, and the ability of any third party with which we may partner, to successfully complete the development of, and obtain the regulatory approvals necessary to, commercialize our product candidates and any related companion diagnostics. We do not anticipate generating revenues from product sales for the foreseeable future, if ever. If any of our product candidates fail in clinical trials or if any of our product candidates or any related companion diagnostics do not gain regulatory approval, or if any of our product candidates and any related companion diagnostics, if approved, fail to achieve market acceptance, we may never become profitable. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our ability to generate future revenues from product sales depends heavily on our success in:

- completing research and preclinical and clinical development of our product candidates;
- seeking and obtaining regulatory and marketing approvals for product candidates for which we complete clinical trials;
- developing a sustainable, scalable, reproducible, and transferable manufacturing process for our vectors and product candidates;
- automating, validating and seeking and obtaining regulatory approvals for our companion diagnostic on a timely basis;
- establishing and maintaining supply and manufacturing relationships with third parties that can provide adequate (in amount and quality) products and services to support clinical development and, if approved, the market demand for our product candidates;
- launching and commercializing product candidates for which we obtain regulatory and marketing approval, either by establishing a sales force, marketing and distribution infrastructure, or by collaborating with a partner;
- obtaining market acceptance of any approved products and gene therapy as a viable treatment option;
- addressing any competing technological and market developments;
- implementing additional internal systems and infrastructure, as needed;
- identifying and validating new product candidates;
- negotiating favorable terms in any collaboration, licensing or other arrangements into which we may enter;

- maintaining, protecting and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how; and
- attracting, hiring and retaining qualified personnel.

Even if one or more of the product candidates that we develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product. Our expenses could increase beyond expectations if we are required by the FDA, the EMA, or other foreign regulatory authorities to perform clinical trials and other studies in addition to those that we currently anticipate. Even if we are able to generate revenues from the sale of any approved products, we may not become profitable and may need to obtain additional funding to continue operations.

Even if this offering is successful, we will need to raise additional funding, which may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development efforts or other operations.

We are currently advancing our lead product candidate, MYDICAR for the treatment of systolic heart failure, through clinical development and other product candidates through preclinical development. Developing products is expensive, and we expect our research and development expenses to increase substantially in connection with our ongoing activities, particularly as we advance our product candidates in clinical trials.

Our operations have consumed substantial amounts of cash since inception. As of June 30, 2013, our cash, cash equivalents and investments were $28.0 million. Our research and development expenses were $4.2 million and $13.3 million for the fiscal years ended June 30, 2011 and December 31, 2012, respectively, and $7.1 million for the six months ended June 30, 2013. We are currently enrolling patients in our CUPID 2 trial of MYDICAR for systolic heart failure. In 2014, we plan to initiate our Phase 1/2 trial of MYDICAR for diastolic heart failure, our AAV1 NAb positive trial and our viral shedding trial. We believe that the net proceeds from this offering and our existing cash, cash equivalents and investments will be sufficient to fund our current operations through our expected receipt of data from our CUPID 2 trial in mid-2015. This period could be shortened if there are any significant increases beyond our expectations in spending on development programs or more rapid progress of development programs than anticipated. We do not expect our existing capital resources, including the net proceeds from this offering, to be sufficient to enable us to begin a Phase 3 trial of MYDICAR for systolic heart failure, if required, or to complete our Phase 1/2 trial of MYDICAR for diastolic heart failure, our AAV1 NAb positive trial or our viral shedding trial, if any of such trial is commenced. See “Use of Proceeds.” Furthermore, our operating plan may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings, government or other third-party funding, marketing and distribution arrangements and other collaborations, strategic alliances and licensing arrangements, or a combination of these approaches. In any event, we will require additional capital to obtain regulatory approval for, and to commercialize, our product candidates and companion diagnostic. Even if we believe we have sufficient funds for our current or future operating plans, we may seek additional capital if market conditions are favorable or if we have specific strategic considerations.

Any additional fundraising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to develop and commercialize our product candidates and companion diagnostic. In addition, we cannot guarantee that future financing will be available in sufficient amounts or on terms acceptable to us, if at all. We could also be required to seek funds through arrangements with collaborative partners or otherwise at an earlier stage than would otherwise be ideal and we may be required to relinquish rights to some of our technologies, product candidates or our companion diagnostic, or otherwise agree to terms unfavorable to us, any of which may have a material adverse effect on our business, operating results and prospects.

If we are unable to obtain funding on a timely basis, we may be required to significantly curtail, delay or discontinue one or more of our research or development programs or the commercialization of any approved

products or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially adversely affect our business, financial condition and results of operations.

Raising additional funds through debt or equity financing could be dilutive and may cause the market price of our common stock to decline.

To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of those securities could result in substantial dilution for our current stockholders and the terms may include liquidation or other preferences that adversely affect the rights of our current stockholders. Furthermore, the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our common stock to decline and existing stockholders may not agree with our financing plans or the terms of such financings. Moreover, the incurrence of debt financing could result in a substantial portion of our operating cash flow being dedicated to the payment of principal and interest on such indebtedness and could impose restrictions on our operations, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Additional funding may not be available to us on acceptable terms, or at all.

Risks Related to the Discovery and Development of our Product Candidates and Companion Diagnostic

We are highly dependent on the success of MYDICAR and we may not be able to successfully obtain regulatory or marketing approval for, or successfully commercialize, this product candidate.

To date, we have expended significant time, resources and effort on the development of MYDICAR for the treatment of systolic heart failure, including conducting preclinical studies and clinical trials. Although we are in preclinical development of MYDICAR for the treatment of diastolic heart failure and our small molecule product candidates are in preclinical development for the treatment of diabetes and neurodegenerative diseases, our ability to generate product revenues and to achieve commercial success in the near term will initially depend almost entirely on our ability to successfully develop, obtain regulatory approval for and then successfully commercialize MYDICAR for the treatment of systolic heart failure in the United States and the European Economic Area, or EEA. Before we can market and sell MYDICAR in the United States or foreign jurisdictions, we will need to commence and complete additional clinical trials, manage clinical and manufacturing activities, obtain necessary regulatory approvals from the FDA in the United States, from the EMA in the EEA, and from other foreign regulatory authorities in other jurisdictions for both MYDICAR and its companion diagnostic, obtain manufacturing supply, build a commercial organization or enter into a marketing collaboration with a third party, and in some jurisdictions, obtain reimbursement authorization, among other things. We cannot assure you that we will be able to successfully complete the necessary clinical trials and/or obtain regulatory approvals and sufficient commercial manufacturing supply for MYDICAR. To date, no gene therapy product has ever been approved in the United States. If we do not receive regulatory approvals, our business, prospects, financial condition and results of operations will be adversely affected. Even if we obtain regulatory approvals, we may never generate significant revenues from any commercial sales of MYDICAR. If we fail to successfully commercialize MYDICAR, we may be unable to generate sufficient revenues to sustain and grow our business and our business, prospects, financial condition and results of operations will be adversely affected.

MYDICAR is based on a novel technology, which makes it difficult to predict the time and cost of product candidate development and subsequently obtaining regulatory approval. At the moment, no gene therapy product has been approved in the United States and only one gene therapy product has been approved in Europe.

We have primarily concentrated our research and development efforts on our lead product candidate, MYDICAR for the treatment of systolic heart failure, and our future success is highly dependent on the successful development of this product candidate. There can be no assurance that any development problems we experience in the future related to our product candidates will not cause significant delays or unanticipated costs,

or that such development problems can be solved. In addition, our product development program is dependent on the development and commercialization of a required companion diagnostic by us or by third party collaborators. Companion diagnostics are subject to regulation as medical devices and those diagnostic tools must independently be cleared or approved by the FDA, the EMA or other foreign regulatory authorities before we may commercialize our product candidates. We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process or transferring that process to commercial partners, which may prevent us from completing our clinical trials or commercializing our products on a timely or profitable basis, if at all.

In addition, the clinical trial requirements of the FDA, the EMA and other foreign regulatory authorities, and the criteria these regulators use to determine the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of the potential products. The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or extensively studied pharmaceutical or other product candidates. For example, the FDA has required us to conduct a safety and efficacy trial of patients with pre-existing NAbs to the AAV-based vectors used by MYDICAR as well as a viral shedding trial to determine the dissemination of our MYDICAR vector particles into the environment. At the moment, no gene therapy product has been approved in the United States and only one gene therapy product, UniQure's Glybera, which received marketing authorization from the EMA in 2012, has been approved in Europe but has not yet been launched for commercial sale, which makes it difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates in either the United States or Europe. Approvals by the EMA may not be indicative of what the FDA may require for approval.

Regulatory requirements governing gene therapy products have changed frequently and may continue to change in the future. For example, the FDA has established the Office of Cellular, Tissue and Gene Therapies within its Center for Biologics Evaluation and Research, or CBER, to consolidate the review of gene therapy and related products, and the Cellular, Tissue and Gene Therapies Advisory Committee to advise CBER on its review. Gene therapy clinical trials conducted at institutions that receive funding for recombinant DNA research from the U.S. National Institutes of Health, or the NIH, are also subject to review by the NIH Office of Biotechnology Activities' Recombinant DNA Advisory Committee, or the RAC. Although the FDA decides whether individual gene therapy protocols may proceed, the RAC review process can impede the initiation of a clinical trial, even if the FDA has reviewed the trial and approved its initiation. Conversely, the FDA can put an investigational new drug application, or IND, on clinical hold even if the RAC has provided a favorable review. For example, our IND for MYDICAR was placed on clinical hold by the FDA in May 2012 until detailed, updated manufacturing information was submitted and the clinical hold was removed by the FDA in July 2012. Also, before a clinical trial can begin at an NIH-funded institution, that institution's institutional review board, or IRB, and its Institutional Biosafety Committee will have to review the proposed clinical trial to assess the safety of the trial. In addition, adverse developments in clinical trials of gene therapy products conducted by others may cause the FDA, the EMA or other foreign regulatory authorities to change the requirements for approval of any of our gene therapy-based product candidates.

These regulatory review committees and advisory groups, and the new guidelines they promulgate, may lengthen the regulatory review process, require us to perform additional studies, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of these product candidates or lead to significant post-approval limitations or restrictions. As we advance the development of our gene therapy product candidates, we will be required to consult with these regulatory and advisory groups and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of our product candidates. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approvals necessary to bring a potential product to market could decrease our ability to generate sufficient product revenue to maintain our business.

Failure to successfully validate, commercialize and obtain regulatory approval for our companion diagnostic could delay or prevent commercialization of MYDICAR.

A key element of our strategy is to screen out patients with certain amounts of pre-existing NAbs to the AAV1 viral vector used by MYDICAR. We have developed a companion diagnostic that will be used in combination with MYDICAR to help us better identify those patients that may benefit from treatment with MYDICAR. Accordingly, we will be dependent on such companion diagnostic, both during our clinical trials and in connection with any future commercialization of MYDICAR for systolic heart failure or for other indications. We expect that we will enter into a strategic alliance with a third party for the automation and commercialization of our companion diagnostic. We and any of our future collaborators may encounter difficulties in developing the companion diagnostic for commercial application, including issues in relation to automation, selectivity/specificity, analytical validation, reproducibility, or clinical validation of such companion diagnostic. Companion diagnostics are subject to regulation by the FDA, the EMA and other foreign regulatory authorities as medical devices and require separate regulatory clearance or approval prior to commercialization. In the case of MYDICAR, we anticipate that the FDA will require approval of the companion diagnostic under a medical device pre-market approval, or PMA, application prior to approval and commercialization of MYDICAR, which could delay our ability to commercialize both products. If we or any of our future collaborators fail to obtain regulatory approval of the companion diagnostic or are delayed in receiving such approval, our ability to commercialize MYDICAR would be delayed until such time as regulatory approval is obtained. In addition, our future collaborators may encounter production difficulties that could constrain the supply of the companion diagnostic, and both they and we may have difficulties gaining acceptance of the use of the companion diagnostic in the clinical community.

We may find it difficult to enroll patients in our clinical trials, which could delay or prevent development of our product candidates.

Identifying and qualifying patients to participate in clinical trials of our product candidates is critical to our success. The timing of our clinical trials depends on the speed at which we can recruit patients to participate in testing our product candidates as well as completion of required follow-up periods. If patients are unwilling to participate in our gene therapy trials because of negative publicity from adverse events in the biotechnology or gene therapy industries or for other reasons, including competitive clinical trials for similar patient populations, the timeline for recruiting patients, conducting trials and obtaining regulatory approval of potential products may be delayed. If there are delays in accumulating the required number of clinical events in trials where clinical events are a primary endpoint, such as our CUPID 2 trial, there may be delays in completing the trial. These delays could result in increased costs, delays in advancing our product development, delays in testing the effectiveness of our technology or termination of the clinical trials altogether.

Patient enrollment and completion of clinical trials are affected by factors including:

- severity of the disease under investigation;
- design of the trial protocol;
- size of the patient population;
- eligibility criteria for the trial in question;
- perceived risks and benefits of the product candidate under trial;
- proximity and availability of clinical trial sites for prospective patients;
- availability of competing therapies and clinical trials;
- efforts to facilitate timely enrollment in clinical trials;
- patient referral practices of physicians; and
- ability to monitor patients adequately during and after treatment.

We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics or to complete our clinical trials in a timely manner. For example, one significant obstacle to the timely recruitment and enrollment of a sufficient number of eligible patients in our CUPID 2 trial of MYDICAR is the high prevalence of certain pre-existing NAbs to the viral vector used by MYDICAR, with approximately 50% of potential patients in the United States exhibiting these antibodies. In other countries, such as Poland, the prevalence of pre-existing AAV1 NAbs is significantly higher. These antibodies neutralize the effectiveness of AAV-based vectors, such as MYDICAR, and although we are able to prescreen for the presence of these antibodies, the high prevalence of these antibodies in humans reduces the pool of available trial participants. In addition, because therapy with AAV vectors can cause the body to produce NAbs after as little as one treatment, the pool of available trial participants may also be reduced if AAV vectors are increasingly used to treat heart failure or other conditions.

We plan to seek initial marketing approval for our product candidates in the United States, the EEA, Hungary and Israel. We may not be able to initiate or continue clinical trials if we cannot enroll a sufficient number of eligible patients to participate in the clinical trials required by the FDA, the EMA or other foreign regulatory authorities. Our ability to successfully initiate, enroll and complete a clinical trial in any foreign country is subject to numerous risks unique to conducting business in foreign countries, including:

- difficulty in establishing or managing relationships with contract research organizations, or CROs, and physicians;
- different standards for conducting clinical trials;
- our inability to locate qualified local consultants, physicians and partners; and
- the potential burden of complying with a variety of foreign laws, medical standards and regulatory requirements, including the regulation of pharmaceutical and biotechnology products and treatments.

If we have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay, limit or terminate ongoing or planned clinical trials, any of which would have an adverse effect on our business.

We may encounter substantial delays in our clinical trials or we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.

Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of the product candidates in humans. Clinical testing is expensive, time-consuming and uncertain as to outcome. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical trials can occur at any stage of testing. Events that may prevent successful or timely completion of clinical development include:

- delays in raising, or inability to raise, sufficient capital to fund the planned clinical trials;
- delays in reaching a consensus with regulatory agencies on trial design;
- identifying, recruiting and training suitable clinical investigators;
- delays in reaching agreement on acceptable terms with prospective CROs and clinical trial sites;
- delays in obtaining required IRB approval at each clinical trial site;
- delays in recruiting suitable patients to participate in our clinical trials;
- delays due to changing standard of care for the diseases we are studying;
- adding new clinical trial sites;
- imposition of a clinical hold by regulatory agencies, after an inspection of our clinical trial operations or trial sites;

- failure by our CROs, other third parties or us to adhere to clinical trial requirements;
- catastrophic loss of product due to shipping delays or delays in customs in connection with delivery to foreign countries for use in clinical trials;
- failure to perform in accordance with the FDA's good clinical practices, or GCPs, or applicable regulatory guidelines in other countries;
- delays in the testing, validation, manufacturing and delivery of our product candidates to the clinical sites;
- delays in the approval or commercial scale-up, validation and automation of critical companion diagnostics;
- delays in the manufacture of critical reagents used in any companion diagnostic;
- delays in having patients complete participation in a trial or return for post-treatment follow-up;
- clinical trial sites or patients dropping out of a trial;
- occurrence of serious adverse events associated with the product candidate that are viewed to outweigh its potential benefits; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols.

Any inability to successfully complete preclinical and clinical development could result in additional costs to us or impair our ability to generate revenues from product sales, regulatory and commercialization milestones and royalties. Even though we received Fast Track designation from the FDA in December 2011 for MYDICAR for the treatment of systolic heart failure in NYHA Class III/IV heart failure patients, that designation may not result in faster review or approval, if at all. In addition, if we make manufacturing or formulation changes to our product candidates, we may need to conduct additional studies to bridge our modified product candidates to earlier versions. Clinical trial delays could also shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

If the results of our clinical trials are inconclusive or if there are safety concerns or adverse events associated with our product candidates, we may:

- be delayed in obtaining marketing approval for our product candidates or critical companion diagnostics, if at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to changes in the way the product is administered;
- be required to perform additional clinical trials to support approval or be subject to additional post-marketing testing requirements;
- have regulatory authorities withdraw their approval of the product or impose restrictions on its distribution in the form of a modified risk evaluation and mitigation strategy;
- be subject to the addition of labeling statements, such as warnings or contraindications;
- be sued; or
- experience damage to our reputation.

Our product candidates could potentially cause other adverse events that have not yet been predicted. As described above, any of these events could prevent us from achieving or maintaining market acceptance of our product candidates and impair our ability to commercialize our products.

Success in early clinical trials may not be indicative of results obtained in later trials.

Trial designs and results from previous trials, including the results from our CUPID 1 trial, are not necessarily predictive of our future clinical trial designs or results. Our product candidates may also fail to show the desired safety and efficacy in later stages of clinical development despite having successfully advanced through initial clinical trials.

There is a high failure rate for drugs and biological products proceeding through clinical trials. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in later stage clinical trials even after achieving promising results in earlier stage clinical trials. Data obtained from preclinical and clinical activities are subject to varying interpretations, which may delay, limit or prevent regulatory approval. In addition, regulatory delays or rejections may be encountered as a result of many factors, including changes in regulatory policy during the period of product development.

The results from our CUPID 2 trial may not be sufficiently robust to support the submission of marketing approval for MYDICAR for the treatment of systolic heart failure. Before we submit MYDICAR for marketing approval, the FDA and the EMA may require us to conduct additional clinical trials, or evaluate subjects for an additional follow-up period.

Our CUPID 2 trial, which is a 200-patient, double-blind, placebo-controlled, randomized Phase 2b clinical trial to evaluate the safety and efficacy of MYDICAR to reduce the frequency of and/or delay heart failure-related hospitalizations in persons with systolic heart failure, may not be deemed to be a pivotal trial or may not provide sufficient support for a BLA submission. Although our CUPID 1 trial met its primary safety and efficacy endpoints at six months for high-dose MYDICAR versus placebo and the safety profile from this trial was very favorable, it is still possible that, even if we achieve favorable results in the CUPID 2 trial, the FDA may require us to conduct one or more additional clinical trials, possibly involving a larger sample size or a different clinical trial design, particularly if the FDA does not find the results from the CUPID 2 trial to be sufficiently persuasive to support a BLA submission. The FDA may also require that we conduct a longer follow-up period of subjects treated with our MYDICAR product candidate prior to accepting our BLA submission.

It is possible that the FDA or the EMA may not consider the results of our CUPID 2 trial to be sufficient for approval of MYDICAR for the treatment of systolic heart failure. If the FDA or the EMA requires additional studies, including Phase 3 trials, we would incur increased costs and delays in the marketing approval process, which would require us to expend more resources than we have available. In addition, it is possible that the FDA and the EMA may have divergent opinions on the elements necessary for a successful BLA and MAA, respectively, which may cause us to alter our development, regulatory and/or commercialization strategies.

Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label, or result in significant negative consequences following any potential marketing approval.

As with many pharmaceutical and biological products, treatment with MYDICAR may produce undesirable side effects or adverse reactions or events. Although extensive preclinical safety and biodistribution testing conducted on MYDICAR and other AAV vectors, including the CUPID 1 trial of MYDICAR for systolic heart failure and data from previous clinical trials of other AAV vectors, suggests that MYDICAR will be well tolerated, known adverse side effects that could present with treatment with AAV vectors include an immunologic reaction to the capsid protein or gene at early timepoints after administration. In previous clinical trials involving AAV viral vectors for gene therapy, some subjects experienced serious adverse events, including the development of T-cell response due to immune response against the vector capsid proteins. If our vectors demonstrate a similar effect, or other adverse events, we may be required to halt or delay further clinical development of our product candidates. In addition, theoretical adverse side effects of AAV vectors include replication and spread of the virus to other parts of the body and insertional oncogenesis, which is the process whereby the insertion of a corrected gene near a gene that is important in cell growth or division results in

uncontrolled cell division, also known as cancer, which could potentially enhance the risk of malignant transformation. Potential procedure-related events are similar to those associated with standard coronary intervention procedures, and may include vascular injury (e.g., damage to the femoral, radial, or brachial arteries at the site of vascular access, or damage to the coronary arteries) or myocardial injury. If any such adverse events occur, our clinical trials could be suspended or terminated and the FDA, the EMA or other foreign regulatory authorities could order us to cease further development of or deny approval of our product candidates for any or all targeted indications. The product-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

Even if we complete the necessary preclinical studies and clinical trials, we cannot predict when or if we will obtain regulatory approval to commercialize a product candidate or the approval may be for a more narrow indication than we expect.

We cannot commercialize a product until the appropriate regulatory authorities have reviewed and approved the product candidate and, if applicable, its companion diagnostic, as is the case with MYDICAR. Even if our product candidates demonstrate safety and efficacy in clinical trials, the regulatory agencies may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA advisory committee or other regulatory authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory agency policy during the period of product development, clinical trials and the review process. Regulatory agencies also may approve a treatment candidate for fewer or more limited indications than requested or may grant approval subject to the performance of post-marketing studies. In addition, regulatory agencies may not approve the labeling claims that are necessary or desirable for the successful commercialization of our treatment candidates.

Even if we obtain regulatory approval for a product candidate, our products will remain subject to regulatory scrutiny.

Even if we obtain regulatory approval in a jurisdiction, regulatory authorities may still impose significant restrictions on the indicated uses or marketing of our product candidates, or impose ongoing requirements for potentially costly post-approval studies or post-market surveillance. For example, the holder of an approved BLA is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the BLA. The holder of an approved BLA must also submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Advertising and promotional materials must comply with FDA rules and are subject to FDA review, in addition to other potentially applicable federal and state laws.

In addition, product manufacturers and their facilities are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with good manufacturing practices, or GMP, and adherence to commitments made in the BLA. If we or a regulatory agency discovers previously unknown problems with a product such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions relative to that product or the manufacturing facility, including requiring recall or withdrawal of the product from the market or suspension of manufacturing.

If we fail to comply with applicable regulatory requirements following approval of any of our product candidates, a regulatory agency may:

- issue a warning letter asserting that we are in violation of the law;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;

- suspend any ongoing clinical trials;
- refuse to approve a pending BLA or supplements to a BLA submitted by us;
- seize product; or
- refuse to allow us to enter into supply contracts, including government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenues.

Public opinion and increased regulatory scrutiny of gene therapy and genetic research may impact public perception of our product candidates or adversely affect our ability to conduct our business or obtain regulatory approvals for our product candidates.

Gene therapy remains a novel technology, with no gene therapy product approved to date in the United States and only one gene therapy product approved to date in Europe. Public perception may be influenced by claims that gene therapy is unsafe, and gene therapy may not gain the acceptance of the public or the medical community. In particular, our success will depend upon physicians specializing in the treatment of those diseases that our product candidates target prescribing treatments that involve the use of our product candidates in lieu of, or in addition to, existing treatments they are already familiar with and for which greater clinical data may be available. More restrictive government regulations or negative public opinion could have an adverse effect on our business or financial condition and may delay or impair the development and commercialization of our product candidates or demand for any products we may develop. Adverse events in our clinical trials, even if not ultimately attributable to our product candidates, and the resulting publicity could result in increased governmental regulation, unfavorable public perception, potential regulatory delays in the testing or approval of our potential product candidates, stricter labeling requirements for those product candidates that are approved and a decrease in demand for any such product candidates.

Even if we obtain and maintain approval for MYDICAR from the FDA, we may never obtain approval for MYDICAR outside of the United States, which would limit our market opportunities and adversely affect our business.

Approval in the United States by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority does not ensure approval by regulatory authorities in other foreign countries or by the FDA. Sales of MYDICAR outside of the United States will be subject to foreign regulatory requirements governing clinical trials and marketing approval. Even if the FDA grants marketing approval for a product candidate, comparable regulatory authorities of foreign countries must also approve the manufacturing and marketing of the product candidates in those countries and, if applicable, any required companion diagnostic. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the United States, including additional preclinical studies or clinical trials. In many countries outside the United States, a product candidate must be approved for reimbursement before it can be approved for sale in that country. In some cases, the price that we intend to charge for our products, if approved, is also subject to approval. While we may decide to submit an MAA to the EMA for approval in the EEA, obtaining such approval is a lengthy and expensive process and the EMA has its own procedures for approval of product candidates. Even if a product is approved, the FDA or the EMA, as the case may be, may limit the indications for which the product may be marketed, require extensive warnings on the product labeling or require expensive and time-consuming clinical trials or reporting as conditions of approval. Regulatory authorities in countries outside of the United States and the EEA also have requirements for approval of drug candidates with which we must comply prior to marketing in those countries. Obtaining foreign regulatory approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our products in certain countries.

Further, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries and regulatory approval in one country does not ensure approval in any other country, while a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory approval process in others. Also, regulatory approval for any of our product candidates may be withdrawn. If we fail to comply with the regulatory requirements in international markets and/or receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of MYDICAR will be harmed and our business will be adversely affected.

If approved, MYDICAR or any future products may cause or contribute to adverse medical events that we are required to report to regulatory agencies and if we fail to do so, we could be subject to sanctions that would materially harm our business.

Some participants in our clinical trials have reported adverse effects after being treated with MYDICAR. If we are successful in commercializing MYDICAR or any other products, FDA and foreign regulatory agency regulations require that we report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of our obligation to report would be triggered by the date we become aware of the adverse event as well as the nature of the event. We may fail to report adverse events we become aware of within the prescribed timeframe. We may also fail to appreciate that we have become aware of a reportable adverse event, especially if it is not reported to us as an adverse event or if it is an adverse event that is unexpected or removed in time from the use of our products. If we fail to comply with our reporting obligations, the FDA, the EMA or other foreign regulatory authorities could take action including criminal prosecution, the imposition of civil monetary penalties, seizure of our products, or delay in approval or clearance of future products.

Although we have obtained an SPA for a potential Phase 3 pivotal clinical trial of MYDICAR for the treatment of systolic heart failure, this agreement does not guarantee any particular outcome from regulatory review.

In May 2012, we obtained an SPA from the FDA for a potential Phase 3 pivotal clinical trial of MYDICAR. The FDA's SPA process creates a written agreement between the sponsoring company and the FDA regarding clinical trial design and other clinical trial issues, such as the trial endpoints, that can be used to support approval of a product candidate. The SPA is intended to provide assurance that if the agreed upon clinical trial protocols are followed and the clinical trial endpoints are achieved, the data may serve as the primary basis for an efficacy claim in support of a BLA. However, an SPA is not a guarantee of an approval of a product candidate or any permissible claims about the product candidate. In particular, an SPA agreement is not binding on the FDA if previously unrecognized public health concerns arise during the performance of the clinical trial, if other new scientific concerns regarding product candidate safety or efficacy arise or if the sponsoring company fails to comply with the agreed upon clinical trial protocols. Moreover, an SPA does not address all of the variables and details that may go into planning for or conducting a clinical trial, and any change in the protocol for a clinical trial can invalidate an SPA or require the sponsor to submit an amendment. Although our SPA with the FDA provides that the primary efficacy endpoint of time-to-recurrent heart failure-related hospitalizations in the presence of terminal events (all-cause death, heart transplant and LVAD implantation) is acceptable for a potential Phase 3 pivotal trial of MYDICAR, the SPA specifically provides that the FDA's agreement to this point assumes certain elements, including the acceptance of certain simulation models by the FDA and the validation by the FDA of the software used to implement the statistical model. In June 2013, the FDA advised us that it had concerns regarding the simulation results that we had submitted in favor of the trial model. Later in June 2013, we responded to the FDA and provided it with software for data simulations and analysis supporting our proposed statistical model, however, the FDA may not agree with the sufficiency of our simulation models and software used to implement such models and may request that we use an alternative statistical model.

Notably, CUPID 2 is substantially similar in design to the SPA Phase 3 protocol and uses the same primary efficacy endpoint. However, while we believe that the FDA's agreement in the SPA regarding the trial endpoints will support approval if the CUPID 2 trial is deemed a pivotal trial for purposes of BLA submission, the SPA does not directly apply to the CUPID 2 trial. There can also be no assurance that the FDA will ultimately consider our SPA to be binding, particularly on the CUPID 2 trial that we are conducting. The FDA could assert that additional data, including data obtained through one or more additional clinical trials, may be required to support a regulatory submission. In addition, while an SPA addresses the requirements for submission of a BLA, the results of the related clinical trial may not support FDA approval.

Risks Related to our Reliance on Third Parties

We rely on third parties to conduct some or all aspects of our vector production, product manufacturing, companion diagnostic testing, reagent manufacturing, protocol development, research, and preclinical and clinical testing, and these third parties may not perform satisfactorily.

We do not currently, and do not expect to in the future, independently conduct all aspects of our vector production, product manufacturing, companion diagnostic testing, reagent manufacturing, protocol development, research and monitoring and management of our ongoing preclinical and clinical programs. We currently rely, and expect to continue to rely, on third parties with respect to these items, and control only certain aspects of their activities.

Any of these third parties may terminate their engagements with us at any time. If we need to enter into alternative arrangements, our product candidate or companion diagnostic development activities may be delayed. Our reliance on these third parties for research and development activities, including the conduct of any IND-enabling studies, reduces our control over these activities but does not relieve us of our responsibility to ensure compliance with all required legal, regulatory and scientific standards and any applicable trial protocols. For example, for product candidates that we develop and commercialize on our own, we will remain responsible for ensuring that each of our IND-enabling studies and clinical trials are conducted in accordance with the trial plan and protocols.

If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our studies in accordance with regulatory requirements or our stated study plans and protocols, we may be delayed in completing, or unable to complete, the preclinical studies and clinical trials required to support future IND submissions and approval of our product candidates.

We rely on our manufacturers to purchase from third-party suppliers the materials necessary to produce our product candidates and our companion diagnostic for our clinical trials. There are a small number of suppliers for certain capital equipment and raw materials that we use to manufacture our product candidates and our companion diagnostic. Such suppliers may not sell these raw materials to our manufacturers at the times we need them or on commercially reasonable terms. We do not have any control over the process or timing of the acquisition of these raw materials by our manufacturers. Moreover, we currently do not have any agreements for the commercial production of these raw materials. Although we generally do not begin a clinical trial unless we believe we have a sufficient supply of a product candidate or the reagent for our companion diagnostic to complete the clinical trial, any significant delay in the supply of a product candidate, a diagnostic reagent, or the raw material components thereof for an ongoing clinical trial due to the need to replace a third-party manufacturer could considerably delay completion of our clinical trials, product testing and potential regulatory approval of our product candidates or companion diagnostic. If our manufacturers or we are unable to purchase these raw materials after regulatory approval has been obtained for our product candidates or companion diagnostic, our ability to commercially launch and/or generate revenues from the sale of any of our approved products or companion diagnostic would be impaired. Reliance on third-party manufacturers entails exposure to risks to which we would not be subject if we manufactured the product candidates or companion diagnostic ourselves, including:

- we may be unable to negotiate manufacturing agreements with third parties under commercially reasonable terms;

- reduced control over the manufacturing process for our product candidates and companion diagnostic as a result of using third-party manufacturers for all aspects of manufacturing activities;
- termination or nonrenewal of manufacturing agreements with third parties in a manner or at a time that may be costly or damaging to us or result in delays in the development or commercialization of our product candidates or companion diagnostic; and
- disruptions to the operations of our third-party manufacturers or suppliers caused by conditions unrelated to our business or operations, including the bankruptcy of the manufacturer or supplier.

Any of these events could lead to delays in the development of our product candidates or companion diagnostic, including delays in our clinical trials, or failure to obtain regulatory approval for our product candidates or companion diagnostic, or it could impact our ability to successfully commercialize our current product candidates, companion diagnostic or any future products. Some of these events could be the basis for FDA or other regulatory action, including injunction, recall, seizure or total or partial suspension of production.

We and our contract manufacturers are subject to significant regulation with respect to manufacturing our viral vectors and product candidates. The manufacturing facilities on which we rely may not continue to meet regulatory requirements and have limited capacity.

We currently have a relationship with only one supplier, Lonza Houston, Inc., or Lonza, for the manufacturing of our viral vectors and product candidates for clinical testing purposes, and intend to continue to utilize Lonza as our sole or primary supplier in the future. We also expect to rely upon third parties to produce materials required for the commercial production of our product candidates and companion diagnostic if we succeed in obtaining the necessary regulatory approvals. Because certain of our license agreements place restrictions on our ability to transfer or sublicense our intellectual property rights obtained under such agreements in connection with manufacturing activities, if any supplier we use requires a sublicense of our intellectual property rights for commercial manufacture of our viral vectors, product candidates or companion diagnostic, we may be unable to transfer or sublicense the requisite intellectual property rights, which may negatively impact our supply of our viral vectors, product candidates or companion diagnostic.

All entities involved in the preparation of therapeutic product for clinical trials or commercial sale, including our existing contract manufacturers for our product candidates, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in late-stage clinical trials must be manufactured in accordance with GMP and equivalent foreign standards. These regulations govern manufacturing processes and procedures (including record keeping) and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of adventitious agents or other contaminants, or to inadvertent changes in the properties or stability of our product candidates that may not be detectable in final product testing. We or our contract manufacturers must supply all necessary documentation in support of a BLA on a timely basis and must adhere to the FDA's good laboratory practices, or GLPs, and GMP regulations enforced by the FDA through its facilities inspection program. Any failure by our third-party manufacturers to comply with GMP or failure to scale-up manufacturing processes, including any failure to deliver sufficient quantities of product candidates in a timely manner, could lead to a delay in, or failure to obtain, regulatory approval of any of our product candidates. Our facilities and quality systems and the facilities and quality systems of some or all of our third-party contractors must also pass a pre-approval inspection for compliance with the applicable regulations as a condition of regulatory approval of our product candidates or any of our other potential products. In addition, the regulatory authorities may, at any time, audit or inspect a manufacturing facility involved with the preparation of our product candidates or our other potential products or the associated quality systems for compliance with the regulations applicable to the activities being conducted. If these facilities and quality systems do not pass a pre-approval plant inspection, FDA approval of our product candidates, or the equivalent approvals in other jurisdictions, will not be granted.

Regulatory authorities also may, at any time following approval of a product for sale, audit our manufacturing facilities or those of our third-party contractors. If any such inspection or audit identifies a failure to comply with applicable regulations or if a violation of our product specifications or applicable regulations occurs independent of such an inspection or audit, we or the relevant regulatory authority may require remedial measures that may be costly and/or time-consuming for us or a third party to implement and that may include the temporary or permanent suspension of a clinical trial or commercial sales or the temporary or permanent closure of a facility. Any such remedial measures imposed upon us or third parties with whom we contract could materially harm our business.

If we or any of our third-party manufacturers fail to maintain regulatory compliance, the FDA can impose regulatory sanctions including, among other things, refusal to approve a pending application for a new drug product or biological product, or revocation of a pre-existing approval. If any such event occurs, our business, financial condition and results of operations may be materially harmed.

Additionally, if supply from one approved manufacturer is interrupted, there could be a significant disruption in commercial supply. An alternative manufacturer would need to be qualified through a BLA supplement which could result in further delay. The regulatory agencies may also require additional studies if a new manufacturer is relied upon for commercial production. Switching manufacturers may involve substantial costs and would likely result in a delay in our desired clinical and commercial timelines.

These factors could cause the delay of clinical trials, regulatory submissions, required approvals or commercialization of our product candidates, cause us to incur higher costs and prevent us from commercializing our products successfully. Furthermore, if our suppliers fail to meet contractual requirements, and we are unable to secure one or more replacement suppliers capable of production at a substantially equivalent cost, our clinical trials may be delayed or we could lose potential revenue.

We rely on third parties to conduct, supervise and monitor our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

We rely on CROs and clinical trial sites to ensure our clinical trials are conducted properly and on time. While we will have agreements governing their activities, we will have limited influence over their actual performance. We will control only certain aspects of our CROs' activities. Nevertheless, we will be responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards, and our reliance on the CROs does not relieve us of our regulatory responsibilities.

We and our CROs are required to comply with the FDA's GCPs for conducting, recording and reporting the results of clinical trials to assure that the data and reported results are credible and accurate and that the rights, integrity and confidentiality of clinical trial participants are protected. The FDA, the Competent Authorities of the Member States of the EEA, and comparable foreign regulatory authorities, enforce these GCPs through periodic inspections of trial sponsors, principal investigators and clinical trial sites. If we or our CROs fail to comply with applicable GCPs, the clinical data generated in our future clinical trials may be deemed unreliable and the FDA, the EMA, or other foreign regulatory authorities may require us to perform additional clinical trials before approving any marketing applications. Upon inspection, the FDA may determine that our clinical trials did not comply with GCPs. In addition, our future clinical trials will require a sufficient number of test subjects to evaluate the safety and effectiveness of our product candidates. Accordingly, if our CROs fail to comply with these regulations or fail to recruit a sufficient number of patients, we may be required to repeat such clinical trials, which would delay the regulatory approval process.

Our CROs are not our employees, and we are therefore unable to directly monitor whether or not they devote sufficient time and resources to our clinical and nonclinical programs. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting

clinical trials or other product development activities that could harm our competitive position. If our CROs do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements, or for any other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize, our product candidates. If any such event were to occur, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed.

If any of our relationships with these third-party CROs terminate, we may not be able to enter into arrangements with alternative CROs or to do so on commercially reasonable terms. Further, switching or adding additional CROs involves additional costs and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which could materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We also rely on other third parties to store and distribute our vectors and products for the clinical trials that we conduct. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, if approved, producing additional losses and depriving us of potential product revenue.

We may seek to form strategic alliances in the future with respect to our product candidates or companion diagnostic, and we may not realize the benefits of such alliances.

We may form strategic alliances, create joint ventures or collaborations or enter into licensing arrangements with third parties for the development and commercialization of our product candidates and companion diagnostic. We face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Any delays in entering into new strategic partnership agreements related to our product candidates or companion diagnostic could delay the development and commercialization of our product candidates and reduce their competitiveness even if they reach the market. Moreover, we may not be successful in our efforts to establish a strategic partnership or other collaborative arrangement for any future product candidates or companion diagnostic because the potential partner may consider that our research and development pipeline is insufficiently developed to justify a collaborative effort, or that our product candidates and programs do not have the requisite potential to demonstrate safety and efficacy in the target population. Even if we are successful in establishing such a strategic partnership or collaboration, we cannot be certain that, following such a strategic transaction or license, we will be able to progress the development and commercialization of the applicable product candidates as envisaged, or that we will achieve the revenues that would justify such transaction.

Risks Related to Commercialization of our Product Candidates and Companion Diagnostic

We intend to rely on third parties to produce our viral vectors, product candidates and other key materials and for our companion diagnostic testing, but we have not entered into binding agreements with any such manufacturers to support commercialization. Additionally, these manufacturers do not have experience producing our vectors, product candidates or companion diagnostic materials at commercial levels and may not achieve the necessary regulatory approvals or produce our vectors, products or companion diagnostic materials at the quality, quantities, locations and timing needed to support commercialization.

We have not yet secured manufacturing capabilities for commercial quantities of our small molecule compounds or viral vectors to support commercialization of our product candidates, if approved. Although we intend to rely on third parties for commercialization and have entered into a non-binding letter of intent with Lonza which would serve as the basis for negotiating a binding agreement in the event we commence commercial-scale manufacture of MYDICAR, to date we have only entered into a single clinical-scale

manufacturing agreement with Lonza to support our clinical trials. We may be unable to negotiate a binding agreement with Lonza or with any other suitably qualified third-party manufacturer to support our commercialization activities at commercially reasonable terms.

We are currently developing a scalable manufacturing process for MYDICAR, which we are in the process of transferring to Lonza. There is no guarantee that the scale-up process will be able to be completed without complications or delay. Although we have entered into an agreement for the manufacture of our MYDICAR vector with Lonza for our clinical trials, Lonza may not perform as agreed, may be unable to comply with GMP requirements and with FDA, state and foreign regulatory requirements or may terminate its agreement with us. If Lonza is unable to manufacture our MYDICAR vector in a timely manner, encounters manufacturing difficulties, or otherwise fails to comply with its contractual obligations and we are required to switch to a new manufacturer, we expect that our clinical development timeline would be delayed by at least one year. Moreover, we have not entered into a commercial-scale supply agreement with Lonza and Lonza has not yet manufactured our MYDICAR vector on a commercial scale. Because of the complex nature of our product candidates, Lonza, or any other manufacturer with whom we may enter into an agreement, may not be able to manufacture our product candidates at a cost or in quantities or on timelines necessary for the successful commercialization of our product candidates. If we successfully commercialize any of our product candidates, we may be required to establish large-scale commercial manufacturing capabilities, either independently or with one or more third parties, and there is no guarantee that any such third parties will be able to do this in a timely manner, or at all. In addition, in the event that our product development pipeline increases and matures, we will have a greater need for clinical trial and commercial manufacturing capacity. We have no experience manufacturing pharmaceutical or biological products on a commercial scale and some of our suppliers, including Lonza, would need to increase their scale of production to meet our projected needs for commercial manufacturing of our product candidates, the satisfaction of which may not be met on a timely basis.

Even if we develop a manufacturing process in a timely fashion and successfully transfer it to Lonza or any other third-party vector and product manufacturers, if such third-party manufacturers are unable to produce our viral vectors or product candidates in the necessary quantities, or in compliance with GMP, or in compliance with pertinent regulatory requirements, and within our planned time frame and cost parameters, the development and sales of our products, if approved, may be materially harmed.

We similarly intend to enter into an agreement with a third-party partner for the commercial scale-up, automation and administration of our companion diagnostic. However, we may be unable to enter into such an agreement on favorable terms, or at all.

We may run into technical or scientific issues related to manufacturing or development that we may be unable to resolve in a timely manner or with available funds. In addition, we have not completed the characterization and validation activities necessary for commercial and regulatory approvals. If Lonza or any of our other manufacturing partners does not obtain such regulatory approvals, our commercialization efforts will be harmed. For more information regarding our manufacturing services agreement with Lonza, see “Business—Manufacturing—Manufacturing Services Agreement with Lonza.”

In addition, any significant disruption in our supplier relationships could harm our business. We source key materials from third parties, either directly through agreements with suppliers or indirectly through our manufacturers who have agreements with suppliers. There are a small number of suppliers for certain key materials that are used to manufacture our product candidates and companion diagnostic. Such suppliers may not sell these key materials to our manufacturers at the times we need them or on commercially reasonable terms. We do not have any control over the process or timing of the acquisition of these key materials by our manufacturers. Moreover, we currently do not have any agreements for the commercial production of these key materials.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to market and sell our product candidates or companion diagnostic, if approved, we may be unable to generate any revenues.

We currently do not have an organization for the sales, marketing and distribution of products and the cost of establishing and maintaining such an organization may exceed the cost-effectiveness of doing so. In order to market any products that may be approved, including MYDICAR, we must build our sales, distribution, marketing, managerial and other non-technical capabilities or make arrangements with third parties to perform these services. We have no prior experience in the marketing, sale or distribution of pharmaceutical or diagnostic products and there are significant risks involved in building and managing a sales organization, including our ability to hire, retain, and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. We may enter into strategic partnerships with third parties to commercialize our product candidates or companion diagnostic outside of the United States, including for MYDICAR. We intend to build an internal sales force for the commercialization of MYDICAR in the United States. However, we will also consider the option to enter into strategic partnerships for our product candidates and companion diagnostic in the United States and other geographies where we obtain marketing approval.

Our strategy for MYDICAR is to develop a hospital-directed sales force and/or collaborate with third parties to promote the product to selected cardiologists, heart failure specialists and third-party payors, which number in the thousands in the United States. Some pharmaceutical companies employ groups of sales representatives of much larger scale than we intend to utilize to target their cardiovascular products for the general physician community and third-party payors. We may in the future, choose to align ourselves with collaborators as part of our commercialization strategy, particularly outside of the United States, and our future collaboration partners, if any, may not dedicate sufficient resources to the commercialization of our product candidates or companion diagnostic or may otherwise fail in their commercialization due to factors beyond our control. If we are unable to establish effective collaborations to enable the sale of our product candidates and companion diagnostic to healthcare professionals and in geographical regions, including the United States, that will not be covered by our own marketing and sales force, or if our potential future collaboration partners do not successfully commercialize our product candidates or companion diagnostic, our ability to generate revenues from product sales, including sales of MYDICAR, will be adversely affected.

Building an internal sales force involves many challenges, including:

- recruiting and retaining talented people;
- training employees that we recruit;
- setting the appropriate system of incentives;
- managing additional headcount; and
- integrating a new business unit into an existing corporate architecture.

If we are unable to build our own sales force or negotiate a strategic partnership for the commercialization of MYDICAR or our companion diagnostic in the United States, we may be forced to delay the potential commercialization of MYDICAR, reduce the scope of our sales or marketing activities for MYDICAR or undertake the commercialization activities for MYDICAR at our own expense. If we elect to increase our expenditures to fund commercialization activities ourselves, we will need to obtain additional capital, which may not be available to us on acceptable terms, or at all. If we do not have sufficient funds, we will not be able to bring MYDICAR to market or generate product revenue. We could enter into arrangements with collaborative partners or otherwise at an earlier stage than otherwise would be ideal and we may be required to relinquish rights to some of our technologies, product candidates or our companion diagnostic or otherwise agree to terms unfavorable to us, any of which may have a material adverse effect on our business, operating results and prospects.

If we are unable to establish adequate sales, marketing and distribution capabilities, whether independently or with third parties, we may not be able to generate sufficient product revenue and may not become profitable. We will be competing with many companies that currently have extensive and well-funded marketing and sales operations. Without an internal team or the support of a third party to perform marketing and sales functions, we may be unable to compete successfully against these more established companies.

In addition, there are risks involved with both establishing our own sales and marketing capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force is expensive and time-consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

If the market size for MYDICAR is considerably smaller than we anticipate, it could significantly and negatively impact our business, financial condition and results of operations.

It is very difficult to estimate the future commercial potential of MYDICAR due to factors such as safety and efficacy compared to other available treatments, changing standards of care, third-party payor reimbursement standards, patient and physician preferences, and the availability of competitive alternatives that may emerge. We expect that approximately 50% of such potential patients in the United States will be ineligible for treatment with MYDICAR due to the presence of pre-existing AAV1 NAbs which will neutralize the effectiveness of AAV-based vectors such as MYDICAR. In other countries, such as Poland, the prevalence of pre-existing AAV-resistant antibodies is significantly higher. In addition, just one exposure to an AAV-based treatment such as MYDICAR may cause a patient to produce NAbs. Furthermore, other pharmaceutical companies could develop and receive approval for new AAV-based treatments which could increase the number of patients that exhibit NAbs. We estimate that there are over 400,000 heart failure patients in the United States alone that will be eligible for MYDICAR therapy; however, if the potential eligible patient population is lower than we anticipate, or if considerably more than 50% of potential patients exhibit NAbs, it could significantly and negatively impact our business, financial condition and results of operations.

We face intense competition and rapid technological change and the possibility that our competitors may develop therapies that are more advanced or effective than ours, which may adversely affect our financial condition and our ability to successfully commercialize our product candidates.

We face competition both in the United States and internationally, including from major multinational pharmaceutical companies, biotechnology companies and universities and other research institutions. Some of the pharmaceutical and biotechnology companies we know are developing gene therapies for heart failure that could potentially be competitive with or hinder the uptake of MYDICAR and change the standard of care for heart failure patients. These include Renova Therapeutics, NanoCor Therapeutics, Juventas Therapeutics, VentriNova and Beat BioTherapeutics. In addition, many universities and private and public research institutes are active in our target disease areas.

Many of our competitors have substantially greater financial, technical and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors may succeed in developing, acquiring or licensing on an exclusive basis, products that are more effective or less costly than any product candidate that we may develop, or achieve earlier patent protection, regulatory approval, product commercialization and market penetration than we do. Additionally, technologies developed by our competitors may render our potential product candidates uneconomical or obsolete, and we may not be successful in marketing our product candidates against competitors.

Under the terms of our license agreement with AskBio LLC, or AskBio, we granted AskBio an option to obtain a non-exclusive, worldwide license under certain of our patent rights related to infusion of AAV in the

arteries of the heart to develop, manufacture, use and sell products for the treatment of cardiac diseases. This option includes our currently pending patent application related to a method of treating a cardiovascular disease by infusion of a therapeutic nucleic acid into the coronary circulation over a specified period of time. It does not include our issued patent in this family, which includes claims to the concurrent use of a vasodilating substance such as nitroglycerine. Although the scope of the license granted to AskBio excludes our issued patent and the scope of our anticipated regulatory approvals, there can be no guarantee AskBio will not seek to develop and commercialize a product that is able to compete with MYDICAR.

Even if we are successful in achieving regulatory approval to commercialize a product candidate faster than our competitors, we may face competition from "biosimilars" due to the changing regulatory environment. In the United States, the Biologics Price Competition and Innovation Act of 2009 created an abbreviated approval pathway for biological products that are demonstrated to be "highly similar," or "biosimilar," to or "interchangeable" with an FDA-approved biological product. This new pathway could allow competitors to reference data from biological products already approved after 12 years from the time of approval. In addition, companies may be developing biosimilars in other countries that could compete with our products. If competitors are able to obtain marketing approval for biosimilars referencing our products, our products may become subject to competition from such biosimilars, with the attendant competitive pressure and consequences. Expiration or successful challenge of our applicable patent rights could also trigger competition from other products, assuming any relevant exclusivity period has expired.

Finally, as a result of the expiration or successful challenge of our patent rights, we could face litigation with respect to the validity and/or scope of patents relating to our competitors' products. The availability of our competitors' products could limit the demand, and the price we are able to charge, for any products that we may develop and commercialize.

The commercial success of any current or future gene therapy product candidate will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community.

Ethical, social and legal concerns about gene therapy and genetic research could result in additional regulations restricting or prohibiting the products and processes we may use. Even with the requisite approvals, the commercial success of our gene therapy product candidates will depend in part on the medical community, patients, and third-party payors accepting gene therapy products in general, and our product candidates in particular, as medically useful, cost-effective, and safe. Any product that we bring to the market may not gain market acceptance by physicians, patients, third-party payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable. The degree of market acceptance of these product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the potential efficacy and potential advantages over alternative treatments;
- the clinical indications for which the product candidate is approved;
- with respect to MYDICAR, the approval, availability and market acceptance, coverage and reimbursement for the companion diagnostic;
- the prevalence and severity of any side effects, including any limitations or warnings contained in a product's approved labeling;
- relative convenience and ease of administration;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- acceptance by physicians and patients of the product as a safe and effective treatment;
- the potential and perceived advantages of such product candidate over alternative treatments, especially with respect to patient subsets that we are targeting with such product candidate;

- the existence of other gene therapy products utilizing an AAV vector, which potential patients may elect to take for other indications, thereby causing them to develop NAbs and making them ineligible to take MYDICAR;
- the safety of such product candidate seen in a broader patient group, including its use outside the approved indications;
- the cost of treatment in relation to alternative treatments;
- relative convenience and ease of administration;
- the strength of marketing and distribution support and timing of market introduction of competitive products;
- the effectiveness of our sales and marketing efforts;
- publicity concerning our products or competing products and treatments; and
- sufficient third-party insurance coverage or reimbursement.

Even if a potential product displays a favorable efficacy and safety profile in preclinical studies and clinical trials, market acceptance of the product will not be known until after it is launched. Our efforts to educate the medical community and third-party payors on the benefits of the product candidates may require significant resources and may never be successful. Such efforts to educate the marketplace may require more resources than are required by the conventional technologies marketed by our competitors.

If we are unable to achieve and maintain adequate levels of coverage and reimbursement for MYDICAR, our companion diagnostic or any other product candidates, if approved, on reasonable pricing terms, their commercial success may be severely hindered.

Successful sales of any approved product candidates depend on the availability of adequate coverage and reimbursement from third-party payors. Patients who are prescribed treatments for their conditions and providers performing the prescribed services generally rely on third-party payors to reimburse all or part of the associated healthcare costs. Sales of our product candidates will therefore depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, such as Medicare and Medicaid, private health coverage insurers and other third-party payors. In addition, the market for MYDICAR and any of our other product candidates will depend significantly on access to third-party payors' formularies, or lists of treatments for which third-party payors provide coverage and reimbursement.

Third-party payors, whether foreign or domestic, or governmental or commercial, are developing increasingly sophisticated methods of controlling healthcare costs. In the United States, no uniform policy of coverage and reimbursement for therapeutic products exists among third-party payors. Therefore, coverage and reimbursement for therapeutic products can differ significantly from payor to payor. As a result, the coverage determination process will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that adequate coverage and reimbursement will be obtained. In many foreign countries, a product candidate must be approved for reimbursement before it can be approved for sale in that country, and we may fail to obtain such reimbursement approvals.

In the United States, decisions about Medicare coverage and reimbursement for new medicines are made by the Centers for Medicare & Medicaid Services, or CMS, the agency within the U.S. Department of Health and Human Services responsible for administering the Medicare program. Private payors and other government payors often follow CMS's policies to a substantial degree, making the Medicare determinations particularly significant. It remains uncertain what CMS will decide with respect to reimbursement for fundamentally novel products such as ours, as there is no body of established practices and precedents for these new products. Similarly, outside the United States, we may not succeed in obtaining reimbursement approval from the relevant regulatory authorities.

In addition, coverage decisions may depend upon clinical and economic standards that disfavor new products when more established or lower cost alternatives are already available or subsequently become available. Assuming we obtain coverage for a given product, the resulting reimbursement payment rates might not be adequate or may require co-payments that patients find unacceptably high. Moreover, payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, the Middle Class Tax Relief and Job Creation Act of 2012 requires CMS to reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which in turn will serve as a base for 2014 and subsequent years. CMS also recently proposed to re-examine payment amounts for tests reimbursed under the Medicare clinical laboratory fee schedule due to changes in technology and, in addition, proposed to bundle the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting. The proposals would replace the current methodology and, if adopted, the changes would go into effect January 1, 2014. Levels of reimbursement may be impacted by current and future legislation, regulation or reimbursement policies of third-party payors in a manner that may harm the demand and reimbursement available for our products, including our companion diagnostic, which in turn, could harm our product pricing and sales.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe, Canada, and other countries has and will continue to put pressure on the pricing and usage of our product candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. In general, the prices of medicines under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for medicines, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our product candidates. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenues and profits.

Third-party coverage and reimbursement for MYDICAR or any of our other product candidates for which we may receive regulatory approval may not be available or adequate in either the United States or international markets and may vary substantially from our current assumptions, which could have a material adverse effect on our business, results of operations, financial condition and prospects.

Healthcare reform measures may have a material adverse effect on our business and results of operations.

In the United States, the legislative landscape continues to evolve. In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or the Affordable Care Act, was passed, which has the potential to substantially change health care financing by both governmental and private insurers, and significantly impact the U.S. pharmaceutical industry. The Affordable Care Act, among other things, subjects biological products to potential competition by lower-cost biosimilars, revised the methodology by which rebates owed by manufacturers for covered outpatient drugs under the Medicaid Drug Rebate Program are calculated, increased the minimum Medicaid rebates owed by most manufacturers under the Medicaid Drug Rebate Program, extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals enrolled in Medicaid managed care organizations, subjected manufacturers to new annual fees and taxes for certain branded prescription drugs, and provided incentives to programs that increase the federal government’s comparative effectiveness research.

In addition, other legislative changes have been proposed and adopted in the United States since the Affordable Care Act was enacted. On August 2, 2011, the Budget Control Act of 2011 among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation’s automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of up to 2% per fiscal year. On January 2, 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, or the ATRA,

which, among other things, delayed for another two months the budget cuts mandated by these sequestration provisions of the Budget Control Act of 2011. On March 1, 2013, the President signed an executive order implementing sequestration, and on April 1, 2013, the 2% Medicare payment reductions went into effect. The ATRA also reduced Medicare payments to certain providers, including physicians, hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

If we obtain approval to commercialize our product candidates outside of the United States, a variety of risks associated with international operations could materially adversely affect our business.

If any of our product candidates are approved for commercialization, we may enter into agreements with third parties to market them on a worldwide basis or in more limited geographical regions. We expect that we will be subject to additional risks related to entering into international business relationships, including:

- different regulatory requirements for approval of drugs and biological products in foreign countries;
- reduced protection for intellectual property rights;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- regulations under the U.S. Foreign Corrupt Practices Act and similar foreign anti-corruption laws;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

Risks Related to our Business Operations

Our future success depends on our ability to retain key employees, consultants and advisors and to attract, retain and motivate qualified personnel.

We are highly dependent on the members of our executive team listed under “Management” located elsewhere in this prospectus, the loss of whose services may adversely impact the achievement of our objectives. While we have entered into offer letters with each of our executive officers, any of them could leave our employment at any time, as all of our employees are “at will” employees. Recruiting and retaining other qualified employees, consultants and advisors for our business, including scientific and technical personnel, will also be critical to our success.

Although we have not historically experienced unique difficulties attracting and retaining qualified employees, we could experience such problems in the future. For example, competition for qualified personnel in the biotechnology and pharmaceuticals field is intense due to the limited number of individuals who possess the skills and experience required by our industry. There is currently a shortage of skilled executives in our industry, which is likely to continue. As a result, competition for skilled personnel is intense and the turnover rate can be high. We will need to hire additional personnel as we expand our clinical development and commercial activities.

We may not be able to attract and retain personnel on acceptable terms, or at all, given the competition among numerous pharmaceutical and biotechnology companies for individuals with similar skill sets. In addition, failure to succeed in preclinical studies or clinical trials may make it more challenging to recruit and retain qualified personnel. The inability to recruit or loss of the services of any executive, key employee, consultant or advisor may impede the progress of our research, development and commercialization objectives. Furthermore, to the extent we hire personnel from competitors, we may be subject to allegations that they have been improperly solicited or that they have divulged proprietary or other confidential information, or that their former employers own their research output.

We will need to expand our organization and we may experience difficulties in managing this growth, which could disrupt our operations.

As of September 6, 2013, we had 12 full-time employees. As we mature and expand our research and development and other pre-commercialization activities, we expect to expand our full-time employee base and to hire more consultants and contractors. In addition, we currently plan to commercialize MYDICAR, if approved, using an internal sales force to selected cardiologists, heart failure specialists and third-party payors in the United States. Our management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of additional product candidates. If our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow revenues could be reduced, and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize product candidates and compete effectively will depend, in part, on our ability to effectively manage any future growth.

Our employees, principal investigators, consultants and commercial partners may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of fraudulent conduct or other illegal activity by our employees, independent contractors, principal investigators, consultants, commercial partners and vendors. Misconduct by these parties could include intentional, reckless and/or negligent conduct that fails to: comply with the regulations of the FDA and non-U.S. regulators, provide accurate information to the FDA and non-U.S. regulators, comply with healthcare fraud and abuse laws in the United States and abroad, report financial information or data accurately or disclose unauthorized activities to us. In particular, promotion, sales, marketing and certain business arrangements in the healthcare industry are subject to extensive laws intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Such misconduct could also involve the improper use of information obtained in the course of patient recruitment or clinical trials, which could result in regulatory sanctions and cause serious harm to our reputation. We have adopted a code of business conduct and ethics applicable to all of our employees, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant fines or other sanctions.

We may be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws and health information privacy and security laws. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

If we obtain FDA approval for any of our product candidates and begin commercializing those products in the United States, our operations may be directly, or indirectly through our prescribers, customers and purchasers, subject to various federal and state fraud and abuse laws, including, without limitation, the federal Health Care Program Anti-Kickback Statute and the federal civil and criminal False Claims Acts. These laws may impact, among other things, our proposed promotional, sales, marketing and educational programs. In addition, we may be subject to patient privacy laws by both the federal government and the states in which we conduct our business. The laws that may affect our ability to operate include, but are not limited to:

- the federal Health Care Program Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind in return for, the purchase, recommendation, leasing or furnishing of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid, or other government payers that are false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit a person from knowingly and willfully executing a scheme or from making false or fraudulent statements to defraud any healthcare benefit program, regardless of the payor (e.g., public or private);
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, and as amended again by the final HIPAA omnibus rule, Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules Under HITECH and the Genetic Information Nondiscrimination Act; Other Modifications to HIPAA, published in January 2013, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization by entities subject to the rule, such as health plans, health care clearinghouses and health care providers;
- the federal Food, Drug and Cosmetic Act, or FDCA, which prohibits, among other things, the adulteration or misbranding of drugs and devices;
- federal transparency laws, including the federal Physician Payment Sunshine Act that requires disclosure of payments and other transfers of value provided to physicians and teaching hospitals;
- the Affordable Care Act, and its implementing regulations, which may impact, among other things, reimbursement rates by federal health care programs and commercial insurers; and
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts in certain circumstances, such as specific disease states.

Further, the Affordable Care Act, among other things, amends the intent requirements of the federal Anti-Kickback Statute and the criminal statute governing healthcare fraud. A person or entity can now be found guilty of violating the Anti-Kickback Statute and the federal criminal healthcare fraud statute without actual knowledge of the statute or specific intent to violate it. In addition, the Affordable Care Act provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act.

In addition, there has been a recent trend of increased federal and state regulation of payments and other items of value provided to health care professionals and health care entities. Some states, such as California, Connecticut, Massachusetts and Nevada, mandate implementation of commercial compliance programs. Other states, such as Massachusetts, Minnesota and Vermont, impose restrictions on drug manufacturer marketing practices. Further, some states, such as Massachusetts, Vermont and West Virginia, as well as the District of Columbia, require tracking and reporting of gifts, compensation, other remuneration and items of value provided to health care professionals and health care entities.

If our operations are found to be in violation of any of the health regulatory laws described above or any other laws that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, exclusion from participation in federal health care programs and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our financial results.

We face potential product liability, and, if successful claims are brought against us, we may incur substantial liability and costs. If the use or misuse of our product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to our product candidates, our regulatory approvals could be revoked or otherwise negatively impacted and we could be subject to costly and damaging product liability claims.

The use or misuse of our product candidates in clinical trials and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. There is a risk that our product candidates may induce adverse events. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation;
- initiation of investigations by regulators;
- withdrawal of clinical trial participants;
- costs due to related litigation;
- distraction of management’s attention from our primary business;
- substantial monetary awards to patients or other claimants;
- the inability to commercialize our product candidates;
- product recalls, withdrawals or labeling, marketing or promotional restrictions; and
- decreased demand for our product candidates, if approved for commercial sale.

We carry product liability insurance of $10.0 million per occurrence and a $10.0 million aggregate limit. We believe our product liability insurance coverage is appropriate in light of our current clinical programs; however, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. If and when we obtain marketing approval for product candidates, we intend to expand our insurance coverage to include the sale of commercial products; however, we may be unable to obtain product liability insurance on commercially reasonable terms or in adequate amounts. On occasion, large judgments have been awarded in class action lawsuits based on drugs or medical treatments that had unanticipated adverse effects. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business.

Patients with the diseases targeted by our product candidates are often already in severe and advanced stages of disease and have both known and unknown significant pre-existing and potentially life-threatening health

risks. During the course of treatment, patients may suffer adverse events, including death, for reasons that may be related to our product candidates. Such events could subject us to costly litigation, require us to pay substantial amounts of money to injured patients, delay, negatively impact or end our opportunity to receive or maintain regulatory approval to market our products, or require us to suspend or abandon our commercialization efforts. Even in a circumstance in which we do not believe that an adverse event is related to our products, the investigation into the circumstance may be time-consuming or inconclusive. These investigations may interrupt our sales efforts, delay our regulatory approval process in other countries, or impact and limit the type of regulatory approvals our product candidates receive or maintain. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on our business, financial condition or results of operations.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials, which could cause an interruption of our commercialization efforts, research and development efforts and business operations, environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. Although we believe that the safety procedures utilized by our third-party manufacturers for handling and disposing of these materials generally comply with the standards prescribed by these laws and regulations, we cannot guarantee that this is the case or eliminate the risk of accidental contamination or injury from these materials. In such an event, we may be held liable for any resulting damages and such liability could exceed our resources and state or federal or other applicable authorities may curtail our use of certain materials and/or interrupt our business operations. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions. We do not currently carry biological or hazardous waste insurance coverage.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities.

We may not be successful in our efforts to identify or discover additional product candidates.

The success of our business depends primarily upon our ability to identify, develop and commercialize products based on our gene therapy and small molecule platforms. Although our MYDICAR product candidates are currently in clinical or preclinical development and our small molecule product candidates are in preclinical development, our research programs may fail to identify other potential product candidates for clinical development for a number of reasons. For example, our research methodology may be unsuccessful in identifying potential product candidates or our potential product candidates may be shown to have harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval.

If any of these events occur, we may be forced to abandon our development efforts for a program or programs, which would have a material adverse effect on our business and could potentially cause us to cease

operations. Research programs to identify new product candidates require substantial technical, financial and human resources. We may focus our efforts and resources on potential programs or product candidates that ultimately prove to be unsuccessful.

We may use our financial and human resources to pursue a particular research program or product candidate and fail to capitalize on programs or product candidates that may be more profitable or for which there is a greater likelihood of success.

Because we have limited resources, we may forego or delay pursuit of opportunities with certain programs or product candidates or for indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs for product candidates may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through strategic collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate, or we may allocate internal resources to a product candidate in a therapeutic area in which it would have been more advantageous to enter into a partnering arrangement.

We will incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, as well as rules subsequently implemented by the Securities and Exchange Commission, or SEC, and the NASDAQ Global Market have imposed various requirements on public companies. In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, was enacted. There are significant corporate governance and executive compensation related provisions in the Dodd-Frank Act that require the SEC to adopt additional rules and regulations in these areas such as “say on pay” and proxy access. Recent legislation permits smaller “emerging growth companies” to implement many of these requirements over a longer period and up to five years from the pricing of their initial public offering. We intend to take advantage of this new legislation but cannot guarantee that we will not be required to implement these requirements sooner than budgeted or planned and thereby incur unexpected expenses. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact (in ways we cannot currently anticipate) the manner in which we operate our business. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to incur substantial costs to maintain our current levels of such coverage.

Unfavorable global economic conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. The recent global financial crisis caused extreme volatility and disruptions in the capital and credit markets. A severe or prolonged economic downturn, such as the recent global financial crisis, could result in a variety of risks to our business, including, weakened demand for our product candidates and a decreased ability to raise additional capital when needed on acceptable terms, if at all. This is particularly true in Europe, which is undergoing a continued severe economic crisis. A weak or declining economy could also strain our suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our

services. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

Our business and operations would suffer in the event of system failures.

Despite the implementation of security measures, our internal computer systems and those of our current and any future CROs and other contractors, consultants and potential collaborators are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such material system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we rely on third parties to manufacture our vectors, our product candidates and our companion diagnostic and conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates and any related companion diagnostics could be delayed.

Interruptions in the supply of product or inventory loss may adversely affect our operating results and financial condition.

Our product candidates and companion diagnostic are manufactured and distributed using technically complex processes requiring specialized facilities, highly specific raw materials and other production constraints. The complexity of these processes, as well as strict company and government standards for the manufacture and storage of our products, subjects us to production risks. While product batches released for use in clinical trials or for commercialization undergo sample testing, some defects may only be identified following product release. In addition, process deviations or unanticipated effects of approved process changes may result in these intermediate products not complying with stability requirements or specifications. Most of our product candidates must be stored and transported at temperatures within a certain range. If these environmental conditions deviate, our product candidates' remaining shelf-lives could be impaired or their efficacy and safety could become adversely affected, making them no longer suitable for use. The occurrence or suspected occurrence of production and distribution difficulties can lead to lost inventories, and in some cases product recalls, with consequential reputational damage and the risk of product liability. The investigation and remediation of any identified problems can cause production delays, substantial expense, lost sales and delays of new product launches. Any interruption in the supply of finished products or the loss thereof could hinder our ability to timely distribute our products and satisfy customer demand. Any unforeseen failure in the storage of the product or loss in supply could delay our clinical trials and, if our product candidates are approved, result in a loss of our market share and negatively affect our revenues and operations.

We or the third parties upon whom we depend may be adversely affected by earthquakes or other natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Earthquakes or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects. A majority of our management operates in our principal executive offices located in San Diego, California. If our San Diego offices were affected by a natural or man-made disaster, particularly those that are characteristic of the region, such as wildfires and earthquakes, or other business interruption, our ability to manage our domestic and foreign operations could be impaired, which could materially and adversely affect our results of operations and financial condition. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as the manufacturing facilities

of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business. We currently rely, and intend to rely in the future, on our third-party manufacturer, Lonza, which is located in Houston, Texas, a region that is subject to hurricanes and other extreme weather conditions, to produce our supply of MYDICAR. Our ability to obtain supply of MYDICAR could be disrupted, and our results of operations and financial condition could be materially and adversely affected if the operations of Lonza were affected by a man-made or natural disaster or other business interruption. The ultimate impact of any such events on us, our significant suppliers and our general infrastructure is unknown. For more information regarding our manufacturing services agreement and our non-binding letter of intent with Lonza, see "Business—Manufacturing—Manufacturing Services Agreement with Lonza."

Risks Related to our Intellectual Property

If we are unable to obtain or protect intellectual property rights related to our product candidates and companion diagnostic, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our product candidates and companion diagnostic. The strength of patents in the biotechnology and pharmaceutical field involves complex legal and scientific questions and can be uncertain. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates and companion diagnostic in the United States or in other foreign countries. There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue and even if such patents cover our product candidates or companion diagnostic, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed or invalidated. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our product candidates or companion diagnostic or prevent others from designing around our claims. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

If the patent applications we hold or have in-licensed with respect to our programs, product candidates and companion diagnostic fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our product candidates or companion diagnostic, it could dissuade companies from collaborating with us to develop product candidates, and threaten our ability to commercialize, future products. Several patent applications covering our product candidates and companion diagnostic have been filed recently. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of any product candidates or companion diagnostic that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate and companion diagnostic under patent protection could be reduced. Since patent applications in the United States and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we were the first to file any patent application related to a product candidate or companion diagnostic. Furthermore, if third parties have filed such patent applications, an interference proceeding in the United States can be initiated by a third party to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. In addition, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however the life of a patent, and the protection it affords, is limited. Even if

patents covering our product candidates and companion diagnostic are obtained, once the patent life has expired for a product, we may be open to competition from generic medications.

In addition to the protection afforded by patents, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our product candidates and companion diagnostic discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. However, trade secrets can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with those who have access to our confidential information, including our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors.

Although we expect all of our employees and consultants to assign their inventions to us, and all of our employees, consultants, advisors and any third parties who have access to our proprietary know-how, information or technology to enter into confidentiality agreements, we cannot provide any assurances that all such agreements have been duly executed or that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Misappropriation or unauthorized disclosure of our trade secrets could impair our competitive position and may have a material adverse effect on our business. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret. In addition, others may independently discover our trade secrets and proprietary information. For example, the FDA, as part of its Transparency Initiative, is currently considering whether to make additional information publicly available on a routine basis, including information that we may consider to be trade secrets or other proprietary information, and it is not clear at the present time how the FDA's disclosure policies may change in the future, if at all.

Further, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. If we are unable to prevent material disclosure of the non-patented intellectual property related to our technologies to third parties, and there is no guarantee that we will have any such enforceable trade secret protection, we may not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.

We are a party to a number of license agreements under which we are granted rights to intellectual property that are important to our business and we expect that we may need to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that future license agreements will impose on us, various development, regulatory and/or commercial diligence obligations, payment of milestones and/or royalties and other obligations. If we fail to comply with our obligations under these agreements, or we are subject to a bankruptcy, the licensor may have the right to terminate the license, in which event we would not be able to market products covered by the license. Additionally, several of our existing license agreements are sublicenses from a third party who is not the original licensor of the intellectual property at issue. Under these agreements, we must rely on our licensor to comply with their obligations under the primary license agreements under which such third party obtained rights in the applicable intellectual property, where we may have no

relationship with the original licensor of such rights. If our licensors fail to comply with their obligations under these upstream license agreements, the original third-party licensor may have the right to terminate the original license, which may terminate our sublicense. If this were to occur, we would no longer have rights to the applicable intellectual property unless we are able to secure our own direct license with the owner of the relevant rights, which we may not be able to do at a reasonable cost or on reasonable terms, which may impact our ability to continue to develop and commercialize our product candidates and companion diagnostic incorporating the relevant intellectual property. See "Business—License Agreements" for a description of our license agreements, which includes a description of the termination provisions of these agreements.

As we have done previously, we may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates or companion diagnostic, and we cannot provide any assurances that third-party patents do not exist which might be enforced against our current product candidates or companion diagnostic or future products in the absence of such a license. We may fail to obtain any of these licenses on commercially reasonable terms, if at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates or companion diagnostic, which could materially harm our business and the third parties owning such intellectual property rights could seek either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues. Disputes may arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates or the companion diagnostic, and what activities satisfy those diligence obligations; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates or any related companion diagnostics.

Third-party claims of intellectual property infringement may prevent or delay our development and commercialization efforts.

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions and *inter partes* review proceedings before the U.S. Patent and Trademark Office, or U.S. PTO, and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are pursuing development candidates and our companion diagnostic. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates and companion diagnostic may be subject to claims of infringement of the patent rights of third parties.

Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates and companion diagnostic. Because patent applications can take many years to issue, third parties may have currently pending patent applications which may later result in issued patents that our product candidates or companion diagnostic may infringe, or which such third parties claim are infringed by the use of our technologies. If any third-party patents are held by a court of competent jurisdiction to cover any aspect of the manufacturing process for any of our product candidates or companion diagnostic, any molecules formed during the manufacturing process, or any final product candidate or companion diagnostic, including the formulation or method of use of such product candidate or companion diagnostic, the holders of any such patents may be able to block our ability to commercialize such product candidate or companion diagnostic unless we obtained a license under the applicable patents, or until such patents expire. In any such case, such a license may not be available on commercially reasonable terms or at all.

Parties making claims against us for infringement of their intellectual property rights may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates or any related companion diagnostics. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we could be required to redesign our infringing products or obtain a license from such third party to continue developing and commercializing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms, or at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. It may be impossible to redesign our products and technology, or it may require substantial time and monetary expenditure, which could force us to cease commercialization of one or more of our product candidates or the companion diagnostic, or some of our business operations, which could materially harm our business. In addition, in any such proceeding, we may be required to pay substantial damages, including treble damages and attorneys' fees in the event we are found liable for willful infringement.

We may not be successful in obtaining or maintaining necessary rights to product components and processes for our development pipeline through acquisitions and in-licenses.

Presently we have rights to the intellectual property, through licenses from third parties and under patents that we own, to develop our product candidates and companion diagnostic. Because our programs may involve additional product candidates or companion diagnostics that may require the use of proprietary rights held by third parties, the growth of our business will likely depend in part on our ability to acquire, in-license or use these proprietary rights. In addition, our product candidates and companion diagnostic may require specific formulations to work effectively and efficiently and these rights may be held by others. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify. The licensing and acquisition of third-party intellectual property rights is a competitive area, and companies, which may be more established, or have greater resources than we do, may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates and companion diagnostic. More established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities.

For example, we collaborate with U.S. and foreign academic institutions to accelerate our preclinical research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such right of first negotiation for intellectual property, we may be unable to negotiate a license within the specified time frame or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking our ability to pursue our program.

In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us, either on reasonable terms, or at all. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment, or at all. If we are unable to successfully obtain rights to required third-party intellectual property rights, our ability to commercialize our products, and our business, financial condition and prospects for growth could suffer.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents or the patents of our licensors. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours or our licensors is not valid, is unenforceable and/or is not infringed, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. A third-party defendant may also request post grant review or *inter partes* review by the U.S. PTO of any patent we assert. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly and could put our patent applications at risk of not issuing.

Interference proceedings provoked by third parties or brought by us may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. We may not be able to prevent, alone or with our licensors, misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

The patent protection and patent prosecution for some of our product candidates and companion diagnostic may be dependent on third parties.

While we normally seek to obtain the right to control the prosecution and maintenance of the patents relating to our product candidates and companion diagnostic, there may be times when the filing and prosecution activities for platform technology patents that relate to our product candidates and companion diagnostic are controlled by our licensors. For example, we do not have the right to prosecute and maintain the patent rights licensed to us under agreements with each of The Regents of the University of California, AmpliPhi Biosciences Corporation (including the patent rights sublicensed to us from the University of Pennsylvania, or UPenn), Virovek Incorporation, AskBio and Dr. Martin J. Kaplitt, and our ability to have input into such filing and prosecution activities is limited. If these licensors or any of our future licensors fail to appropriately prosecute and maintain patent protection for patents covering any of our product candidates or companion diagnostic, our ability to develop and commercialize those product candidates and companion diagnostic may be adversely affected and we may not be able to prevent competitors from making, using and selling competing products.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we rely on third parties to manufacture our vectors, product candidates and companion diagnostic, and because we collaborate with various organizations and academic institutions on the advancement of our gene

therapy and small molecule platforms and companion diagnostic, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. For example, any academic institution that we may collaborate with in the future will usually expect to be granted rights to publish data arising out of such collaboration, provided that we are notified in advance and given the opportunity to delay publication for a limited time period in order for us to secure patent protection of intellectual property rights arising from the collaboration, in addition to the opportunity to remove confidential or trade secret information from any such publication. In the future we may also conduct joint research and development programs that may require us to share trade secrets under the terms of our research and development partnerships or similar agreements. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

In September 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law, including provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. The U.S. PTO is currently developing regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, were enacted in March 2013. It is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. Moreover, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

Although we seek to protect our ownership of intellectual property rights by ensuring that our agreements with our employees, collaborators and other third parties with whom we do business include provisions requiring such parties to assign rights in inventions to us, we may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. We may be subject to ownership disputes in the future arising, for example, from conflicting obligations of consultants or others who are involved in developing our product candidates and companion diagnostic. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. We may be subject to ownership disputes in the future arising, for example, from conflicting obligations of consultants or others who are involved in developing our product candidates and companion diagnostic. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the U.S. PTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we employ an outside firm and rely on our outside counsel to pay these fees due to non-U.S. patent agencies. The U.S. PTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market and this circumstance would have a material adverse effect on our business.

Issued patents covering our product candidates and companion diagnostic could be found invalid or unenforceable if challenged in court or the U.S. PTO.

If we or one of our licensing partners initiated legal proceedings against a third party to enforce a patent covering one of our product candidates or companion diagnostic, the defendant could counterclaim that the patent covering our product candidate or companion diagnostic, as applicable, is invalid and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace, and there are numerous ground upon which a third party can assert invalidity or unenforceability of a patent Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover our product candidates or related companion diagnostics. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we, our patent counsel and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates and companion diagnostic. Such a loss of patent protection could have a material adverse impact on our business.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other biotechnology companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the U.S. PTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, or permit us to maintain our competitive advantage. For example:

- others may be able to make gene therapies or small molecule compounds that are similar to our product candidates but that are not covered by the claims of the patents that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to file patent applications covering certain of our inventions;

- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that our pending patent applications will not lead to issued patents;
- issued patents that we own or have exclusively licensed may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable; and
- the patents of others may have an adverse effect on our business.

Should any of these events occur, they could significantly harm our business, results of operations and prospects.

Risks Related to this Offering and Ownership of our Common Stock

The market price of our common stock may be highly volatile, and you may not be able to resell your shares at or above the initial public offering price.

Prior to this offering, there has not been a public market for our common stock. An active trading market for our common stock may not develop following this offering. You may not be able to sell your shares quickly or at the market price if trading in our common stock is not active. The initial public offering price for the shares will be determined by negotiations between us and the representative of the underwriters and may not be indicative of prices that will prevail in the trading market.

The market price of our common stock is likely to be volatile. Our stock price could be subject to wide fluctuations in response to a variety of factors, including the following:

- adverse results or delays in preclinical studies or clinical trials;
- our decision to initiate a clinical trial, not to initiate a clinical trial or to terminate an existing clinical trial;
- unanticipated serious safety concerns related to the use of any of our product candidates;
- reports of adverse events in other gene therapy products or clinical trials of such products;
- inability to obtain additional funding;
- any delay in filing an IND or BLA for any of our product candidates and any adverse development or perceived adverse development with respect to the FDA's review of that IND or BLA;
- failure to obtain regulatory and marketing approvals;
- failure to successfully develop and commercialize our product candidates or companion diagnostic;
- failure to enter into collaborations;
- failure by us or our licensors to prosecute, maintain or enforce our intellectual property rights;
- our dependence on third parties, including CROs as well as our partners that provide us with our companion diagnostic product;
- changes in laws or regulations applicable to future products;
- inability to obtain adequate product supply for our product candidates or companion diagnostic or the inability to do so at acceptable prices;
- adverse regulatory decisions;
- introduction of new products, services or technologies by our competitors;

- failure to meet or exceed financial projections we may provide to the public;
- failure to meet or exceed the financial projections of the investment community;
- the perception of the pharmaceutical industry by the public, legislatures, regulators and the investment community;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- additions or departures of key scientific or management personnel;
- significant lawsuits, including patent or stockholder litigation;
- changes in the market valuations of similar companies;
- overall performance of the equity markets and other factors that may be unrelated to our operating performance or the operating performance of our competitors, including changes in market valuations of similar companies;
- sales of our common stock by us or our stockholders in the future; and
- trading volume of our common stock.

In addition, companies trading in the stock market in general, and the NASDAQ Global Market in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not currently have and may never obtain research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, the trading price for our stock would be negatively impacted. In the event we obtain securities or industry analyst coverage, if any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our clinical trials and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of us or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

An active, liquid trading market for our common stock may not develop.

Prior to this offering, there has not been a public market for our common stock. Although we have applied to list our common stock on the NASDAQ Global Market, an active, liquid trading market for our shares may never develop or be sustained following this offering. If an active market for our common stock does not develop, you may not be able to sell your shares quickly or at the market price. The initial public offering price for the shares will be determined by negotiations between us and representatives of the underwriters and may not be indicative of prices that will prevail in the trading market.

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

Our executive officers, directors, 5% stockholders and their affiliates beneficially owned approximately 99.7% of our voting stock as of August 12, 2013. Based upon the assumed number of shares to be sold in this offering as

set forth on the cover page of this prospectus, upon the closing of this offering, that same group will beneficially own approximately % of our outstanding voting stock, which does not include any effect of these stockholders purchasing additional shares in this offering. Therefore, even after this offering these stockholders will have the ability to influence us through this ownership position. These stockholders may be able to determine all matters requiring stockholder approval. For example, these stockholders, acting together, may be able to control elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may believe are in your best interest as one of our stockholders.

We are an "emerging growth company," and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies," including exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley Act), reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least $1.0 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeded $700.0 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company" which would allow us to take advantage of many of the same exemptions from disclosure requirements including exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Our quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

We expect our operating results to be subject to quarterly fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- variations in the level of expenses related to our product candidates, companion diagnostic or future development programs;
- if any of our product candidates receives regulatory approval, the level of underlying demand for these product candidates and wholesalers' buying patterns;
- addition or termination of clinical trials or funding support;
- our execution of any collaborative, licensing or similar arrangements, and the timing of payments we may make or receive under these arrangements.
- any intellectual property infringement lawsuit in which we may become involved;

- regulatory developments affecting our product candidates or companion diagnostic or those of our competitors; and

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act, or the subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our consolidated financial statements or identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our common stock.

If you purchase our common stock in this offering, you will incur immediate and substantial dilution in the book value of your shares.

Investors purchasing common stock in this offering will pay a price per share that substantially exceeds the pro forma as adjusted net tangible book value (deficit) per share as of June 30, 2013. Net tangible book value (deficit) is our tangible assets after subtracting our liabilities. As a result, investors purchasing common stock in this offering will incur immediate dilution of $ per share, based on an assumed initial public offering price of $ per share, the mid-point of the price range set forth on the cover page of this prospectus, and our pro forma as adjusted net tangible book value (deficit) as of June 30, 2013. For more information on the dilution you may suffer as a result of investing in this offering, see “Dilution.”

This dilution is due to the substantially lower price paid by our investors who purchased shares prior to this offering as compared to the price offered to the public in this offering, and the exercise of stock options granted to our employees. In addition, as of June 30, 2013, options to purchase 16,975,497 shares of our common stock at a weighted-average exercise price of $0.18 per share were outstanding. The exercise of any of these options would result in additional dilution. As a result of the dilution to investors purchasing shares in this offering, investors may receive significantly less than the purchase price paid in this offering, if anything, in the event of our liquidation.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market or the perception that these sales might occur, could depress the market price of our common stock and could impair our ability to raise capital through the sale of additional equity securities. We are unable to predict the effect that sales may have on the prevailing market price of our common stock.

Substantially all of our existing stockholders are subject to lock-up agreements with the underwriters of this offering that restrict the stockholders’ ability to transfer shares of our common stock for 180 days from the date of this prospectus, subject to certain exceptions. The lock-up agreements limit the number of shares of common stock that may be sold immediately following the public offering; however, the underwriters may, in their discretion,

permit our officers, directors and other stockholders who are subject to these lock-up agreements to sell shares prior to the expiration of the lock-up agreements. Subject to certain limitations, including sales volume limitations with respect to shares held by our affiliates, substantially all of our outstanding shares prior to this offering will become eligible for sale upon expiration of the lock-up period, as calculated and described in more detail in the section entitled "Shares Eligible for Future Sale." In addition, shares issued or issuable upon exercise of options and warrants vested as of the expiration of the lock-up period will be eligible for sale at that time. Sales of stock by these stockholders could have a material adverse effect on the trading price of our common stock.

Certain holders of our securities are entitled to rights with respect to the registration of their shares under the Securities Act of 1933, as amended, or the Securities Act, subject to the 180-day lock-up arrangement described above. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.

We expect that significant additional capital will be needed in the future to continue our planned operations. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. These sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders.

Pursuant to our 2013 plan, our management is authorized to grant stock options and other equity-based awards to our employees, directors and consultants. Following this offering, 8,415,000 shares of our common stock will be authorized for issuance pursuant to such equity-based awards. The number of shares available for future grant under the 2013 plan will automatically increase on January 1 of each year by 4% of the total number of shares of our common stock outstanding on December 31 of the preceding calendar year, subject to the ability of our board of directors to take action to reduce the size of the increase in any given year. Pursuant to our 2013 Employee Stock Purchase Plan, or the ESPP, following this offering 2,070,000 shares of our common stock will be authorized for issuance pursuant to purchase rights granted to our employees or to employees of any of our designated affiliates. The number of shares of our common stock reserved for issuance under the ESPP will automatically increase on January 1 of each calendar year by the lesser of 1% of the total number of shares of our common stock outstanding on December 31 of the preceding calendar year and 4,800,000 shares, subject to the ability of our board of directors to take action to reduce the size of the increase in any given year. Currently, we plan to register the increased number of shares available for issuance under the 2013 plan and ESPP each year. Increases in the number of shares available for future grant or purchase may result in additional dilution, which could cause our stock price to decline.

We are at risk of securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biotechnology companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds, including for any of the purposes described in "Use of Proceeds," and you will not have the opportunity as part of your investment decision

to assess whether the net proceeds are being used appropriately. Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their currently intended use. The failure by our management to apply these funds effectively could harm our business. If we do not invest or apply the net proceeds from this offering in ways that enhance stockholder value, we may fail to achieve expected financial results, which could cause our stock price to decline.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

Under Section 382 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change income may be limited. We believe that our most recent private placement and other transactions that have occurred over the past three years have triggered an "ownership change" limitation. While our analysis of the annual limitation is not finalized, based on the preliminary results we estimate that federal and California net operating loss carryforwards of $30.6 million and $31.4 million, respectively, are available and federal and California research and development tax credit carryforwards of zero and $0.9 million, respectively, are available. We may also experience ownership changes in the future as a result of the completion of this offering and subsequent shifts in our stock ownership. As a result, if we earn net taxable income, our ability to use our pre-change net operating loss carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

We have never declared or paid any cash dividends on our common stock. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock.

Provisions in our amended and restated certificate of incorporation and bylaws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us or increase the cost of acquiring us, even if doing so would benefit our stockholders or remove our current management.

Some provisions of our charter documents and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders and may prevent attempts by our stockholders to replace or remove our current management. These provisions include:

- authorizing the issuance of "blank check" preferred stock, the terms of which may be established and shares of which may be issued without stockholder approval;
- limiting the removal of directors by the stockholders;
- creating a staggered board of directors;
- prohibiting stockholder action by written consent, thereby requiring all stockholder actions to be taken at a meeting of our stockholders;
- eliminating the ability of stockholders to call a special meeting of stockholders; and
- establishing advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted upon at stockholder meetings.

These provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, which is responsible for appointing the members of our management. In addition, we are subject to Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from engaging in any of a

broad range of business combinations with an interested stockholder for a period of three years following the date on which the stockholder became an interested stockholder, unless such transactions are approved by our board of directors. This provision could have the effect of delaying or preventing a change of control, whether or not it is desired by or beneficial to our stockholders. Further, other provisions of Delaware law may also discourage, delay or prevent someone from acquiring us or merging with us.

Our employment agreements with our executive officers may require us to pay severance benefits to any of those persons who are terminated under specified circumstances, including in connection with a change of control of us, which could harm our financial condition or results.

Our executive officers are parties to employment agreements that contain change of control and severance provisions providing for severance and other benefits and acceleration of vesting of stock options in the event of a termination of employment under specified circumstances, including in connection with a change of control of us. See “Executive and Director Compensation.” The accelerated vesting of options could result in dilution to our existing stockholders and harm the market price of our common stock. The payment of these severance benefits could harm our financial condition and results. In addition, these potential severance payments may discourage or prevent third parties from seeking a business combination with us.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the sections entitled “Prospectus Summary,” “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Business,” contains forward-looking statements. We may, in some cases, use words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms, and similar expressions that convey uncertainty of future events or outcomes to identify these forward-looking statements. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. Forward-looking statements in this prospectus include, but are not limited to, statements about:

- the success, cost and timing of our product development activities and clinical trials;
- our ability to obtain and maintain regulatory approval for MYDICAR, our companion diagnostic, and any of our future product candidates, and any related restrictions, limitations, and/or warnings in the label of an approved product candidate;
- our ability to obtain funding for our operations, including funding necessary to complete our CUPID 2 clinical trial required to file a BLA and an MAA for MYDICAR for the treatment of systolic heart failure;
- the commercialization of our product candidates and companion diagnostic, if approved;
- our plans to research, develop and commercialize our product candidates and companion diagnostic;
- our ability to attract collaborators with development, regulatory and commercialization expertise;
- future agreements with Lonza and other third parties in connection with the commercialization of MYDICAR, our companion diagnostic and any other approved product;
- the size and growth potential of the markets for our product candidates, and our ability to serve those markets;
- the rate and degree of market acceptance of our product candidates and companion diagnostic;
- regulatory developments in the United States and foreign countries;
- the performance of our third-party suppliers and manufacturers;
- the success of competing therapies that are or may become available;
- our ability to attract and retain key scientific or management personnel;
- the accuracy of our estimates regarding expenses, future revenues, capital requirements and needs for additional financing;
- our expectations regarding the period during which we qualify as an emerging growth company under the JOBS Act;
- our use of the proceeds from this offering; and
- our expectations regarding our ability to obtain and maintain intellectual property protection for our product candidates.

These forward-looking statements reflect our management’s beliefs and views with respect to future events and are based on estimates and assumptions as of the date of this prospectus and are subject to risks and uncertainties. We discuss many of these risks in greater detail under “Risk Factors.” Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. Given these uncertainties, you should not place undue reliance on these forward-looking statements.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in this prospectus by these cautionary statements. Except as required by law, we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise.

USE OF PROCEEDS

We estimate that we will receive net proceeds of approximately $ million (or approximately $ million if the underwriters' option to purchase additional shares is exercised in full) from the sale of the shares of common stock offered by us in this offering, based on an assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Similarly, a one million share increase (decrease) in the number of shares offered by us, as set forth on the cover of this prospectus, would increase (decrease) the net proceeds to us by $ million, assuming the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover of this prospectus), remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The principal purposes of this offering are to obtain additional capital to support our operations, to create a public market for our common stock and to facilitate our future access to the public equity markets. We anticipate that we will use the net proceeds of this offering for the following purposes:

- approximately $ million to fund research and development activities related to MYDICAR for the treatment of systolic heart failure, including internal salaries and external costs related to the completion of our CUPID 2 clinical trial and the initiation of our planned AAV1 NAb positive and viral shedding trials, as well as the development of manufacturing capabilities for the commercial production of MYDICAR, including commercial scale-up and validation and automation of our companion diagnostic;
- approximately $ million to fund research and development activities related to MYDICAR for other indications;
- approximately $ million to fund research and development activities related to our SERCA small molecule program; and
- the remainder to fund working capital and general corporate purposes.

We may also use a portion of the remaining net proceeds to in-license, acquire, or invest in complementary businesses, technologies, products or assets. However we have no current commitments or obligations to do so.

The amount and timing of our actual expenditures will depend upon numerous factors, including the ongoing status and results of our CUPID 2 clinical trial of MYDICAR. Furthermore, we anticipate that we will need to secure additional funding for the further development of MYDICAR, and for the development of any of our other product candidates.

Our expected use of net proceeds from this offering represents our current intentions based upon our present plans and business condition. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering, or the amounts that we will actually spend on the uses set forth above. The amounts and timing of our actual use of the net proceeds will vary depending on numerous factors, including our ability to obtain additional financing, the relative success and cost of our research, preclinical and clinical development programs and whether we are able to enter into future licensing arrangements. As a result, our management will have broad discretion in the application of the net proceeds, and investors will be relying on our judgment regarding the application of the net proceeds of this

offering. In addition, we might decide to postpone or not pursue clinical trials or preclinical activities if the net proceeds from this offering and the other sources of cash are less than expected.

Pending their use, we plan to invest the net proceeds from this offering in short- and intermediate-term, interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings to support our operations and finance the growth and development of our business. We do not intend to pay cash dividends on our common stock for the foreseeable future. Any future determination related to our dividend policy will be made at the discretion of our board of directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements, contractual restrictions, business prospects and other factors our board of directors may deem relevant.

CAPITALIZATION

The following table sets forth our cash, cash equivalents and investments, and our capitalization as of June 30, 2013:

- on an actual basis;
- on a pro forma basis, giving effect to (1) the conversion of all our outstanding convertible preferred stock as of June 30, 2013 into an aggregate of 139,278,610 shares of our common stock in connection with the closing of this offering, and (2) the filing of our amended and restated certificate of incorporation, which will occur immediately prior to the closing of this offering; and
- on a pro forma as adjusted basis, reflecting the pro forma adjustments discussed above and giving further effect to the sale by us of shares of our common stock in this offering at an assumed initial public offering price of $ per share (the mid-point of the range set forth on the cover of this prospectus), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma information below is illustrative only and our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this table together with "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and the related notes appearing elsewhere in this prospectus.

	As of June 30, 2013		
	Actual	Pro Forma	Pro Forma As Adjusted(1)
	(unaudited) (in thousands, except per share data)		
Cash, cash equivalents and investments	$ 27,977	$ 27,977	$
Capitalization:			
Series A-1 redeemable convertible preferred stock, $0.0001 par value: 131,594,871 shares authorized and 127,140,530 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	$ 60,098	$ —	$
Junior preferred stock, $0.0001 par value: 12,138,080 shares authorized, issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	5,450	—	
Stockholders' equity (deficit):			
Preferred stock, $0.0001 par value: no shares authorized, issued or outstanding, actual; 10,000,000 shares authorized and no shares issued or outstanding, pro forma and pro forma as adjusted	—	—	
Common stock, $0.0001 par value: 172,249,444 shares authorized and 11,043,541 shares issued and outstanding, actual; 200,000,000 shares authorized and 150,322,151 shares issued and outstanding, pro forma; 200,000,000 shares authorized and shares issued and outstanding, pro forma as adjusted	1	150	
Additional paid-in capital	61,326	126,725	
Accumulated other comprehensive income	2	2	
Deficit accumulated during the development stage	(100,954)	(100,954)	
Total stockholders' equity (deficit)	(39,625)	25,923	
Total capitalization	$ 25,923	$ 25,923	$

(1) Each $1.00 increase or decrease in the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus) would increase or decrease,

respectively, the amount of cash and cash equivalents, additional paid-in capital and total capitalization by approximately $ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering costs payable by us. Similarly, a one million share increase (decrease) in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) each of cash and cash equivalents and total stockholders' equity (deficit) and total capitalization by $ million, assuming the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus) remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The number of common shares shown in the table above is based on the number of shares of our common stock outstanding as of June 30, 2013, and excludes:

- 16,975,497 shares of common stock issuable upon the exercise of outstanding stock options as of June 30, 2013, at a weighted-average exercise price of $0.18 per share;
- 8,777 shares of common stock issuable upon the exercise of outstanding warrants as of June 30, 2013, at a weighted-average exercise price of $2.94 per share, which outstanding warrants will be automatically cancelled upon the closing of this offering if not previously exercised;
- 2,070,000 shares of common stock reserved for future issuance under the ESPP, which will become effective upon the execution and delivery of the underwriting agreement for this offering; and
- 8,415,000 shares of common stock reserved for future issuance under the 2013 plan, which will become effective upon the execution and delivery of the underwriting agreement for this offering (plus 1,688,678 shares of common stock reserved for issuance under the 2012 plan as of June 30, 2013, which shares will be added to the shares reserved under the 2013 plan upon its effectiveness).

DILUTION

If you invest in our common stock in this offering, your ownership interest will be immediately diluted to the extent of the difference between the initial public offering price per share of our common stock and the pro forma net tangible book value per share of our common stock after this offering.

Our historical net tangible book value (deficit) as of June 30, 2013, was approximately $(39.6) million, or $(3.59) per share of our common stock. Our historical net tangible book value (deficit) is the amount of our total tangible assets less our liabilities and convertible preferred stock which is not included within stockholders' equity (deficit). Historical net tangible book value (deficit) per share is our historical net tangible book value (deficit) divided by the number of shares of common stock outstanding as of June 30, 2013.

Our pro forma net tangible book value as of June 30, 2013, was $25.9 million, or $0.17 per share of common stock. Pro forma net tangible book value gives effect to the conversion of all of our outstanding convertible preferred stock as of June 30, 2013, into an aggregate of 139,278,610 shares of our common stock, which will occur in connection with the closing of this offering.

Pro forma as adjusted net tangible book value is our pro forma net tangible book value (deficit), plus the effect of the sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share (the mid-point of the range set forth on the cover of this prospectus), and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. This amount represents an immediate increase in pro forma as adjusted net tangible book value of $ per share to our existing stockholders, and an immediate dilution of $ per share to new investors participating in this offering.

The following table illustrates this dilution on a per share basis:

Assumed initial public offering price per share, the mid-point of the price range set forth on the cover page of this prospectus		$
Historical net tangible book value (deficit) per share as of June 30, 2013	$(3.59)	
Pro forma increase in net tangible book value per share as of June 30, 2013 attributable to convertible preferred stock conversion	$ 3.76	
Pro forma net tangible book value per share as of June 30, 2013	$ 0.17	
Increase in pro forma net tangible book value per share attributable to investors participating in this offering	$	
Pro forma as adjusted net tangible book value per share after this offering		
		$
Pro forma as adjusted dilution per share to investors participating in this offering		

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus) would increase (decrease) the pro forma as adjusted net tangible book value per share after this offering by approximately $ per share and the dilution per share to investors participating in this offering by approximately $ per share, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Similarly, a one million share increase (decrease) in the number of shares offered by us, as set forth on the cover of this prospectus, would increase (decrease) the pro forma as adjusted net tangible book value per share after this offering by approximately $ and decrease (increase) the dilution per share to investors participating in this offering by approximately $, assuming the assumed initial public offering price of

$ per share (the mid-point of the price range set forth on the cover of this prospectus) remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters exercise in full their option to purchase additional shares of our common stock in this offering, the pro forma as adjusted net tangible book value will increase (decrease) to $ per share, representing an immediate increase in pro forma as adjusted net tangible book value to existing stockholders of $ per share and an immediate decrease (increase) in dilution of $ per share to new investors participating in this offering.

The following table summarizes, on a pro forma as adjusted basis as of June 30, 2013, the number of shares purchased or to be purchased from us, the total consideration paid or to be paid to us, and the average price per share paid or to be paid to us by existing stockholders and investors participating in this offering at an assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover of this prospectus), before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. As the table below shows, investors participating in this offering will pay an average price per share substantially higher than our existing stockholders paid.

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percent	
Existing stockholders before this offering		%	$	%	$
Investors participating in this offering		%		%	
Total		100%	$	100%	$

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover page of this prospectus) would increase (decrease) the total consideration paid by investors participating in this offering, total consideration paid by all stockholders and the average price per share paid by all stockholders by approximately $ million, $ million and $, respectively, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and before deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Similarly, a one million share increase (decrease) in the number of shares offered by us, as set forth on the cover of this prospectus, would increase (decrease) the total consideration paid by investors participating in this offering, total consideration paid by all stockholders and the average price per share paid by all stockholders by approximately $ million, $ million and $, respectively, assuming the assumed initial public offering price of $ per share (the mid-point of the price range set forth on the cover of this prospectus) remains the same, and before deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters exercise in full their option to purchase additional shares of our common stock in this offering, the number of shares of common stock held by existing stockholders will be reduced to % of the total number of shares of common stock to be outstanding after this offering, and the number of shares of common stock held by investors participating in this offering will be further increased to , or % of the total number of shares of common stock to be outstanding after this offering.

The foregoing discussion and tables are based on 150,322,151 shares of common stock outstanding as of June 30, 2013, after giving effect to the conversion of our outstanding convertible preferred stock as of June 30, 2013, into an aggregate of 139,278,610 shares of common stock, and excludes:

- 16,975,497 shares of common stock issuable upon the exercise of outstanding stock options as of June 30, 2013, at a weighted-average exercise price of $0.18 per share;

- 8,777 shares of common stock issuable upon the exercise of outstanding warrants as of June 30, 2013, at a weighted-average exercise price of $2.94 per share, which outstanding warrants will be automatically cancelled upon the closing of this offering if not previously exercised;
- 2,070,000 shares of common stock reserved for future issuance under the ESPP, which will become effective upon the execution and delivery of the underwriting agreement for this offering; and
- 8,415,000 shares of common stock reserved for future issuance under the 2013 plan, which will become effective upon the execution and delivery of the underwriting agreement for this offering (plus 1,688,678 shares of common stock reserved for issuance under the 2012 plan as of June 30, 2013, which shares will be added to the shares reserved under the 2013 plan upon its effectiveness).

Furthermore, we may choose to raise additional capital through the sale of equity or convertible debt securities due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent we issue additional shares of common stock or other equity or convertible debt securities in the future, there will be further dilution to investors participating in this offering.

SELECTED FINANCIAL DATA

The following selected financial data should be read together with our consolidated financial statements and related notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations" appearing elsewhere in this prospectus. The selected financial data in this section are not intended to replace our consolidated financial statements and the related notes. Our historical results are not necessarily indicative of the results that may be expected in the future and results of interim periods are not necessarily indicative of the results for the entire year.

We changed our fiscal year end from June 30 to December 31, effective for the fiscal period ended December 31, 2011. The selected statement of operations data for the fiscal year ended June 30, 2011, the six months ended December 31, 2011 and the year ended December 31, 2012, and the selected balance sheet data as of December 31, 2011 and 2012 are derived from our audited consolidated financial statements appearing elsewhere in this prospectus. The selected statement of operations data for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013 and the selected balance sheet data as of June 30, 2013 are derived from our unaudited consolidated financial statements appearing elsewhere in this prospectus.

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Six Months Ended June 30,		Period from December 21, 2000 (inception) to June 30, 2013
				2012	2013	
				(unaudited)		(unaudited)
			(in thousands, except share and per share data)			
Consolidated Statements of Operations Data:						
Operating expenses:						
Research and development	$ 4,193	$ 1,252	$ 13,314	$ 7,867	$ 7,136	$ 82,253
General and administrative	1,832	920	2,631	1,383	1,328	17,813
Total operating expenses	6,025	2,172	15,945	9,250	8,464	100,066
Loss from operations	(6,025)	(2,172)	(15,945)	(9,250)	(8,464)	(100,066)
Other income (expense)	(965)	(689)	74	(161)	5	(1,138)
Consolidated net loss	(6,990)	(2,861)	(15,871)	(9,411)	(8,459)	(101,204)
Net loss attributable to non-controlling interest	—	—	154	72	96	250
Net loss attributable to Celladon Corporation	(6,990)	(2,861)	(15,717)	(9,339)	(8,363)	(100,954)
Accretion to redemption value of redeemable convertible preferred stock	—	—	(343)	(341)	—	(343)
Change in fair value of non-controlling interest	—	—	(154)	(72)	(3,105)	(3,259)
Net loss attributable to common stockholders	$ (6,990)	$ (2,861)	$ (16,214)	$ (9,752)	$ (11,468)	$ (104,556)
Other comprehensive loss:						
Unrealized gain (loss) on investments	—	—	9	—	(7)	2
Comprehensive loss	$ (6,990)	$ (2,861)	$ (15,862)	$ (9,411)	$ (8,466)	$ (101,202)
Net loss per share attributable to common stockholders, basic and diluted(1)	$ (217.66)	$ (81.56)	$ (1.58)	$ (1.03)	$ (1.04)	
Weighted-average shares outstanding, basic and diluted(1)	32,115	35,079	10,261,532	9,470,930	11,043,541	
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)(1)			$ (0.15)		$ (0.06)	
Pro forma weighted-average shares outstanding, basic and diluted (unaudited)(1)			107,053,441		150,322,151	

(1) See Note 1 to our consolidated financial statements appearing elsewhere in this prospectus for an explanation of the methods used to calculate historical and pro forma basic and diluted net loss per common share attributable to common stockholders and the number of shares used in the computation of the per share amounts.

	As of December 31,		As of June 30,
	2011	2012	2013
		(in thousands)	(unaudited)
Consolidated Balance Sheet Data:			
Cash, cash equivalents and investments	$ 468	$ 35,511	$ 27,977
Working capital (deficit)	(14,835)	31,159	25,860
Total assets	636	35,929	28,386
Redeemable non-controlling interest	—	4,814	—
Redeemable convertible preferred stock	—	52,274	60,098
Convertible preferred stock	56,282	—	—
Junior preferred stock	—	5,450	5,450
Deficit accumulated during the development stage	(76,874)	(92,591)	(100,954)
Total stockholders' deficit	(70,979)	(28,416)	(39,625)

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read in conjunction with "Selected Financial Data" and our consolidated financial statements and related notes included elsewhere in this prospectus. This discussion and analysis and other parts of this prospectus contain forward-looking statements based upon current beliefs, plans and expectations that involve risks, uncertainties and assumptions, such as statements regarding our plans, objectives, expectations, intentions and projections. Our actual results and the timing of selected events could differ materially from those anticipated in these forward-looking statements as a result of several factors, including those set forth under "Risk Factors" and elsewhere in this prospectus. You should carefully read the "Risk Factors" section of this prospectus to gain an understanding of the important factors that could cause actual results to differ materially from our forward-looking statements. Please also see the section entitled "Special Note Regarding Forward-Looking Statements."

Overview

We are a clinical-stage biotechnology company applying our leadership position in the field of calcium dysregulation by targeting SERCA enzymes to develop novel therapies for diseases with tremendous unmet medical needs. Our therapeutic portfolio for diseases characterized by SERCA enzyme deficiency includes both gene therapies and small molecule compounds. We are evaluating our lead product candidate, MYDICAR, in a 200-patient randomized, double-blind, placebo-controlled international Phase 2b trial in patients with systolic heart failure, which we refer to as CUPID 2. We expect to complete enrollment of CUPID 2 in the first quarter of 2014 and announce results in mid-2015. If successful, these results, along with other studies, will form the basis for regulatory submissions for approval with the FDA and the EMA. We also plan to develop MYDICAR for additional indications, including diastolic heart failure, treatment of AV-fistula maturation failure, and PAH, as well as for the treatment of patients with advanced heart failure who are on an LVAD. We hold worldwide rights to MYDICAR and plan to commercialize MYDICAR for all approved heart failure indications using a targeted sales force in the United States focused on selected cardiologists and heart failure specialists who treat the majority of heart failure patients.

We are a development-stage company. To date, we have devoted substantially all of our resources to research and development efforts relating to our product candidates, including conducting clinical trials and developing manufacturing capabilities, in-licensing related intellectual property, providing general and administrative support for these operations and protecting our intellectual property. We do not have any products approved for sale and have not generated any revenue from product sales or other sources. From our inception through June 30, 2013, we have funded our operations primarily through the sales of equity and convertible debt securities totaling approximately $122.9 million.

We have incurred net losses in each year since our inception. Our consolidated net losses were approximately $15.9 million for the year ended December 31, 2012 and approximately $8.5 million for the six months ended June 30, 2013. As of June 30, 2013, we had a deficit accumulated during the development stage of approximately $101.0 million. Substantially all our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations.

We anticipate that our expenses will increase substantially if and as we:

- expand or accelerate our clinical development activities, particularly with respect to our clinical trials of MYDICAR for systolic heart failure, including our ongoing CUPID 2 trial of MYDICAR, our AAV1 NAb positive trial and our viral shedding trial, and our preclinical studies and clinical trials of MYDICAR for the treatment of diastolic heart failure and other indications;

- further develop the manufacturing process for our viral vectors and product candidates, including commercial scale-up, validation and automation of our companion diagnostic;
- seek regulatory and marketing approvals for MYDICAR and any other product candidate that successfully completes clinical trials;
- seek regulatory and marketing approvals for our companion diagnostic;
- establish a sales, marketing and distribution infrastructure in the United States to commercialize any products for which we obtain marketing approval;
- initiate additional preclinical, clinical or other studies for our product candidates;
- expand and accelerate development of our small molecule program in the fields of diabetes and neurodegenerative diseases;
- acquire rights to other product candidates and technologies;
- change or add additional manufacturers or suppliers;
- maintain, expand and protect our intellectual property portfolio;
- continue our research and preclinical development of our product candidates and seek to identify and validate additional product candidates;
- make milestone or other payments under any in-license or collaboration agreement;
- attract and retain skilled personnel;
- create additional infrastructure to support our operations as a public company and our product development and planned future commercialization efforts; and
- experience any delays or encounter issues with any of the above.

We expect to continue to incur significant expenses and increasing losses for at least the next several years. Accordingly, we anticipate that we will need to raise additional capital in addition to the net proceeds from this offering prior to the commercialization of MYDICAR and our companion diagnostic, or any of our other product candidates. Until such time that we can generate meaningful revenue from product sales, if ever, we expect to finance our operating activities through public or private equity or debt financings, government or other third-party funding, marketing and distribution arrangements and other collaborations, strategic alliances and licensing arrangements or a combination of these approaches. In any event, we will require additional capital to obtain regulatory approval for, and to commercialize, our product candidates and companion diagnostic. If we are unable to obtain funding on a timely basis, we may be required to significantly curtail, delay or discontinue one or more of our research or development programs or the commercialization of any approved products or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially adversely affect our business, financial condition and results of operations.

Financial Overview

Research and Development Expenses

To date, we have devoted substantially all of our resources to research and development efforts relating to our product candidates, including conducting clinical trials, developing manufacturing capabilities, in-licensing related intellectual property, providing general and administrative support for these operations and protecting our intellectual property. We recognize research and development expenses as they are incurred. Our research and development expenses consist primarily of:

- salaries and related overhead expenses, which include stock-based compensation and benefits for personnel in research and development functions;

- fees paid to consultants and contract research organizations, or CROs, including in connection with our preclinical studies and clinical trials and other related clinical trial fees, such as for investigator grants, patient screening, laboratory work, clinical trial material management and statistical compilation and analysis;
- costs related to acquiring and manufacturing clinical trial materials, including continued testing such as process validation and stability of drug product;
- costs related to compliance with regulatory requirements; and
- payments related to licensed products and technologies.

From our inception through June 30, 2013, we have incurred approximately $82.3 million in research and development expenses, of which we estimate $76.7 million relates to our development of MYDICAR. We plan to increase our research and development expenses for the foreseeable future as we continue the development of MYDICAR for the treatment of systolic heart failure and other indications and to further advance the development of our other product candidates and companion diagnostic, subject to the availability of additional funding. Our direct research and development expenses consist principally of external costs, such as fees paid to investigators, consultants, central laboratories and CROs, in connection with our clinical trials, and costs related to acquiring and manufacturing clinical trial materials. We typically use our employee and infrastructure resources across multiple research and development programs.

The successful development of our clinical and preclinical product candidates and companion diagnostic is highly uncertain. At this time, we cannot reasonably estimate the nature, timing or costs of the efforts that will be necessary to complete the remainder of the development of any of our clinical or preclinical product candidates or companion diagnostic or the period, if any, in which material net cash inflows from these product candidates may commence. This is due to the numerous risks and uncertainties associated with the development of our product candidates and companion diagnostic, including:

- the uncertainty of the scope, rate of progress and expense of our ongoing, as well as any additional, clinical trials and other research and development activities;
- the potential benefits of our product candidates over other therapies;
- our ability to market, commercialize and achieve market acceptance for any product candidate or companion diagnostic that we are developing or may develop in the future;
- ongoing and future clinical trial results;
- the timing and receipt of any regulatory approvals; and
- the filing, prosecuting, defending and enforcing of patent claims and other intellectual property rights, and the expense of doing so.

A change in the outcome of any of these variables with respect to the development of a product candidate or companion diagnostic could mean a significant change in the costs and timing associated with the development of that product candidate or companion diagnostic. For example, if the FDA, the EMA or other foreign regulatory authorities were to require us to conduct clinical trials beyond those that we currently anticipate will be required for the completion of clinical development of a product candidate or companion diagnostic, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time with respect to the development of that product candidate or companion diagnostic.

MYDICAR

The majority of our research and development resources are currently focused on our ongoing CUPID 2 trial, commercialization and manufacturing preparations, clinical trials and other work needed to submit

MYDICAR for regulatory approval in the United States and Europe. We have incurred and expect to continue to incur significant expense in connection with these efforts, including expenses related to:

- the development of manufacturing capabilities for the commercial production of MYDICAR;
- enrollment and conduct of our CUPID 2 trial of MYDICAR, our AAV NAb positive trial and our viral shedding trial for patients with systolic heart failure;
- the initiation of a clinical trial of MYDICAR in diastolic heart failure; and
- commercial scale-up, validation and automation activities related to our companion diagnostic.

Small Molecules

Our research and development expenses for our small molecule program relate primarily to identification and testing of small molecule SERCA modulators.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related costs for employees in executive, finance and administration, corporate development and administrative support functions, including stock-based compensation expenses and benefits. Other significant general and administrative expenses include accounting and legal services, expenses associated with obtaining and maintaining patents, the cost of various consultants, occupancy costs and information systems costs.

We expect that our general and administrative expenses will increase as we operate as a public company and due to the potential commercialization of our product candidates. We believe that these increases will likely include increased costs for director and officer liability insurance, costs related to the hiring of additional personnel to support product commercialization efforts and increased fees for outside consultants, attorneys and accountants. We also expect to incur increased costs to comply with corporate governance, internal controls, investor relations and disclosures, and similar requirements applicable to public companies.

Other Income (Expense)

Other expense consists primarily of interest charges we incur in periods when we had convertible debt outstanding. Other income consists primarily of interest income earned on our cash, cash equivalents and investments. We expect our interest income to increase following the completion of this offering as we invest the net proceeds from this offering pending their use in our operations.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which we have prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of our consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of our consolidated financial statements, as well as the reported expenses during the reported periods. We evaluate these estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are more fully described in Note 1 to our consolidated financial statements appearing elsewhere in this prospectus, we believe that the following accounting policies related to clinical trial expenses, valuation of stock-based compensation and redeemable non-controlling interest are the most critical for fully understanding and evaluating our financial condition and results of operations.

Clinical Trial Accruals

As part of the process of preparing our consolidated financial statements, we are required to estimate our expenses resulting from our obligations under contracts with vendors and consultants and clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided to us under such contracts. Our clinical trial accrual is dependent upon the timely and accurate reporting of CROs and other third-party vendors.

Our objective is to reflect the appropriate clinical trial expenses in our consolidated financial statements by matching those expenses with the period in which services and efforts are expended. We account for these expenses according to the progress of the trial as measured by patient progression and the timing of various aspects of the trial. We determine accrual estimates through discussion with applicable personnel and outside service providers as to the progress or state of completion of clinical trials, or the services completed. During the course of a clinical trial, we adjust the rate of clinical trial expense recognition if actual results differ from the estimates. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and circumstances known at that time. Although we do not expect that our estimates will be materially different from amounts actually incurred, our understanding of status and timing of services performed relative to the actual status and timing of services performed may vary and may result in our reporting amounts that are too high or too low for any particular period. Through June 30, 2013, there had been no material adjustments to our prior period estimates of accrued expenses for clinical trials. However, due to the nature of estimates, we cannot assure you that we will not make changes to our estimates in the future as we become aware of additional information about the status or conduct of our clinical trials.

Stock-Based Compensation

Stock-based compensation expense represents the grant date fair value of employee stock option grants recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures. For stock option grants with performance-based milestones, the expense is recorded over the remaining service period after the point when the achievement of the milestone is probable or the performance condition has been achieved.

We account for stock options granted to non-employees using the fair-value approach. These options are subject to periodic revaluation over their vesting terms.

We estimate the fair value of our stock options granted to employees and non-employees using the Black-Scholes option pricing model, which requires the input of highly subjective assumptions, including (a) the risk-free interest rate, (b) the expected volatility of our stock, (c) the expected term of the award and (d) the expected dividend yield. Due to the lack of a public market for the trading of our common stock and a lack of company specific historical and implied volatility data, we have based our estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. For these analyses, we have selected companies with comparable characteristics to ours, including enterprise value, risk profiles, position within the industry and with historical share price information sufficient to meet the expected life of the stock-based awards. We compute the historical volatility data using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of our stock-based awards. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available. We have estimated the expected life of the option of our employee stock options using the "simplified" method, whereby, the expected life equals the average of the vesting term and the original contractual term of the option. The risk-free interest rate is based on U.S. Treasury zero-coupon bonds with maturities similar to those of the expected term of the award being valued.

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of employee stock option grants were as follows:

	Year Ended December 31, 2012	Six Months Ended June 30,	
		2012	2013
Risk-free interest rate	2.29%	2.28%	1.06%
Expected volatility	84%	84%	84%
Expected option term (in years)	5.9	5.9	6.1
Expected dividend yield	0.0%	0.0%	0.0%

We granted options to purchase an aggregate of 300 shares of common stock during the fiscal year ended June 30, 2011 and we granted no stock options during the six months ended December 31, 2011.

Determination of the Fair Value of Common Stock

The fair value of the common stock underlying our stock-based awards was determined on each grant date by our board of directors, with input from management. All options to purchase shares of our common stock were intended to be granted with an exercise price per share no less than the fair value per share of our common stock underlying those options on the date of grant, determined in good faith and based on the information known to us on the date of grant. In the absence of a public trading market for our common stock, on each grant date, our board of directors considered various objective and subjective factors, along with input from management, to determine the fair value of our common stock, including:

- the prices of our convertible preferred stock sold to investors in arm's length transactions, and the rights, preferences and privileges of our convertible preferred stock as compared to those of our common stock, including the liquidation preferences of our convertible preferred stock;
- our results of operations, financial position and the status of research and development efforts and achievement of enterprise milestones;
- the composition of, and changes to, our management team and board of directors;
- the lack of liquidity of our common stock as a private company;
- our stage of development and business strategy, and the material risks related to our business and industry;
- external market conditions affecting the life sciences and biotechnology industry sectors; and
- the likelihood of achieving a liquidity event for the holders of our common stock, such as an initial public offering, or IPO, or a sale of our company, given prevailing market conditions.

Our board of directors also considered and relied upon an appraisal of the value of our common stock as of January 31, 2012 that was prepared by an independent third-party valuation specialist using methodologies, approaches and assumptions consistent with the American Institute of Certified Public Accountants, or AICPA, Audit and Accounting Practice Aid Series: *Valuation of Privately Held Company Equity Securities Issued as Compensation*, or the Practice Aid.

The Practice Aid prescribes several valuation approaches for setting the value of an enterprise, such as the cost, income and market approaches, and various methodologies for allocating the value of an enterprise to its common stock. The cost approach establishes the value of an enterprise based on the cost of reproducing or replacing the property, less depreciation and functional or economic obsolescence, if present. The income approach establishes the value of an enterprise based on the present value of future cash flows that are reasonably reflective of our company's future operations, discounting to the present value with an appropriate risk-adjusted discount rate or capitalization rate. The market approach is based on the assumption that the value of an asset is equal to the value of a substitute asset with the same characteristics.

The various methods for allocating the enterprise value across our classes and series of capital stock to determine the fair value of our common stock in accordance with the Practice Aid include the following:

- *Current Value Method.* Under the current value method, once the fair value of the enterprise is established, the value is allocated to the various series of preferred and common stock based on their respective seniority, liquidation preferences or conversion values, whichever is greatest. This method was considered but not utilized in any of the valuations discussed below.
- *Option Pricing Method, or OPM.* Under the OPM, shares are valued by creating a series of call options with exercise prices based on the liquidation preferences and conversion terms of each equity class. The values of the preferred and common stock are inferred by analyzing these options.
- *Probability-Weighted Expected Return Method, or PWERM.* The PWERM is a scenario-based analysis that estimates the value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to us, as well as the economic and control rights of each share class.

There are significant judgments and estimates inherent in the determination of the fair value of our common stock. These judgments and estimates include assumptions regarding our future operating performance, the time to completing an IPO or other liquidity event and the determination of the appropriate valuation methods. If we had made different assumptions, our stock-based compensation expense, net loss and net loss per common share could have been significantly different.

January 31, 2012 Valuation

The valuation analysis as of January 31, 2012 used the back-solve method of the OPM, which derives the implied equity value for one type of equity security from a contemporaneous transaction involving another type of equity security. The OPM back-solve method was applied to solve for the equity value and corresponding value of common stock based on the $0.449 per share price of our Series A-1 preferred stock that was sold in January 2012, which financing was led by an unrelated investor that had not previously invested in our company. The resulting fair value of our common stock was $0.09 per share.

The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceed the value of the liquidation preference at the time of a liquidity event, such as a sale of our company or an IPO, assuming the enterprise has funds available to make a liquidation preference meaningful and collectible by the holders of preferred stock. The common stock is modeled as a call option on the underlying equity value at a predetermined exercise price. In the model, the exercise price is based on a comparison with the total equity value rather than, as in the case of a regular call option, a comparison with a per share stock price. Thus, common stock is considered to be a call option with a claim on the enterprise at an exercise price equal to the remaining value immediately after the preferred stock is liquidated. The option-pricing method uses the Black-Scholes option pricing model to price the call options. This model defines the securities' fair values as functions of the current fair value of a company and uses assumptions such as the anticipated timing of a potential liquidity event and the estimated volatility of the equity securities.

For purposes of the valuation analysis, the time to liquidity was estimated as 4.0 years based on then-current plans and estimates of our board of directors and management regarding a liquidity event. In addition, a 55% discount was applied for lack of marketability, or DLOM, to the value indicated for our common stock based on mathematical models for calculating illiquidity discounts. Because the enterprise value was established relative to the sale price of an illiquid security, the DLOM reflected only an incremental discount for lack of marketability attributed to the illiquidity of the common stock relative to that of the preferred stock. A discount was appropriate because our common stock was unregistered, and the holder of a minority interest in the common stock may not influence the timing of a liquidity event for our company.

June 15, 2012 Grants. On June 15, 2012, our board of directors determined that the fair value of our common stock was $0.09 per share in connection with the grant of stock options, in reliance on the valuation analysis as of January 31, 2012 and the other objective and subjective factors described above. As part of this determination, our board of directors concluded that no significant internal or external value-generating events had taken place since the January 31, 2012 valuation other than our completion of an additional closing of our Series A-1 preferred stock financing in early June 2012, which had been taken into consideration on a probability-weighted basis as part of the January 31, 2012 valuation.

October 5, 2012 Grants. On October 5, 2012, our board of directors determined that the fair value of our common stock was $0.09 per share in connection with the grant of stock options, in reliance on the valuation analysis as of January 31, 2012 and the other objective and subjective factors described above. As part of this determination, our board of directors concluded that no significant internal or external value-generating events had taken place between the June 15, 2012 grant date and the date of these stock option grants.

January 9, 2013 Grants. On January 9, 2013, our board of directors determined that the fair value of our common stock was $0.09 per share in connection with the grant of stock options, in reliance on the valuation analysis as of January 31, 2012 and the other objective and subjective factors described above. As part of this determination, our board of directors concluded that no significant internal or external value-generating events had taken place between the October 5, 2012 grant date and the date of these stock option grants.

April 25, 2013 Grants. On April 25, 2013, our board of directors determined that the fair value of our common stock was $0.09 per share in connection with the grant of stock options, in reliance on the valuation analysis as of January 31, 2012 and the other objective and subjective factors described above. As part of this determination, our board of directors concluded that no significant internal or external value-generating events had taken place between the January 9, 2013 grant date and the date of these stock option grants.

Retrospective Reassessment of Fair Value

As part of the preparation of the financial statements necessary for inclusion in the registration statement related to this offering, we reassessed the fair value of our common stock for each completed period in 2012 and 2013 on a retrospective basis for financial reporting purposes. For purposes of this reassessment, we utilized an appraisal of the value of our common stock as of June 30, 2013 that was prepared by an independent third-party valuation specialist using methodologies, approaches and assumptions consistent with the Practice Aid.

During the three months ended June 30, 2013, our board of directors first considered an IPO, which resulted in a change to both our expected time to a liquidity event and the nature of the expected liquidity event. As a result, the valuation method utilized for the June 30, 2013 valuation was changed to a hybrid OPM and PWERM model in order to compensate for these factors. The hybrid model utilized a 65% probability that we would complete an IPO as of December 31, 2013 and a 35% probability that we would complete a different liquidity event within three years following the valuation date.

For the IPO liquidity event scenario, we used pre-money IPO valuations of recent initial public offerings of biotechnology companies, under the guideline public company market approach, to determine our enterprise value. We then calculated the common stock value on a fully-diluted basis and discounted the common stock value to present value using a cost of capital of 26% and applied a DLOM of 15%. Because the enterprise value in the IPO liquidity event scenario was established relative to the sale price of registered common stock on the eve of public trading, the DLOM reflected only an incremental discount for lack of marketability attributed to the illiquidity of unregistered common stock.

To determine the enterprise value of the other liquidity event scenario, we utilized a market approach that started with the pre-money valuation of our Series A-1 preferred stock financing and adjusted the starting valuation based on changes in the enterprise value of guideline public companies and further adjusted for the expected rate of return on our operating

expenditures. This value was adjusted for our current cash and debt balances. The option pricing method was utilized to allocate the enterprise value to our common stock. It was determined that the option pricing method was the most reliable given the expectation of various potential liquidity outcomes and the difficulty of selecting and supporting appropriate exit values given our early stage of development. To determine the fair value of our common stock a DLOM of 30% was applied based on mathematical models for calculating illiquidity discounts.

The June 30, 2013 valuation yielded a common stock fair value of $0.57 per share. Based on this valuation, we concluded that the stock options granted on April 25, 2013 had an exercise price (which was determined in good faith based on all available information as of the date of grant, rather than based on retrospective analysis) that was different than the reassessed fair value of the common stock at the date of grant. We concluded that the exercise price for the stock options granted on June 15, 2012, October 25, 2012 and January 9, 2013 did not differ from the reassessed fair value of the common stock at the date of grant. We attributed the increase in the reassessed fair value at April 25, 2013 to the significant increase in initial public offering activity in the biotechnology sector during the first quarter of 2013 and the concomitant increases in valuations of pre-IPO companies. We used the reassessed fair value at April 25, 2013 to determine stock-based compensation expense which is recorded in our financial statements.

The following table summarizes by grant date the number of shares of common stock underlying stock options granted from January 1, 2012 through June 30, 2013, as well as the associated per share exercise price and the reassessed fair values per share of our common stock on each grant date:

Grant Date	Number of Common Shares Underlying Options Granted	Exercise Price Per Common Share	Reassessed Fair Value Per Common Share
June 15, 2012	15,491,156	$ 0.09	$ 0.09
October 5, 2012	539,900	0.09	0.09
January 9, 2013	420,000	0.09	0.09
April 25, 2013	450,000	0.09	0.57

Total employee stock-based compensation expense related to unvested stock option grants not yet recognized as of June 30, 2013 was approximately $0.5 million and the weighted-average period over which these grants are expected to vest is 3.0 years.

Based on the assumed initial public offering price of $ per share (the midpoint of the price range set forth on the cover page of this prospectus), the intrinsic value of stock options outstanding as of June 30, 2013 would be $ million, of which $ million and $ million would have been related to stock options that were vested and unvested, respectively, at that date.

Redeemable Non-Controlling Interest

The redeemable non-controlling interest in our subsidiary, Celladon Europe B.V., or Celladon Europe, was created through the issuance of redeemable convertible preferred stock obligations, which have elements similar to a liability instrument and are classified as liabilities in the accompanying consolidated balance sheets at fair value. At each reporting period, we adjust the carrying value of the redeemable non-controlling interest by the net loss attributable to the redeemable non-controlling interest. Any difference between the fair value and the adjusted carrying value of the redeemable non-controlling interest is recorded as an adjustment to additional paid-in capital and presented as a component of net loss attributable to common stockholders in the accompanying consolidated statements of operations. The redeemable non-controlling interest was measured at fair value until June 6, 2013, the date at which all shares in Celladon Europe held by the non-controlling party were converted to shares of our Series A-1 preferred stock, at which time the fair value of the redeemable non-controlling interest was reclassified to redeemable convertible preferred stock.

Other Information

Net Operating Loss Carryforwards

As of December 31, 2012, we had federal and California tax net operating loss carryforwards of approximately $67.9 million and $69.4 million, respectively, which will begin to expire in 2021 and 2018, respectively, unless previously utilized. As of December 31, 2012, we had federal and California research and development tax credit carryforwards of approximately $2.9 million and $1.0 million, respectively. The federal research and development tax credit carryforwards will begin to expire in 2024, unless previously utilized. The California research and development tax credit carryforwards are available indefinitely until utilized.

The future utilization of net operating loss and tax credit carryforwards may be limited due to changes in ownership. In general, if we experience a greater than 50% aggregate change in ownership of certain significant stockholders or groups over a three-year period, or a Section 382 ownership change, utilization of our pre-change net operating loss carryforwards would be subject to an annual limitation under Section 382 of the Internal Revenue Code of 1986, as amended, and similar state laws. The annual limitation is generally determined by multiplying the value of our stock at the time of such ownership change (subject to certain adjustments) by the applicable long-term tax-exempt rate. Such limitations may result in expiration of a portion of the pre-change net operating loss carryforwards before utilization and may be substantial. We believe that our most recent private placement and other transactions that have occurred over the past three years have triggered a Section 382 ownership change limitation. While our analysis of the annual limitation is not finalized, based on the preliminary results we estimate that federal and California net operating loss carryforwards of $30.6 million and $31.4 million, respectively, are available and federal and California research and development tax credit carryforwards of zero and $0.9 million, respectively, are available. We have recorded a valuation allowance for the full amount of the portion of the deferred tax asset related to our net operating loss and research and development tax credit carryforwards. We may also experience ownership changes in the future as a result of the completion of this offering and subsequent shifts in our stock ownership.

JOBS Act

On April 5, 2012, the JOBS Act was enacted. Section 107 of the JOBS Act provides that an “emerging growth company” can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. In other words, an “emerging growth company” can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements provided by the JOBS Act. Subject to certain conditions set forth in the JOBS Act, as an “emerging growth company,” we intend to rely on certain of these exemptions, including without limitation, (1) providing an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and (2) complying with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the consolidated financial statements, known as the auditor discussion and analysis. We will remain an “emerging growth company” until the earliest of (a) the last day of the fiscal year in which we have total annual gross revenues of $1 billion or more, (b) the last day of our fiscal year following the fifth anniversary of the date of the completion of this offering, (c) the date on which we have issued more than $1 billion in non-convertible debt during the previous three years or (d) the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

Results of Operations

Comparison of the Six Months Ended June 30, 2012 and 2013

The following table summarizes our results of operations for the six months ended June 30, 2012 and 2013 (in thousands):

	Six Months Ended June 30,		Increase / (Decrease)
	2012	2013	
Research and development	$ 7,867	$ 7,136	$ (731)
General and administrative	1,383	1,328	(55)
Other income (expense)	(161)	5	166

Research and Development Expenses. Research and development expenses were $7.9 million and $7.1 million for the six months ended June 30, 2012 and 2013, respectively. The decrease of approximately $0.7 million was due primarily to a charge of $3.2 million which occurred during the six months ended June 30, 2012 related to the purchase of intangible assets from AmpliPhi Biosciences Corporation, or AmpliPhi, relating to the development of MYDICAR, offset by an increase of $2.5 million in expenses during 2013 associated with the increase in enrollment of patients in our CUPID 2 clinical trial.

General and Administrative Expenses. General and administrative expenses were $1.4 million and $1.3 million for the six months ended June 30, 2012 and 2013, respectively. The decrease of approximately $0.1 million was due primarily to a reduction in outside legal services due to the completion of the establishment of our European subsidiary, Celladon Europe, and legal costs associated with licensing activities in 2012.

Other Income (Expense). Other income (expense) was $(0.2) million and $5,000 for the six months ended June 30, 2012 and 2013, respectively. The other expense for the six months ended June 30, 2012 consisted primarily of interest expense related to convertible debt that was converted into shares of our capital stock in January 2012.

Comparison of the Six Months Ended December 31, 2011 and the Year Ended December 31, 2012

We changed our fiscal year end from June 30 to December 31, effective for the fiscal period ended December 31, 2011. Consequently, the transitional period ended December 31, 2011 comprises six months only as compared to 12 months during the year ended December 31, 2012.

The following table summarizes our results of operations for the six months ended December 31, 2011 and the year ended December 31, 2012 (in thousands):

	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Increase / (Decrease)
Research and development	$ 1,252	$ 13,314	$ 12,062
General and administrative	920	2,631	1,711
Other income (expense)	(689)	74	763

Research and Development Expenses. Research and development expenses were $1.3 million for the six months ended December 31, 2011 and $13.3 million for the year ended December 31, 2012. On a comparative annualized basis, the increase in research and development expenses during this period was due primarily to start-up activities and the initiation of enrollment of our CUPID 2 clinical trial, an increase in personnel primarily for additional manufacturing and clinical support and related costs, and the purchase of intangible assets from AmpliPhi.

General and Administrative Expenses. General and administrative expenses were $0.9 million for the six months ended December 31, 2011 and $2.6 million for the year ended December 31, 2012. On a comparative

annualized basis, the increase in general and administrative expenses during 2012 was primarily due to the increased use of outside services, including legal and accounting fees associated with the establishment of Celladon Europe and clinical trial agreements.

Other Income (Expense). Other income (expense) was $(0.7) million for the six months ended December 31, 2011 and $0.1 million for the year ended December 31, 2012. The other expense for the six months ended December 31, 2011 consisted primarily of interest expense related to convertible debt that was converted into shares of our capital stock in January 2012.

Comparison of the Year Ended June 30, 2011 and the Six Months Ended December 31, 2011

We changed our fiscal year end from June 30 to December 31, effective for the six months ended December 31, 2011. Consequently, the transitional period ended December 31, 2011 comprises six months only as compared to 12 months during the fiscal year ended June 30, 2011.

The following table summarizes our results of operations for the fiscal year ended June 30, 2011 and the six months ended December 31, 2011 (in thousands):

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Increase / (Decrease)
Research and development	$ 4,193	$ 1,252	$ (2,941)
General and administrative	1,832	920	(912)
Other income (expense)	(965)	(689)	276

Research and Development Expenses. Research and development expenses were $4.2 million for the fiscal year ended June 30, 2011 and $1.3 million for the six months ended December 31, 2011. On a comparative annualized basis, the decrease in research and development expenses during this period was primarily due to a decrease in clinical trial costs, as we completed data collection for our CUPID 1 clinical trial in August 2010.

General and Administrative Expenses. General and administrative expenses were $1.8 million for the fiscal year ended June 30, 2011 and $0.9 million for the six months ended December 31, 2011. On a comparative annualized basis, general and administrative expenses were consistent.

Other Income (Expense). Other income (expense) was $(1.0) million for the fiscal year ended June 30, 2011 and $(0.7) million for the six months ended December 31, 2011. On a comparative annualized basis, the difference consisted primarily of $0.2 million in funding from the qualifying therapeutic discovery project tax credit in the fiscal year ended June 30, 2011, partially offset by a $0.1 million loss on disposal of equipment in this period.

Liquidity and Capital Resources

We have incurred net losses each year since our inception and as of June 30, 2013, we had an accumulated deficit of approximately $101.0 million. We anticipate that we will continue to incur net losses for at least the next several years. We expect that our research and development and general and administrative expenses will continue to increase and, as a result, we will need additional capital to fund our operations, which we may obtain through one or more public or private equity offerings, debt financings, government or other third-party funding, strategic alliances and licensing or collaboration arrangements.

Since our inception through June 30, 2013, we have funded our operations principally through the receipt of funds from the private placement of approximately $122.9 million of our equity and debt securities. As of June 30, 2013, we had cash, cash equivalents and investments of approximately $28.0 million. Cash in excess of immediate requirements is invested in accordance with our investment policy, primarily with a view to liquidity and capital preservation.

The following table shows a summary of our cash flows for the periods indicated (in thousands):

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Six Months Ended June 30, 2012	Six Months Ended June 30, 2013
Net cash provided by (used in):					
Operating activities	$ (5,611)	$ (1,582)	$ (14,637)	$ (8,886)	$(7,348)
Investing activities	35	—	(21,833)	(32)	1,826
Financing activities	4,472	1,450	49,843	49,845	—
	$ (1,104)	$ (132)	$ 13,373	$40,927	$(5,522)

Operating activities. Net cash used in operating activities of $5.6 million during the fiscal year ended June 30, 2011 was primarily a result of our net loss of $7.0 million. The primary difference between our net loss and our cash used in operating activities was $1.1 million of interest accrued on our outstanding convertible debt.

Net cash used in operating activities of $1.6 million during the six months ended December 31, 2011 was primarily a result of our net loss of $2.9 million. The primary difference between our net loss and our cash used in operating activities was $0.7 million of interest accrued on our outstanding convertible debt.

Net cash used in operating activities of $14.6 million during the year ended December 31, 2012 was primarily a result of our net loss of $15.9 million. The primary difference between our net loss and our cash used in operating activities was $0.6 million of changes in our operating assets and liabilities and $0.3 million of stock-based compensation.

Net cash used in operating activities of $8.9 million during the six months ended June 30, 2012 was primarily a result of our net loss of $9.4 million. The primary difference between our net loss and our cash used in operating activities was $0.2 million of changes in our operating assets and liabilities and $0.1 million of stock-based compensation.

Net cash used in operating activities of $7.3 million during the six months ended June 30, 2013 was primarily a result of our net loss of $8.5 million. The primary difference between our net loss and our cash used in operating activities was $0.6 million of changes in our operating assets and liabilities, $0.3 million of stock-based compensation and $0.2 million of interest income related to the amortization of discounts and premiums paid on investment securities.

Investing Activities. We had no significant investing activities during the year ended June 30, 2011 or the six month-periods ended December 31, 2011 and June 30, 2012.

Net cash used in investing activities was $21.8 million during the year ended December 31, 2012 and consisted primarily of the investment of proceeds received from our Series A-1 preferred stock financing.

Net cash provided by investing activities of $1.8 million during the six months ended June 30, 2013 was primarily a result of the net maturities of investments used to fund our operating activities.

Financing Activities. Net cash provided by financing activities of $4.5 million during the year ended June 30, 2011 and $1.5 million during the six months ended December 31, 2011, was primarily a result of proceeds received from the issuance of convertible notes that converted into capital stock in connection with our Series A-1 preferred stock financing.

Net cash provided by financing activities of $49.8 million during the year ended December 31, 2012 and the six months ended June 30, 2012 was primarily a result of proceeds received from our Series A-1 preferred stock financing and related issuance of exchangeable shares. We had no cash flows from financing activities during the six months ended June 30, 2013.

Future Funding Requirements

To date, we have not generated any revenue from product sales. We do not know when, or if, we will generate any revenue from product sales. We do not expect to generate any revenue from product sales unless and until we obtain regulatory approval of MYDICAR and our companion diagnostic and commercialize MYDICAR or any of our other product candidates. At the same time, we expect our expenses to increase in connection with our ongoing development activities, particularly as we continue the research, development and clinical trials of, and seek regulatory approval for, our product candidates and companion diagnostic. Upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. In addition, subject to obtaining regulatory approval of any of our product candidates and companion diagnostic, we expect to incur significant commercialization expenses for product sales, marketing, manufacturing and distribution. We anticipate that we will need additional funding in connection with our continuing operations.

Based upon our current operating plan, we believe that the net proceeds from this offering, together with our existing cash, cash equivalents and short-term investments, will enable us to fund our operations through at least mid-2015. We intend to use the net proceeds from this offering to fund development activities related to MYDICAR for the treatment of systolic heart failure, including developing commercial manufacturing capabilities, internal salaries and external costs related to completion of our CUPID 2 trial, to fund research and development activities related to MYDICAR for other indications, to fund activities related to the commercialization of our companion diagnostic, to fund research and development activities related to our SERCA small molecule program and the remainder to fund working capital, including general operating expenses. See “Use of Proceeds.” We have based our estimates on assumptions that may prove to be wrong, and we may use our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates, we are unable to estimate the amounts of increased capital outlays and operating expenditures necessary to complete the development of our product candidates.

Our future capital requirements will depend on many factors, including:

- the progress, costs, results and timing of our CUPID 2 trial, and the clinical development of MYDICAR for other potential indications;
- the willingness of the FDA to accept CUPID 2, as well as our other completed and planned preclinical studies and clinical trials and other work, as the basis for review and regulatory approval of MYDICAR for the treatment of systolic heart failure and for other potential indications;
- the outcome, costs and timing of seeking and obtaining FDA and any other regulatory approvals;
- the costs associated with securing, establishing and maintaining commercialization and manufacturing capabilities;
- the number and characteristics of product candidates that we pursue, including our product candidates in preclinical development;
- the ability of our product candidates to progress through clinical development successfully;
- our need to expand our research and development activities;
- the costs of acquiring, licensing or investing in businesses, products, product candidates and technologies;
- our ability to maintain, expand and defend the scope of our intellectual property portfolio, including the amount and timing of any payments we may be required to make, or that we may receive, in connection with the licensing, filing, prosecution, defense and enforcement of any patents or other intellectual property rights;
- our need and ability to hire additional management and scientific, medical and sales personnel;

- the effect of competing technological and market developments; and
- our need to implement additional internal systems and infrastructure, including financial and reporting systems.

Until such time that we can generate meaningful revenue from product sales, if ever, we expect to finance our operating activities through public or private equity or debt financings, government or other third-party funding, marketing and distribution arrangements, and other collaborations, strategic alliances and licensing arrangements or a combination of these approaches. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common stockholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through government or other third-party funding, marketing and distribution arrangements or other collaborations, or strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations at December 31, 2012 (in thousands):

	Payments due by period				
	Total	Less than 1 year	1 – 3 Years	3 – 5 Years	More than 5 years
Operating lease obligation relating to facility[1]	$434	$ 67	$187	$180	$ —

(1) Consists of our corporate headquarters lease encompassing 2,270 square feet of office space that expires in November 2017.

In addition to the amounts set forth in the table above, we have payment obligations under license agreements that are contingent upon future events such as our achievement of specified development, regulatory and commercial milestones. In addition, under the terms of these agreements, we are required to make development milestone payments and royalty payments in connection with the sale of products developed under these agreements. As of December 31, 2012, we were unable to estimate the timing or likelihood of achieving the milestones or making future product sales and, therefore, any related payments are not included in the table above.

Additionally, we have entered into an agreement with Lonza for the manufacture of our viral vectors and product candidates for clinical testing purposes, and we have entered and will continue to enter into other contracts in the normal course of business with CROs for clinical trials and with vendors for preclinical research studies and other services and products for operating purposes. These agreements generally provide for termination or cancellation within 180 days or less of notice, and therefore are not included in the table above.

We also have employment agreements with our President and Chief Executive Officer, our Vice President, Finance and Administration, our Vice President, Clinical Operations, our Vice President, Manufacturing and our Vice President, Corporate Development and Investor Relations that require the funding of specific payments, if certain events occur, such as a change of control or the termination of employment without cause. These potential payment obligations, which in the case of our named executive officers, are described in “Executive and Director Compensation—Potential Payments Upon Termination or Change of Control,” are not included in the table above.

Off-Balance Sheet Arrangements

During the periods presented we did not have, nor do we currently have, any off-balance sheet arrangements as defined under the rules of the Securities and Exchange Commission.

Recent Accounting Pronouncements

In February 2013, the Financial Accounting Standards Board, or FASB, issued guidance to provide information about the amounts reclassified out of accumulated other comprehensive income, or AOCI, by component. An entity is required to present, either on the face of the consolidated financial statements or in the notes, significant amounts reclassified out of AOCI by the respective line items of net income, but only if the amount reclassified is required to be reclassified in its entirety in the same reporting period. For amounts that are not required to be reclassified in their entirety to net income, an entity is required to cross-reference to other disclosures that provide additional details about those amounts. On January 1, 2013, we adopted this standard, which had no impact on our financial position or results of operations.

Quantitative and Qualitative Disclosure About Market Risk

Our primary exposure to market risk is interest income sensitivity, which is affected by changes in the general level of U.S. interest rates. Due to the short-term duration of our investment portfolio and the low-risk profile of our investments, we would not expect our operating results or cash flows to be affected to any significant degree by the effect of a sudden change in market interest rates on our investment portfolio. A 10% change in interest rates on June 30, 2013 would not have had a material effect on the fair market value of our portfolio.

We do not believe that our cash, cash equivalents and investments have significant risk of default or illiquidity. While we believe our cash and cash equivalents do not contain excessive risk, we cannot provide absolute assurance that in the future our investments will not be subject to adverse changes in market value. In addition, we maintain significant amounts of cash and cash equivalents at one or more financial institutions that are in excess of federally insured limits.

Our balance sheet as of June 30, 2013 includes cash and cash equivalents of $2.5 million denominated in euros through Celladon Europe. The majority of payments made by Celladon Europe are denominated in euros. We do not participate in any foreign currency hedging activities and we do not have any other derivative financial instruments. We did not recognize any significant exchange rate losses during the year ended December 31, 2012 or the six months ended June 30, 2013. A 10% change in the euro-to-dollar exchange rate on June 30, 2013 would not have had a material effect on our results of operations or financial condition.

Inflation generally affects us by increasing our cost of labor and clinical trial costs. We do not believe that inflation has had a material effect on our results of operations during the periods presented.

BUSINESS

Overview

We are a clinical-stage biotechnology company applying our leadership position in the field of calcium dysregulation by targeting SERCA enzymes to develop novel therapies for diseases with tremendous unmet medical needs. Sarco/endoplasmic reticulum Ca^{2+}-ATPase, or SERCA, enzymes are a family of enzymes that play an integral part in the regulation of intra-cellular calcium in all human cells. Calcium dysregulation is implicated in a number of important and complex medical conditions and diseases, such as heart failure, diabetes and neurodegenerative diseases. Our therapeutic portfolio for diseases characterized by SERCA enzyme deficiency includes both gene therapies and small molecule compounds. MYDICAR, our most advanced product candidate, uses gene therapy to target SERCA2a, which is an enzyme that becomes deficient in patients with heart failure. SERCA2a was scientifically validated as a molecular target for heart failure in the 1990s and became a focus of internal discovery efforts for many large pharmaceutical companies. However, to date, no other company has been successful in targeting SERCA2a using traditional discovery methods. We believe that our approach to modulating SERCA2a overcomes the issues encountered by previous efforts, and our gene therapy approach has the potential to provide transformative disease-modifying effects with long-term benefits in patients with heart failure. In addition, we have identified a number of potential first-in-class compounds addressing novel targets in diabetes and neurodegenerative diseases with our small molecule platform of SERCA2b modulators.

We are the first company to enter clinical development with a product candidate that selectively targets SERCA2a. In a 39-patient randomized, double-blind, placebo-controlled Phase 2a trial in patients with systolic heart failure, which we refer to as CUPID 1, MYDICAR was found to be safe and well-tolerated, reduced heart failure-related hospitalizations, improved patients' symptoms, quality of life and serum biomarkers, and improved key markers of cardiac function predictive of survival, such as end systolic volume. Based on these results, as well as our previous preclinical studies and clinical trials, we advanced MYDICAR to a 200-patient randomized, double-blind, placebo-controlled international Phase 2b trial in patients with systolic heart failure, which we refer to as CUPID 2. We expect to complete enrollment of CUPID 2 in the first quarter of 2014 and announce results in mid-2015. If successful, these results, along with other studies, will form the basis for regulatory submissions for approval with the United States Food and Drug Administration, or FDA, and European Medicines Agency, or EMA. In 2012, we obtained a Special Protocol Assessment, or SPA, whereby the FDA agreed to use time-to-multiple heart failure-related hospitalizations as the primary endpoint for a MYDICAR Phase 3 pivotal trial. Our ongoing CUPID 2 trial uses a similar clinical protocol with identical endpoints as agreed to in the SPA.

MYDICAR utilizes a recombinant adeno-associated viral vector serotype 1, or AAV1, to deliver the gene for the SERCA2a enzyme. We believe AAV1 serotype vectors are particularly well suited for administration to the heart muscle because adeno-associated virus, or AAV, vectors are safe and are less immunogenic than other viral vectors commonly used in gene therapy, reducing the chance for an autoimmune reaction to the cells that take up the virus. Most people are exposed to the wild type AAV during childhood, without experiencing any symptoms because AAV causes no disease. In addition, local delivery of AAV1 to the heart requires extremely small quantities to achieve therapeutic effect, which has contributed to the low incidence of side effects in clinical trials to date. We have developed a companion diagnostic to identify the approximately 50% of patients in the United States who are AAV1 neutralizing antibody, or NAb, negative and therefore eligible for MYDICAR treatment.

According to the American Heart Association, or AHA, there are nearly six million patients currently diagnosed with heart failure in the United States. Despite optimal guideline-directed therapies employing a wide range of pharmacologic, device, and surgical options, many heart failure patients deteriorate over time and the long-term prognosis associated with heart failure is worse than that associated with the majority of cancers, with a mortality rate of approximately 50% at five years following initial diagnosis. There are one million primary

heart failure-related hospitalizations annually in the United States. In 2010, the estimated direct and indirect cost of heart failure in the United States was $39 billion, half of which was related to repeated hospitalizations. The one- and six-month readmission rates after heart failure-related hospitalization are close to 25% and 50%, respectively, and there is growing pressure on hospitals to reduce readmissions for heart failure.

We are initially developing MYDICAR to treat patients with systolic heart failure. Heart failure caused by systolic dysfunction is characterized by a decreased contraction of the heart muscle. We also plan to develop MYDICAR for additional indications, such as diastolic heart failure, arteriovenous, or AV, fistula maturation failure, and pulmonary arterial hypertension, or PAH, as well as for the treatment of patients with advanced heart failure who are on a left-ventricular assist device, or LVAD. AV-fistula maturation failure and PAH are characterized by a SERCA2a deficiency in vascular smooth muscle cells, and MYDICAR has demonstrated potential disease-modifying capability in preclinical models of these diseases.

We hold worldwide rights to MYDICAR and our small molecule platform of SERCA modulators in all indications and markets. We plan to commercialize MYDICAR for all approved heart failure indications using a targeted sales force in the United States focused on selected cardiologists and heart failure specialists who treat the majority of heart failure patients. We believe we can maximize the value of our company by retaining substantial commercialization rights to our product candidates and, where appropriate, entering into partnerships to develop and commercialize certain product candidates in specific therapeutic indications and/or geographic territories.

Strategy

We are committed to apply our first-mover scientific leadership position in the field of SERCA2 enzymes to transform the lives of patients with debilitating, life-threatening diseases or conditions. Each of our ongoing and planned development projects addresses diseases or conditions with high unmet medical need that are characterized by an underlying SERCA2 enzyme deficiency. The core elements of our strategy include:

- ***Successfully develop MYDICAR as a novel, first-in-class therapy for patients with heart failure due to systolic dysfunction.*** Based on positive results from our CUPID 1 trial for MYDICAR, we are conducting our CUPID 2 trial to evaluate the safety and efficacy of MYDICAR to reduce heart failure-related hospitalizations in patients with systolic heart failure. We expect to complete enrollment of this trial in the first quarter of 2014 and announce results from this trial in mid-2015. In the United States alone, several hundreds of thousands of patients with heart failure due to systolic dysfunction currently have a poor prognosis and limited treatment options. We believe MYDICAR, if approved, will become a valuable treatment option for these patients.
- ***Advance MYDICAR through an expedited development and approval process.*** In 2012, we obtained an SPA in the context of a Phase 3 clinical trial protocol whereby the FDA agreed to the use of time-to-multiple heart failure-related hospitalizations as the primary endpoint for a potential pivotal trial of MYDICAR. Our ongoing CUPID 2 trial uses a similar clinical protocol with identical endpoints as agreed to in the SPA. Following the completion of our ongoing CUPID 2 trial, we anticipate that we will have meetings with the FDA and the EMA to discuss whether any remaining clinical trials will be required for approval of MYDICAR. If the FDA or the EMA allows us to pursue an expedited approval process, we anticipate that we will seek registration for MYDICAR upon completion of our CUPID 2 trial and would not conduct the Phase 3 trial outlined in the SPA.
- ***Maximize the value of our MYDICAR franchise by expanding into additional indications.*** The broad therapeutic potential of MYDICAR in multiple indications presents opportunities to maximize the value of our MYDICAR franchise. Beyond our lead proposed indication of systolic heart failure, we also plan to develop MYDICAR for additional indications such as diastolic heart failure, treatment of AV-fistula maturation failure and PAH. Each of these diseases is characterized by a SERCA2a

deficiency and MYDICAR has demonstrated disease-modifying results in preclinical models of these diseases. We plan to initiate a Phase 1/2 trial in 2014 for the treatment of diastolic heart failure with MYDICAR. We may selectively form collaborative alliances to expand and accelerate our development capabilities and product offerings for indications that are poorly managed by existing treatment options.

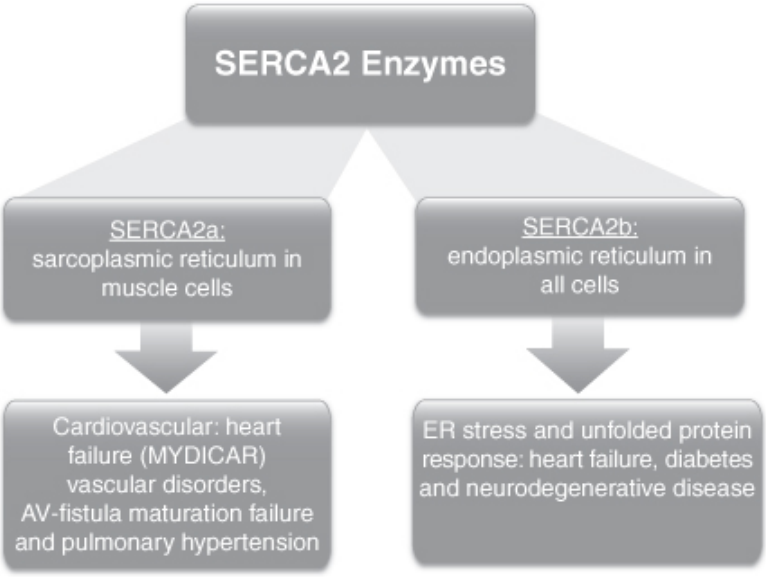
- ***Commercialize MYDICAR using a highly-targeted cardiology-focused sales force in the United States.*** Heart failure patients are largely treated at leading hospitals and medical centers of excellence by a select group of high-prescribing cardiologist and heart failure specialists. We plan to commercialize MYDICAR for all potential heart failure indications using a targeted sales force focused on these treating physicians. We believe cardiologists, heart failure specialists and interventional cardiologists are typically early adopters of innovative products, devices and technologies, in part because the rate of innovation in this sector has been sustained, and in part because of the large unmet need that their patients exhibit. We believe that MYDICAR would be adopted first by certain cardiologists and heart failure specialists at high-volume, key-opinion-leading hospitals and medical centers, and progressively by a broader segment of the market.
- ***Advance our small molecule platform targeting SERCA2 enzymes.*** We will leverage our leading position and proprietary scientific expertise in SERCA2 high throughput screening assays to identify SERCA2 small molecule product candidates. We have established early preclinical proof-of-concept results in the fields of heart failure, diabetes and neurodegenerative diseases. We plan to continue to advance these programs in certain diseases by ourselves or through a partnering strategy.
- ***Deploy capital strategically to develop our portfolio of product candidates and create shareholder value.*** We intend to deploy most of our capital resources, including the net proceeds from this offering, to further support the manufacture and clinical development of our lead product candidate, MYDICAR. We strive to leverage new clinical design principles and regulatory approval paths to advance our product candidates towards key value inflection points in a capital efficient manner. We believe we can maximize the value of our company by retaining substantial commercial rights to our product candidates and, where appropriate, entering into partnerships for certain indications and/or geographic territories. We believe this combination of independent development and targeted commercialization, together with selective partnering activities will allow us to capture substantial value of our product candidates while reducing our need for human and capital resources.

Our SERCA Platform

We target a specific class of proteins, or enzymes, that control calcium levels inside all cells. We believe that SERCA enzymes function as “master switches” that are critical to keeping cells of the body healthy through regulation of calcium levels. SERCA2 enzyme levels are deficient in many disease states, such as heart failure, AV-fistula maturation failure, PAH, diabetes and neurodegenerative diseases. We are applying our leading expertise in the field of SERCA2 biology towards the development of gene therapies and small molecule compounds to correct SERCA2 deficiencies and the resulting calcium imbalances within diseased cells. We believe that the involvement of SERCA2 deficiencies in multiple diseases and conditions creates “franchise” opportunities for our first-in-class gene therapy and small molecule product candidates.

We acquired leading AAV gene vector technology and developed proprietary delivery methods which form the basis of our MYDICAR platform. In addition, using our proprietary, patented SERCA2 screening assay, we have developed a broad platform of novel, first-in-class, small molecule modulators of the SERCA2b enzyme, creating development opportunities for product candidates targeting diseases associated with endoplasmic reticulum, or ER, stress-related pathways, such as diabetes and neurodegenerative diseases.

The following figure illustrates the opportunities and approach we are taking to target SERCA2 deficiency states:

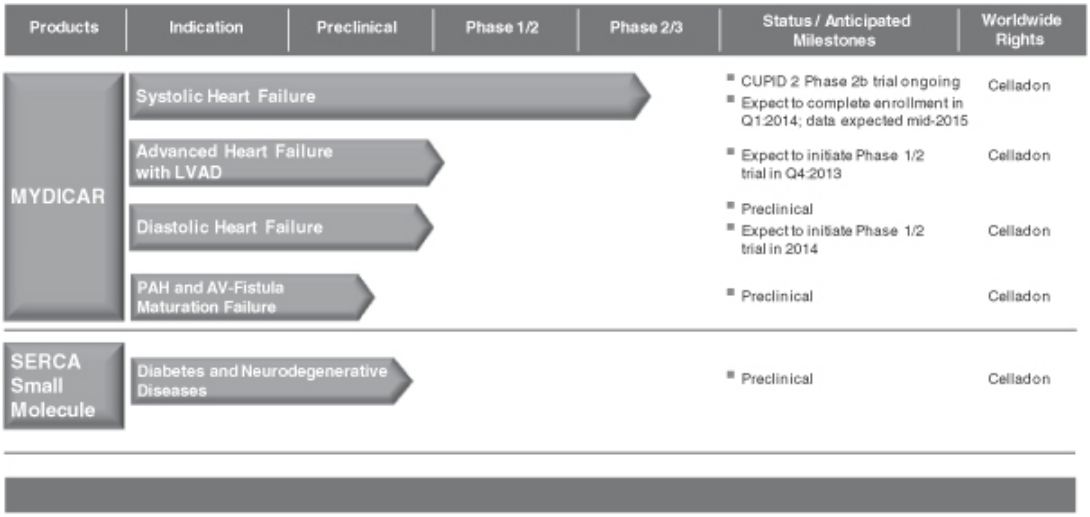


Our lead development program targets calcium dysregulation in the heart. Of the ions involved in the intricate workings of the heart, calcium is considered perhaps the most important. It enables the chambers of the heart to pump, or contract and relax, which causes blood to be propelled in and out of the heart. Calcium directly activates the myofilaments, which are threadlike structures in muscle fibers which cause contraction. Dysregulation of calcium is a central cause of heart failure due to both contractile (systolic) dysfunction, and relaxation (diastolic) dysfunction. One of the central causes of calcium dysregulation in heart failure is a deficiency in the level of SERCA2a enzymes in heart muscle cells. SERCA2a deficiencies are not limited to heart muscle cells, but are also present in blood vessel disorders such as AV-fistula maturation failure and PAH.

Another focus of our research program relates to a different form of the SERCA2 enzyme, SERCA2b. Specifically, these enzymes control calcium movement in the ER in all human cells. SERCA2b enzyme levels become deficient when cells are stressed by an accumulation of unfolded proteins, known as ER stress. There has been a proliferation of publications in scientific medical literature supporting the important role of ER stress in many diseases, including heart failure, diabetes and neurodegenerative diseases. We believe we are the industry leader in isolating small molecule modulators of the SERCA2b enzyme, which can correct underlying calcium dysregulation and ER stress. Our proprietary, novel, first-in-class, compounds have demonstrated activity in multiple preclinical models of diseases and conditions.

Our Product Pipeline

The following chart depicts key information regarding our development programs, their indications, and their current stage of development:



MYDICAR for Heart Failure

The Heart Failure Epidemic

Heart failure constitutes an important medical, social, and economic problem. Heart failure is a clinical condition in which the output of blood from the heart is insufficient to meet the metabolic demands of the body. According to the American Heart Association, or AHA, there are nearly six million patients currently diagnosed with heart failure in the United States. The prevalence of heart failure is progressively increasing due to an aging population and increasing prevalence of major cardiovascular risk factors, including obesity and diabetes. It is estimated that one in five adults at age 40 will develop heart failure during their remaining lifetime, and that approximately 250,000 to 500,000 patients in the United States are currently in the terminal phase of heart failure and have symptoms that cannot be effectively managed by existing optimized medical therapy. These patients suffer from disabling symptoms and often need hospitalization. The long-term prognosis associated with heart failure is worse than that associated with the majority of cancers, with approximate 50% mortality at five years following initial diagnosis. With over 280,000 heart failure-related deaths annually, we believe MYDICAR will provide a much needed therapeutic alternative for heart failure patients. We estimate that there are over 400,000 systolic heart failure patients in the United States alone who will be eligible for MYDICAR treatment upon launch.

Hospitalizations for heart failure are expensive and are particularly problematic, as the risk of death is increased with each recurrent heart failure-related hospitalization. There are one million primary heart failure-related hospitalizations annually in the United States alone. In 2010, the estimated direct and indirect cost of heart failure in the United States was $39 billion, half of which was related to repeated hospitalizations. By 2030, the total cost of heart failure in the United States is projected to increase to $70 billion. The one- and six-month readmission rates after heart failure-related hospitalization are close to 25% and 50%, respectively. The Affordable Care Act recently established the “Hospital Readmissions Reduction Program,” which requires Centers for Medicare & Medicaid Services to reduce payments to hospitals with excessive heart failure readmissions. As such, there is a growing pressure on hospitals to reduce readmissions for heart failure.

The pathologies resulting from heart failure are devastating. During heart failure progression, the heart steadily loses its ability to respond to increased metabolic demand, such as during intense physical activity. Patients suffer from increased shortness of breath in a progressive manner, and mild exercise soon exceeds the capacity of the heart to react to the increase in metabolic demand. Towards the end stage of the disease, the heart cannot pump enough blood to meet what the body needs even at rest. At this stage, fluids accumulate in the extremities or in the lungs, making the patient bedridden and unable to perform activities of daily living. In addition to constant shortness of breath, even minor deviation from a physical activity and diet restricted lifestyle can cause acute exacerbations, during which patients experience a drowning sensation and must be urgently hospitalized in intensive care or cardiac care units. Heart failure is classified in relation to the severity of the symptoms experienced by the patient. The most commonly used classification system, established by the New York Heart Association, or NYHA, is as follows:

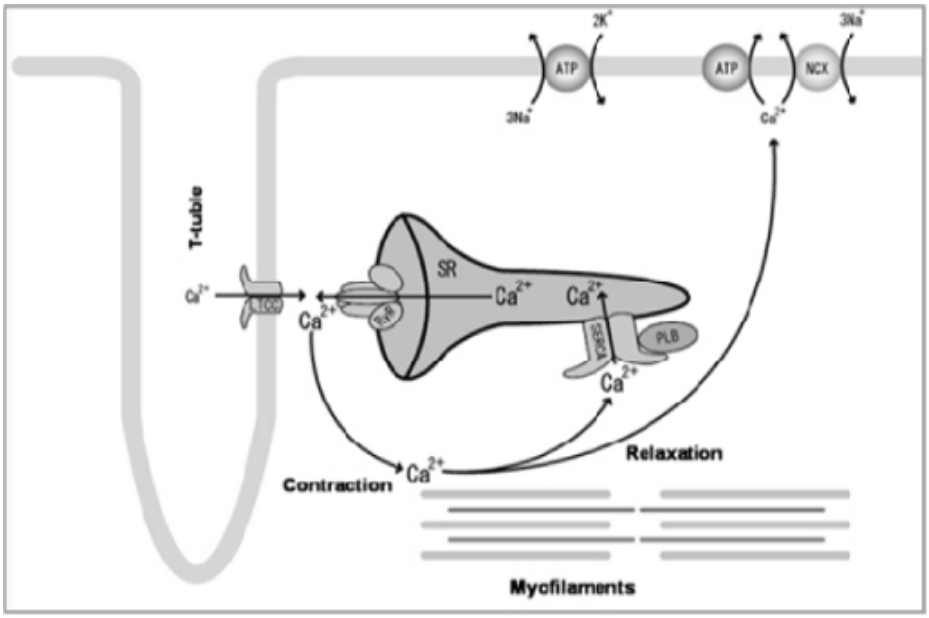
- Class I (mild): patients experience no or very mild symptoms with ordinary physical activity
- Class II (mild): patients experience fatigue and shortness of breath during moderate physical activity
- Class III (moderate): patients experience shortness of breath during even light physical activity
- Class IV (severe): patients are exhausted even at rest

The survival rate in each of these classes of heart failure is a function of the severity of the disease with the more advanced patients having poorer survival prognosis. Guideline-directed medical therapy for heart failure emphasizes angiotensin-converting enzyme, or ACE, inhibitors, angiotensin-2 receptor blockers if the patient is ACE intolerant, and beta blockers. There is recommendation for cardiac resynchronization therapy in certain patients. Implantable cardioverter-defibrillators, or ICDs, are used in patients at risk for sudden cardiac death. Despite these optimal guideline-directed therapies employing a wide range of pharmacologic, device, and surgical options, many patients deteriorate over time and develop advanced heart failure symptoms that cannot be effectively managed by existing optimized medical therapy. At the end stage of heart failure disease, current treatment options include heart transplant surgery or implantation of an LVAD. LVADs are battery operated mechanical circulatory devices used to partially or completely replace the function of the left ventricle of the heart for patients awaiting a heart transplant, or as a destination therapy for patients with NYHA Class IV heart failure who will never receive a heart transplant. Both of these end-stage treatment options require invasive open-chest surgery, include a host of complications such as lifetime immunosuppressive therapy in the case of transplant and risk of thrombosis and infection in the case of LVADs, and can cost in excess of $150,000.

Role of SERCA2a in Heart Failure

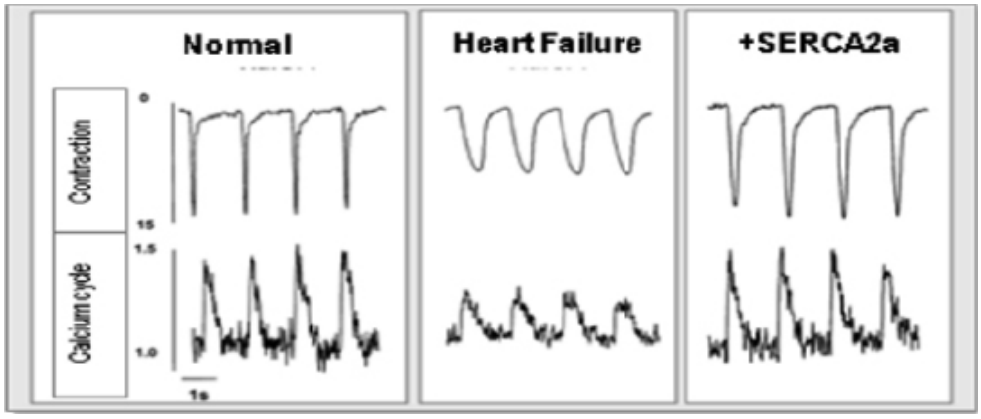
SERCA2a's role in heart failure was scientifically validated in the 1990s and immediately became the focus of the pharmaceutical industry discovery efforts. However, due in part to ineffective screening technologies, SERCA2a proved to be an elusive target and to date no other company has been successful in targeting SERCA2a using traditional discovery methods.

Heart failure is characterized by abnormalities in the various steps of the heart muscle pumping process. Intracellular calcium movements in the heart are tightly regulated at various levels within the heart's cells. An organelle called the sarcoplasmic reticulum, or SR, plays an important role in orchestrating the movement of calcium during each contraction and relaxation. The cardiac cycle is illustrated in the figure below.



During contraction, calcium is released from the SR, activating the myofilaments leading to muscle contraction. During relaxation, the majority of calcium is sequestered back into the SR by the SERCA2a enzyme leading to muscle relaxation. It is modulated through normal physiology via a protein known as phospholamban (PLB in the figure above), increasing activity when we exercise and decreasing activity when we rest. In advanced heart failure, SERCA2a enzyme levels are abnormally low, so patients cannot effectively modulate SERCA2a activity and increase their cardiac output even upon mild physical activity, such as walking or climbing stairs.

The figure below depicts *in vitro* studies of the contraction and relaxation and calcium cycle in normal human heart cells, in cells from patients with heart failure, and after correction of the SERCA2a deficiency in heart failure cells.



Even in end-stage human heart failure cardiac cells, correction of the SERCA2a deficiency is able to restore normal contractility, relaxation, and calcium cycling. This demonstrates the central importance of SERCA2a deficiency in heart failure, and the ability to reverse the abnormality in contraction and relaxation driving the pathogenesis of this serious medical condition.

Heart failure can be caused by a problem with cardiac contraction, relaxation, or both. Ejection fraction, or EF, is the measurement used to describe the contractility of the heart. Approximately half of heart failure patients suffer from contractility abnormalities (systolic heart failure, EF less than 45%) and the other half suffer from relaxation abnormalities (diastolic heart failure, or heart failure with preserved EF). Both forms represent a significant unmet medical need and we are also developing MYDICAR to target the diastolic form of the disease. Diastolic heart failure is characterized by a “stiff” ventricle. Based on the Framingham Heart Study conducted by the National Heart, Lung and Blood Institute and Boston University, the five-year mortality rate for patients with diastolic heart failure is 45–60%, which demonstrates the significant unmet need for effective treatments for this disease.

MYDICAR: Genetic Enzyme Replacement Therapy of SERCA2a Deficiency

Our lead product candidate, MYDICAR, uses genetic enzyme replacement therapy to correct the SERCA2a enzyme deficiency in heart failure patients that results in inadequate pumping of the heart. MYDICAR, which is delivered directly to the heart in a routine outpatient procedure, similar to an angiogram, in a cardiac catheterization laboratory, has the potential to provide transformative disease-modifying effects with long-term benefits in heart failure patients with a single administration.

Gene therapy alters a person’s deficient genetic material (encoded by deoxyribonucleic acid, or DNA). The altered genes, in turn, through a process called gene expression, can then produce the correct proteins and/or enzymes that were otherwise being produced improperly, or in the case of SERCA2 deficiency, at abnormally low levels. Gene therapy is accomplished through a process known as gene transfer, whereby a functional gene is delivered and incorporated into a patient’s cells through a delivery system called a vector, which are most commonly based on naturally-occurring viruses that have been modified to take advantage of the virus’ natural ability to introduce genes into cells. However, unlike naturally-occurring viruses, which replicate following infection of a target cell and have the capacity to infect new cells, viral vectors are modified to be non-replicating by deleting that portion of the viral genome responsible for replication. We believe that the growing body of gene therapy-based clinical data and the establishment of regulatory guidelines to govern the development and approval of gene therapy products suggest that gene therapy is positioned to emerge as an important new therapeutic modality for patients with significant unmet medical need.

MYDICAR, or AAV1/SERCA2a, utilizes AAV1 to deliver the gene for the enzyme SERCA2a. AAV1/SERCA2a consists of an outer protein shell, called a capsid, and inner DNA genome that contains a gene for SERCA2a. In a treated patient, the capsid delivers the genome to the target cell, where the DNA will direct expression of the SERCA2a protein. Different strains of AAV, called serotypes, have slightly different capsids, which target the vector to different cell types. AAV vectors are particularly well suited for the treatment of heart failure because:

- AAV vectors are safe; most people are exposed to the wild type of AAV during childhood, without developing any symptoms because AAV causes no disease. Regulatory authorities consider AAV vectors lower risk than other vectors commonly used in gene therapy, such as retroviruses or lentiviruses, because they present a low risk for inserting genetic material into the patient’s chromosomes, which is known as insertional mutagenesis and may lead to cancer. This is because AAV DNA exists in the cell as a circle, or plasmid, outside the main chromosomal DNA.
- AAV vectors are less immunogenic than other viral vectors commonly used in gene therapy, which have caused inflammatory reactions in some patients.
- AAV1 results in a highly efficient delivery of genes into muscle cells so extremely small quantities can be administered directly to the heart to achieve a therapeutic effect; approximately 1/10,000 of a gram

of AAV1 capsid protein is contained in a therapeutic dose. We have not observed any toxicities in our preclinical studies or clinical trials.

- AAV particles are small particles and pass freely through the blood vessel wall, bathing the heart muscle and providing broad distribution in the heart without the requirement for invasive or risky procedures. It is delivered directly to the heart over ten minutes in a simple outpatient procedure in a cardiac catheterization laboratory. Patients are awake under mild sedation, and outside of a small puncture in the groin or arm, feel no sensation as a catheter is advanced to the heart. Catheterization procedures like this are routine and are performed thousands of times a day around the globe for imaging the heart.
- Our AAV1 production and manufacturing technology has been developed with a focus on commercialization, and we believe we will be able to produce MYDICAR in large quantities to support our target markets.

After the AAV1/SERCA2a is infused in the arteries that feed the heart muscle, the AAV1 particle is taken up by the cells and results in expression of the normal SERCA2a human protein in the heart. This results in improved contractility, improved symptoms, and reductions in heart failure-related hospitalizations as demonstrated in our Phase 1 and Phase 2a trials of MYDICAR, which we refer to as the CUPID 1 trial.

Antibodies against AAV1 can block entry of MYDICAR into the target cells, and we have therefore developed a companion diagnostic to identify which patients do not have pre-existing NAbs against the AAV1 capsid proteins, and hence which patients are eligible for MYDICAR treatment. Approximately 50% of heart failure patients in the United States do not test positive for AAV1 NAbs and are eligible for MYDICAR treatment.

MYDICAR is initially being developed to treat patients with systolic heart failure. Heart failure caused by systolic dysfunction is characterized by a decreased contraction (EF less than 45%). We are developing MYDICAR to treat patients with diastolic heart failure characterized by a decreased relaxation (or heart failure with preserved EF). With over 280,000 heart failure-related deaths annually in the United States, we believe MYDICAR will provide a much needed therapeutic alternative for heart failure patients. We estimate that there are over 400,000 systolic heart failure patients in the United States alone who will be eligible for MYDICAR therapy upon launch.

MYDICAR Previous Human Experience in Systolic Heart Failure

We are the first company to enter clinical development with agents that selectively target this well-validated, key enzyme deficiency. In Phase 2a of the CUPID 1 trial, 39 patients with systolic heart failure were enrolled in a randomized-double-blind, placebo-controlled trial in which MYDICAR compared to placebo was found to be safe, reduced heart failure-related hospitalizations, improved patients' symptoms, quality of life and serum biomarkers, and improved key markers of cardiac function predictive of survival, such as end systolic volume, or ESV. The CUPID 1 trial included a single dose of MYDICAR with an on-study observation period of 12 months, plus a two-year long-term follow-up. Details are provided below, but an overall summary is as follows:

- MYDICAR was associated with benefit in clinical outcomes such as worsening heart failure, heart failure-related hospitalizations, need for LVAD implantation or heart transplant, or death.
- Benefit in clinical outcomes was supported by improvement in patients' heart failure symptoms, exercise tolerance, serum biomarkers, and cardiac function.
- High-dose MYDICAR (1 x 10^{13} DNase resistant particles) met the primary endpoint versus placebo at six months, and all positive trends were confirmed at 12 months.
- Benefit in preventing clinical events such as hospitalizations was confirmed at three years as well as a trend in improved survival. We expect to present the full three-year follow-up data at an upcoming medical conference.
- MYDICAR demonstrated an excellent safety profile.

CUPID 1, Phase 1 (CELL-001)

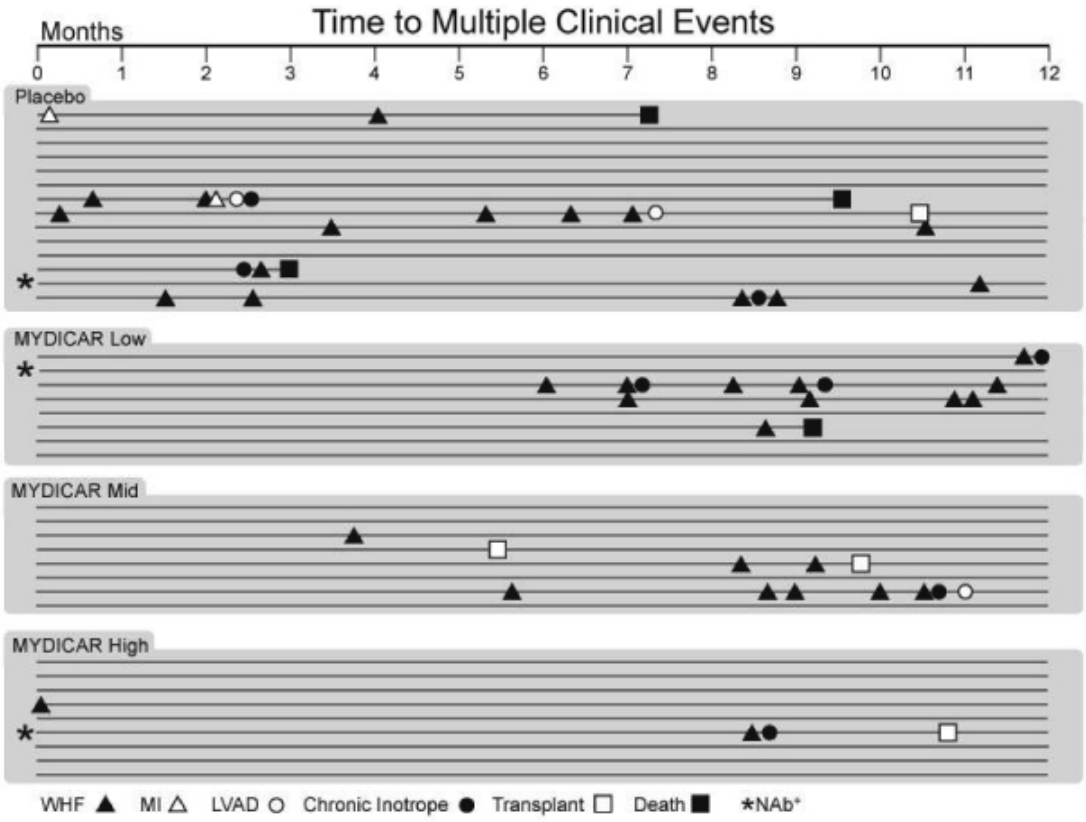
A total of 12 patients with heart failure (NYHA class III/IV) received a single intracoronary infusion of MYDICAR in an open-label dose-escalation trial in the United States. Administration of MYDICAR was on top of maximal optimized heart failure therapy. Doses administered ranged from 1.4 x 10^{11} to 1 x10^{13} DNase resistant particles, or DRP, per patient. The mode of administration was a ten-minute infusion into the coronary artery. MYDICAR demonstrated an excellent safety profile in this heart failure population, with no treatment related toxicities observed. Of the 12 patients who received MYDICAR, several demonstrated improvements from baseline to month six across a number of parameters important in heart failure, including symptomatic (NYHA and Minnesota Living with Heart Failure Questionnaire, five patients), functional (six-minute walk test and peak maximum oxygen consumption, five patients), biomarker (N-terminal prohormone brain natriuretic peptide, or NT-ProBNP, two patients), and left-ventricular, or LV, function/remodeling (EF and ESV, six patients). Quantitative evidence of biological activity across a number of parameters important for assessing heart failure status could be detected in several patients without pre-existing NAbs in this open-label trial.

CUPID 1, Phase 2a (CELL-001)

The Phase 2a design was a randomized, double-blind, placebo-controlled trial in 39 patients who received one of three different doses of MYDICAR or placebo. Twenty-five patients received MYDICAR and 14 received placebo. The mode of administration was a ten-minute infusion into the coronary arteries. All subjects had systolic heart failure (NYHA class III/IV). Treatment with either MYDICAR or placebo was on top of maximal optimized heart failure therapy. Seven efficacy parameters were assessed in four domains: symptoms (NYHA class and Minnesota Living With Heart Failure Questionnaire), functional status (six-minute walk test and peak maximum oxygen consumption), biomarker (NT-ProBNP), and LV function/remodeling (EF and ESV), plus clinical outcomes. The high-dose MYDICAR group versus placebo met the primary endpoint, which was demonstration of improvement across multiple domains without significant worsening in any domain. This combination of requirements resulted in a probability of success by chance alone (false-positive effect) of approximately 3%. The trial met the primary endpoint at six months (confirmed at 12 months) and demonstrated improvement or stabilization in the four efficacy domains.

The characteristics of recurrent clinical events and terminal events over the 12 months of the active observation period of the trial for Phase 2a portion of our CUPID 1 trial are illustrated in the figure below. Each line represents a single subject. Clinical events are depicted by symbols; a star at the beginning of a line represents subjects who were NAb positive at dosing. Patients who were AAV1 NAb positive at dosing had developed AAV1 NAbs during the period between their initial selection for participation in the trial and dosing, which in some cases, was as long as six months. We expect to use our companion diagnostic to screen out AAV1 NAb positive subjects going forward, as they are not expected to respond to MYDICAR therapy.

As can be seen from the figure below, despite maximal optimized background therapy, the clinical events (worsening heart failure, or WHF, myocardial infarction, or MI, LVAD implantation, use of chronic intravenous inotrope, heart transplant, or all-cause death) in the placebo group were substantial, underscoring the significant unmet need in this population, while in the MYDICAR high-dose group clinical events were limited. WHF was defined as signs and symptoms of heart failure requiring either hospitalization or treatment with intravenous diuretics, vasodilators or positive inotropes; mechanical fluid removal; or intra-aortic balloon pump



Clinical Events in CELL-001 Phase 2a

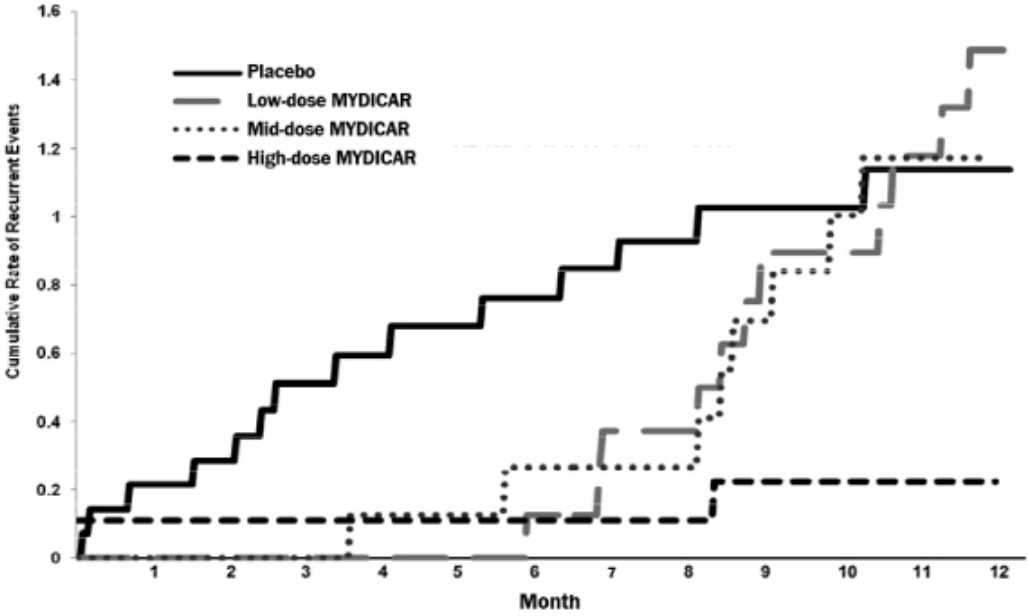
In the low-dose (1×10^{11} DNase resistant particles) and mid-dose (1×10^{12} DNase resistant particles) groups, there was a delay to the onset of clinical events, and in the high-dose group, a significant reduction: the relative risk reductions, or hazard ratios, at 12 months for the MYDICAR high-dose group versus placebo for recurrent adjudicated clinical events was 0.12, p=0.003 (where the p-value is the statistical probability of a result due to chance alone), representing a risk reduction of 88% for these important events with high-dose MYDICAR. The hazard ratios for recurrent clinical events are summarized by treatment group in the table below.

	Time to Multiple Clinical Events Analysis	
MYDICAR Dose vs. Placebo	**Hazard Ratio (CI) for Recurrent Clinical Events [1]**	**Risk Reduction**
Low-dose	0.40 (0.13, 1.21), p=0.11	60%
Mid-dose	0.44 (0.16, 1.24), p=0.12	54%
High-dose	0.12 (0.03, 0.49), p=0.003	88%

1 Recurrent clinical events include WHF and MI.

In the low- and mid-dose groups, there was a delay to the onset of clinical events, and in the high-dose group a significant reduction. In the low- and mid-dose groups, we believe the dose was not sufficient to insert the SERCA2a gene in enough cells of the myocardium to generate a long-lasting improvement in contractility. We have confirmed this in biopsy samples (see "CUPID 1 (CELL-001) Long-term Follow-up" below), since MYDICAR vector DNA was only detected at long time points in cardiac biopsies in the high-dose patients, but not in biopsies from any other group. Our hypothesis for why the low- and mid-dose groups demonstrate a delay to the onset of clinical events which is not durable relates to the short-term increase in blood flow to the heart after MYDICAR therapy; higher doses are required to insert the gene deep into the cardiac muscle cells.

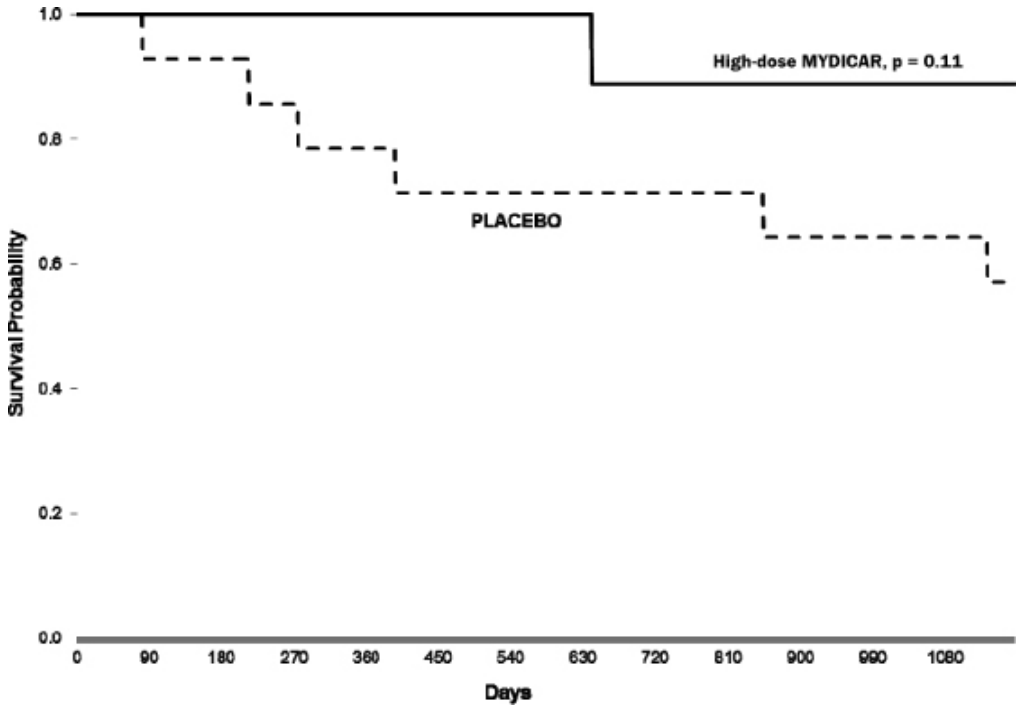
The frequency of cardiovascular-related events (WHF and MI), are shown in the figure below.



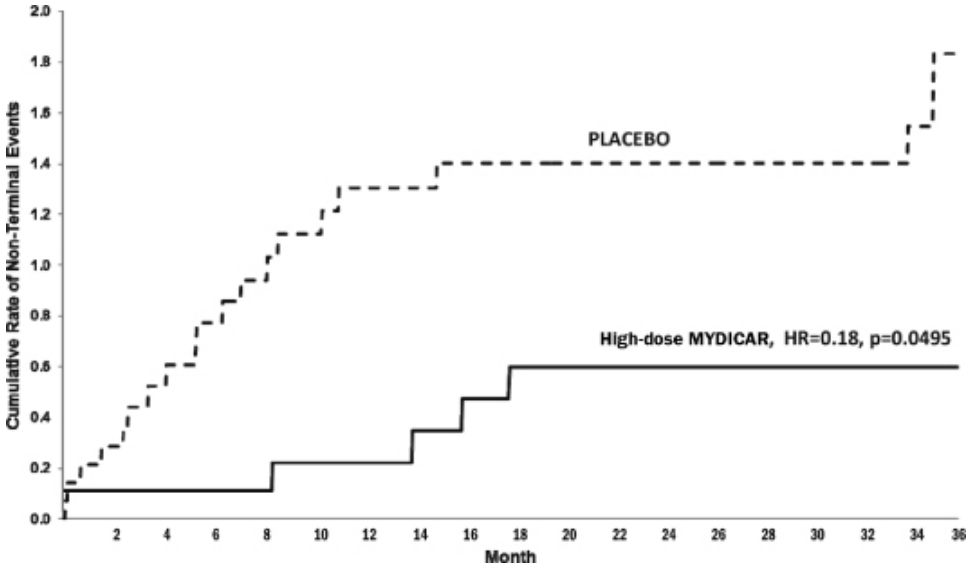
In addition to reducing the frequency of hospitalizations, the mean duration of heart failure-related hospitalizations over 12 months was substantially decreased (0.4 versus 4.5 days; p=0.05) on high-dose treatment versus placebo. Finally, there were no adverse safety findings.

CUPID 1 (CELL-001) Long-term Follow-up

The patients in the Phase 1 and Phase 2a portions of the CUPID 1 trial were followed for a total of three years. The following clinical events were tracked in all groups: WHF, LVAD implantation, heart transplantation, MI and all-cause death. At three years post-administration, there were 13 deaths: six in the placebo group, three in the low-dose group, three in the mid-dose group and one in the high-dose group (see the figure below for high-dose MYDICAR versus placebo). We expect that data from this trial for the full three year follow-up will be presented at an upcoming conference.



Throughout the three years of follow-up, the number of clinical events was high in the placebo group and high but delayed in the low- and mid-dose groups. Few events occurred in the high-dose group where we found evidence of gene expression (the risk of pre-specified recurrent clinical events over three years of follow-up was reduced by 82% in the high-dose group compared to the placebo group, p=0.049). The figure below depicts cumulative clinical event rates over the three years of follow-up.



Finally, persistence of the AAV1/SERCA2a vector DNA in the heart, in cases where heart tissue was made available, was demonstrated by a positive signal from quantitative polymerase chain reaction, or qPCR, testing in high-dose patients, but not in patients from the placebo or lower dose cohorts. The qPCR assay for AAV1/SERCA2a DNA has demonstrated persistence of the SERCA2a gene out to month 31 in the target tissue of one high-dose patient and to month 22 in another. A third high-dose patient demonstrated presence of vector DNA at month 23. All three patients with qPCR positive vector DNA results were in the high-dose group.

Our CUPID 1 trial results demonstrated a favorable safety profile of MYDICAR. No increases in adverse events, disease-related events or laboratory abnormalities were observed in any of the MYDICAR-treated subjects compared to those receiving placebo over the three-year period. There was no indication of an increase in any new occurrences or exacerbation of a pre-existing clinical conditions or prior disorders during long-term follow-up including malignancies, neurologic disorders, rheumatologic or other autoimmune disorders, hematologic disorders or other unexpected illnesses associated with MYDICAR administration.

Current and Future Clinical Development of MYDICAR for Systolic Heart Failure

The impact of high-dose MYDICAR on reduction of heart failure-related hospitalizations was an important finding from our CUPID 1 trial and current and future studies are designed to confirm these results and serve as the basis for potential regulatory approvals in the United States. Following completion of our CUPID 1 trial we held an End-of-Phase 2 meeting with the FDA, as a result of which the FDA indicated that:

- data supported proceeding to a Phase 3 clinical trial with high-dose MYDICAR;
- our proposed safety database, which will include approximately 610 patients (one-half treated), may be acceptable if the safety profile is similar to CUPID 1;

- time-to-recurrent heart failure-related hospitalizations, in the presence of terminal events, is acceptable as the primary endpoint, pending details of the statistical analysis plan and further discussion with agency statisticians; and
- a single trial may be acceptable for a biologics license application, or BLA, submission assuming statistically significant primary outcome and strong concordance of primary and secondary endpoint analyses.

We have also held a Type A SPA meeting with the FDA, as a result of which the FDA approved a 572-patient Phase 3 trial protocol under the SPA guidance and agreed that the design and planned analyses of this trial would be sufficient to provide data that, depending on outcome, could support a license application submission. Pursuant to the SPA, we also obtained an agreement from the FDA that the primary efficacy endpoint of time-to-recurrent heart failure-related hospitalizations in the presence of terminal events would be acceptable for a pivotal trial of MYDICAR. This endpoint counts multiple heart failure-related hospitalizations per patient, and "corrects" for the occurrence of terminal events. Other elements of the Phase 3 SPA protocol may be changed if agreed to in writing by both the FDA and us, including sample size. We are currently in discussions with the FDA regarding the use of the joint frailty statistical model as a method of analysis for the primary endpoint. Our extensive simulation studies have demonstrated that when recurrent heart failure-related hospitalizations and terminal events are correlated, the joint frailty model provides both high power to detect a treatment effect and strong control of false-positive rate. The FDA is currently performing additional simulations using our proprietary software to validate that the false-positive rate is acceptable for a pivotal trial using the joint frailty model.

The design of our CUPID 2 trial is substantially similar in design to the Phase 3 SPA protocol. Our CUPID 2 trial uses the identical primary efficacy endpoint, which is important as we have obtained an agreement on this endpoint with the FDA for use in a pivotal trial.

In 2012, we participated in European Scientific Advice Meetings with local authorities at the Paul Ehrlich Institute in Germany and the College ter Beoordeling van Geneesmiddelen, Medicines Evaluation Board in the Netherlands. Advice from these meetings was incorporated into the Clinical Trial Application for the CUPID 2 clinical trial. We plan to meet with the Scientific Advice Working Part of the EMA to obtain scientific advice regarding the overall development program and most expeditious approval route for MYDICAR.

MYDICAR for Systolic Heart Failure

CUPID 2 Trial (CELL-004)

The primary objective of our ongoing CUPID 2 trial is to determine the efficacy of a single intracoronary infusion of high-dose MYDICAR compared to placebo, in conjunction with maximal optimized heart failure therapy, in reducing the frequency of and/or delaying heart failure-related hospitalizations in patients with systolic heart failure (EF less than 35%) who are at increased risk of terminal events based on elevated levels of NT-ProBNP or a recent heart failure-related hospitalization.

The population is adult patients, 18 to 80 years of age, with NYHA class II-IV heart failure due to ischemic or non-ischemic cardiomyopathy, and increased risk of heart failure-related hospitalizations. A total of 200 patients (N=100 per treatment arm) will be enrolled to obtain at least 180 adjudicated heart failure-related hospitalizations. We may enroll a slightly higher number of patients as we come towards the end of the trial, as we will not withhold MYDICAR from a patient that has successfully completed screening tests and is eligible for treatment. Furthermore, we will target a total number of patients enrolled such that we will be able to target the appropriate number of adjudicated heart failure-related hospitalizations.

Patients are randomized in parallel to high-dose MYDICAR or placebo in a 1:1 ratio. The trial is being conducted at approximately 60 sites in the United States, Denmark, Sweden, Germany, Poland, Belgium, the Netherlands, the United Kingdom, Israel, and Hungary, with randomization stratified by country.

Potential trial participants are prescreened for the presence of NAbs against AAV1 using our companion diagnostic. Those who test negative for AAV1 NAbs undergo further screening tests and procedures to determine eligibility prior to randomization and enrollment into the trial. Those who test positive for AAV1 NAbs are excluded from the trial. Data analyses will be performed when all patients have completed the full 12-month active observation period and at least 180 adjudicated heart failure-related hospitalizations have occurred. An independent Data Monitoring Committee, or DMC, responsible for monitoring safety of the trial, has met twice, and determined that there were no safety issues to date. Because CUPID 2 is an event-driven trial, all clinical events are reviewed by both the unblinded DMC and by an independent blinded Clinical Endpoint Committee, or CEC. Each patient will be followed for a minimum cumulative total of 24 months, including time in a 12-month active observation period and a 12-month long-term follow-up period.

In CUPID 2 the endpoints were chosen to capture disease burden fully and to gain efficiency by including all terminal events (e.g. all-cause death, heart transplants and LVAD implantation) in the analyses. There are many statistical methods for the analysis of recurrent events; however, the joint frailty model addresses the limitations of other approaches, as it accounts for the correlation between the recurrent event process and the terminal event process (informative censoring).

The primary efficacy endpoint is time-to-recurrent advanced heart failure-related hospitalizations in the presence of terminal events at the time of primary analysis data cutoff. In the primary endpoint analysis the treatment effect estimate (hazard ratio for recurrent heart failure-related hospitalizations for MYDICAR versus placebo adjusted for correlated terminal events), will be calculated using the joint frailty model. Additional endpoints include Kansas City Cardiomyopathy Questionnaire (quality of life) and six-minute walk test (exercise capacity). NYHA class will be descriptively summarized by time point for each treatment group.

The sample size for our CUPID 2 trial is based on Monte Carlo simulations so that 200 patients with an estimated total of 180 heart failure-related hospitalizations, should provide at least 80% power at the 0.05 two-sided significance level to detect at least a 41% risk reduction (hazard ratio of 0.59) based on time-to-recurrent heart failure-related hospitalizations in the presence of the terminal events. The assumed magnitude of treatment effect is based on the data from published studies in heart failure patients and a conservative estimate of the anticipated magnitude of effect of MYDICAR based on 12-month results from CUPID 1 that showed an 88% reduction in recurrent clinical events adjusted for correlated terminal events with high-dose MYDICAR compared to placebo. We expect to complete enrollment of this trial in the first quarter of 2014 and announce results in mid-2015.

Upon completion of our CUPID 2 trial, the results will be discussed with the FDA and the EMA with the possibility that MYDICAR could potentially qualify for approval if the trial outcome demonstrates substantial reduction in recurrent heart failure-related hospitalizations and concordant trends in reduction in and/or delay of terminal events overall, and death in particular. However, if the FDA requires a further trial, we have an SPA in place for an approximately 572-patient Phase 3 pivotal trial using the same endpoint as in our CUPID 2 trial. We believe the results of one or both of these trials could support submission of a BLA and a Marketing Authorization Application, or MAA, filing for MYDICAR for the treatment of systolic heart failure. However, there can be no assurance that regulatory agencies will not require one or more additional clinical trials prior to granting regulatory approval.

AGENT-HF Trial (AAV1-CMV-SERCA2a Gene Therapy Trial in Heart Failure)

This trial is an investigator initiated clinical trial which is expected to commence in 2013. The trial is partially funded by the French government and sponsored by Assistance Publique – Hôpitaux de Paris. We are providing investigational medicinal product and some financial support. This trial is not required by any regulatory authorities for systolic heart failure indications.

The primary objective of the AGENT-HF Trial is to determine whether treatment with MYDICAR leads to reverse remodeling of the heart. In patients with heart failure, the size, shape, structure and physiology of their

heart changes over time, and these changes that lead to a progressive decline in LV function are referred to as remodeling. In reverse remodeling, there would be changes back to the more normal, healthier state of the heart along with an improvement in the functioning of the heart. This trial will enroll approximately 44 heart failure patients in France with half receiving MYDICAR and the other half placebo. The primary endpoint at six months will be change, compared to baseline, in LV ESV as measured by cardiac computed tomography.

CELL-005 AAV1 NAb Positive Trial

The primary objective of the AAV1 NAb positive trial is to determine the safety of a single intracoronary infusion of high-dose MYDICAR in patients who test positive for AAV1 NAbs. The FDA has required this safety study as a condition to the submission of a BLA, to cover the possibility that MYDICAR may be used off-label in AAV1 NAb positive patients. In addition, the trial would explore the potential level of activity of MYDICAR in AAV1 NAb positive patients, although the trial would not be of sufficient size to detect statistical differences in the response in patients who test positive for AAV1 NAbs versus those who test negative. The patient population would be similar to the target patient population in our CUPID 2 trial and would be approximately 60 to 80 patients. Patients would be stratified by baseline AAV1 NAb titer – either negative/equivocal or positive (³1:2) – and randomized in parallel, in a 2:1 ratio, to either MYDICAR or placebo. The primary endpoint after all subjects had been followed for at least six months would be safety as measured by the incidence and severity of adverse events, including all-cause mortality and heart failure-related hospitalizations. The percentage of subjects experiencing an event would be calculated for survivors and for all patients enrolled. Frequency, type and duration of cardiovascular hospitalizations will also be analyzed. The CEC would classify all deaths and hospitalizations, distinguishing between the primary cause and immediate underlying cause of death or hospitalization. The following activity/efficacy variables would be summarized descriptively by treatment group as the trial is not powered to detect a statistical significance in any of the variables: distance walked during the six-minute walk test, NT-proBNP levels, NYHA classification, and quality of life assessed by the Kansas City Cardiomyopathy Questionnaire. We expect to initiate this trial in 2014.

CELL-006 Viral Shedding Trial

The viral shedding trial is required as part of the environmental risk assessment that must be included in a marketing application to regulatory authorities, both in the United States and in Europe. In this open-label trial, ten patients with heart failure (the same target patient population as our CUPID 2 trial and our AAV1 NAb positive trial) will be treated with high-dose MYDICAR and will be followed until they have two consecutive bodily fluid samples that are negative for presence of the SERCA2a gene, as assessed by qPCR. The patients will continue to be followed for safety for up to two years to add to the overall MYDICAR safety database. With the information from this trial, the marketing application would have information on how long treated patients would be excreting MYDICAR into the environment, thereby potentially spreading the virus to family members, health care workers and the public. We expect to initiate this trial in 2014.

Preclinical Studies of MYDICAR in Systolic Heart Failure

Preclinical studies have shown that, after administration of an AAV vector, the plasmids containing the vector DNA are cleared from the blood and tissues via the mononuclear phagocyte system in liver, spleen and lymph nodes, and lungs. After intracoronary delivery, AAV particles which are not taken up in cardiac tissues are first passed through to the lung via the coronary sinus, making this the first pass organ. Stable, long-term presence of viral DNA, SERCA2a protein, and vector-derived SERCA2a mRNA have been demonstrated in cardiac tissue of normal rats for up to one year following a single administration of MYDICAR.

Gene transfer of SERCA2a is associated with improved cardiac function in various rodent models of heart failure. Improved heart function and enhanced expression of SERCA2 have also been demonstrated in an ovine (sheep) pacing-induced heart failure model with MYDICAR. SERCA2 gene transfer has also been associated with restoration of SERCA2a expression and improved heart function in both a dog-pacing heart failure model

and in a chronic myocardial ischemia-induced heart failure model in mini-pigs. Beyond the effects on enhancing contractility, SERCA2a gene transfer has been shown in preclinical studies to restore the energetic state of the heart (both in terms of energy supply and utilization), to decrease arrhythmias, and enhance blood flow to the heart through expression in endothelial cells.

Several studies we have sponsored have established pharmacologic activity for MYDICAR gene transfer in animals with heart failure, with data demonstrating restored SERCA2a expression and stabilization/improvement in heart function. The pharmacology study was conducted in the porcine (pig) mitral regurgitation, or MR, heart failure model. MR induces reduced myocardial contractility, elevated B-type natriuretic peptide, or BNP, levels and other signs and markers which are virtually identical to those associated with the human disease, including a decrease in SERCA2a expression. MYDICAR-treated animals demonstrated significant improvements in the heart's ability to contract and relax and improved ventricular volumes. In these studies, there was an absolute increase of 16% in median EF in MYDICAR-treated animals as compared to control animals. ESV increased in the control group by a median of 16 milliliters, or a median relative increase of 35%, an indication of decreased contractility and cardiac enlargement, compared with the MYDICAR group, which showed a tendency to decrease LV ESV by a median of 9.9 milliliters (a median decrease of 14%). In humans, a reduction in ESV of 10% signifies clinically relevant reverse remodeling, which is a strong predictor of lower long-term mortality and heart failure clinical events. Treated animals also had lower BNP levels post-dosing.

We have also sponsored two safety toxicology and biodistribution studies, both in normal mini-pigs. Both were three-month studies simulating the clinical administration procedure for MYDICAR or placebo with 5, 30 and 90 day sacrifice time points. Doses of up to three times the human dose on a weight-adjusted basis were administered. No mortalities were observed in either study and treatment with MYDICAR was not associated with any signs of toxicity or effects on body weight, sperm motility, clinical pathology, gross pathology, clinical chemistry parameters, organ weights or histopathology. No significant effects were observed on cardiovascular parameters, including electrocardiographic intervals. There were no test article-related observations during the necropsies. Mild increases in troponin I were observed in eight out of a total of 36 MYDICAR-treated animals in the first study, barely above upper limits of normal for humans. These increases were not considered to be related to MYDICAR or biologically significant and were not observed in the second study. No treatment related changes in troponin I values were observed across the other large animal pharmacology studies.

MYDICAR in Additional Indications

Beyond our proposed lead indication of systolic heart failure, we also plan to develop MYDICAR for additional indications such as diastolic heart failure, treatment of AV-fistula maturation failure and PAH. Each of these diseases is characterized by a SERCA2a deficiency, and MYDICAR has demonstrated disease-modifying capability in preclinical models of these diseases. The broad potential of MYDICAR in multiple indications presents opportunities to maximize the value of our development programs for indications that are poorly managed by existing treatment options.

MYDICAR - LVAD Trial Investigation of the Safety and Feasibility of AAV1/SERCA2a Gene Transfer in Patients with Heart Failure and an LVAD

This trial is partially funded by the British Heart Foundation, sponsored by Imperial College London, and is expected to start in the fourth quarter of 2013. We are providing investigational medicinal product and some financial support. It is not a required trial by any regulatory authorities; however, it could potentially serve as a proof-of-concept trial to support the use of MYDICAR to wean patients off of an LVAD. The use of these devices present a host of risk factors for the patient, such as increased risk of thrombosis and infections, and these devices do not last for long periods of time. Given that the circulatory system of a patient with an LVAD is dependent on these devices, device failure usually translates to a catastrophic event for the patient. The primary objectives of the SERCA2a-LVAD trial are to determine (1) the safety and feasibility of using MYDICAR to treat heart failure patients who have an LVAD, (2) how well MYDICAR delivers the gene for SERCA2a to heart cells and (3) what impact

circulating NAbs to AAV1 have on the ability of MYDICAR to deliver the SERCA2a gene to heart muscle cells. This trial will enroll approximately 24 patients in the United Kingdom with varying levels of circulating NAbs to AAV1, 16 of whom will be treated with MYDICAR and eight with placebo. Six months post-treatment, all patients will undergo a heart biopsy for collection of tissue to determine the presence of the SERCA2a gene. In addition, safety data and changes in LV function will be collected and analyzed.

MYDICAR - HF/pEF MYDICAR for Heart Failure with Preserved Ejection Fraction (Diastolic Heart Failure)

As in systolic heart failure, a consistent finding in diastolic heart failure is a decrease in the expression of SERCA2a—a change that is seen in most animal models of heart failure and in human hearts with diastolic dysfunction. In preclinical studies, overexpressing SERCA2a using gene therapy in streptozotocin-treated transgenic mice demonstrated that increasing SERCA2a could improve diastolic function. In human cardiomyocytes isolated from the left ventricle of patients with end-stage heart failure, SERCA2a levels were correlated with improved diastolic function. We have also evaluated MYDICAR in another preclinical study in a rat model for spontaneous non-insulin-dependent type II diabetes mellitus, which is characterized by diastolic dysfunction and associated with abnormal calcium levels and decrease in SERCA2a expression. In this study, SERCA2a gene transfer restored diastolic function to normal. These data showed that SERCA2a overexpression may be used as a therapeutic strategy for the treatment of this disease.

SERCA2a gene transfer has also been demonstrated to improve diastolic cardiac function in aged animals. In preclinical studies, cardiac SERCA2a protein and ATPase activity were significantly decreased in elderly rat hearts compared with adult rats and were restored to adult levels after SERCA2a gene transfer. Diastolic function parameters, which were adversely affected in elderly rat hearts, were restored by overexpression of SERCA2a, supporting the hypothesis that decreased SERCA2a contributes to the functional abnormalities observed in elderly hearts and demonstrating that targeting SERCA2a in the elderly heart may lead to improved diastolic cardiac function.

The MYDICAR- HF/pEF trial would be our pilot clinical trial for the treatment of diastolic heart failure, which comprises approximately half of all heart failure cases. We anticipate that the existing data we have generated for our proposed systolic heart failure indication would allow us to launch directly into a Phase 1/2 trial in approximately 40 patients with diastolic heart failure with the objectives of assessing safety and preliminary efficacy of a single intracoronary infusion of high-dose MYDICAR compared to placebo. Patients would be randomized in a ratio of 1:1 (MYDICAR versus placebo) and safety would be assessed in a manner similar to the assessment method used in our CUPID 2 trial. Preliminary efficacy would be assessed by concordant clinically meaningful changes at six months versus baseline in diastolic function, NT-proBNP, NYHA, quality of life, distance walked in the six-minute walk test and recurrent heart failure-related hospitalizations in the presence of terminal events.

We expect to initiate this trial in 2014.

MYDICAR in Pulmonary Arterial Hypertension (SERCA2a-PAH)

PAH is an increase of blood pressure in the pulmonary artery, pulmonary vein, or pulmonary capillaries, together known as the lung vasculature, leading to shortness of breath, dizziness, fainting, leg swelling and other symptoms. PAH can be a severe disease with a markedly decreased exercise tolerance and an increased likelihood of heart failure.

PAH is characterized by dysregulated proliferation of pulmonary artery smooth muscle cells, or PASMC, leading to maladaptive vascular remodeling. In the systemic circulation, vascular injury is associated with

downregulation of SERCA2a, and subsequent alterations in calcium homeostasis in PASMC stimulates proliferation of PASMC. SERCA2a expression is decreased significantly in remodeled pulmonary arteries from patients with PAH and the rat monocrotaline, or MCT, model of PAH. In preclinical studies, overexpression of SERCA2a in human coronary artery endothelial cells *in vitro* resulted in increased endothelial nitric oxide synthase expression and activation, which increased vascular relaxation. In MCT rats with established PAH, gene transfer of SERCA2a via intratracheal delivery of MYDICAR decreased pulmonary artery pressure, vascular remodeling, right ventricular hypertrophy and fibrosis compared to controls. Similarly, aerosolized MYDICAR delivered at the time of MCT administration limited adverse hemodynamic profiles and indices of pulmonary and cardiac remodeling compared with controls.

Prior to initiation of the SERCA2a-PAH trial, additional formulation and toxicology studies would have to be completed, and a separate IND would have to be filed. We expect that development work for this proposed indication would be funded opportunistically, or through a partnering strategy.

MYDICAR in AV-Fistula Maturation Failure (SERCA2a-AV-Fistula)

Currently, over 500,000 Americans have end-stage renal disease requiring dialysis. An AV-fistula, which is a surgically created connection between an artery and a vein in the arm of the patient, has proven to be the most durable, least complicated, and therefore preferred mode of access for hemodialysis. Approximately 100,000 fistulae are placed yearly in the United States. However, a clinical problem that has resulted from this practice is that, following surgery to create the fistula, approximately 40% fail to mature to a usable state. Maturation failure has been attributed to rapid proliferation of vascular smooth muscle cells, or VSMC, resulting in vascular blockage or occlusion. In preclinical studies, SERCA2a enzyme deficiency has been associated with VSMC proliferation, and increasing SERCA2a activity has been shown to prevent VSMC proliferation, thereby aiding AV-fistula maturation.

Prior to initiation of the SERCA2a AV-fistula trial, additional formulation studies would have to be completed, and possibly a separate IND would have to be filed. We expect that development work for this proposed indication would be funded opportunistically, or through a partnering strategy.

Sales and Marketing

We have full worldwide commercial rights to all of our development programs. We believe we can maximize the value of our company by retaining substantial commercialization rights to our product candidates and, where appropriate, entering into partnerships to develop and commercialize certain product candidates in specific therapeutic indications and/or geographic territories.

Our current strategy is to market MYDICAR for all potential heart failure indications using a dedicated direct sales model focused on selected cardiologists and heart failure specialists. These specialists are associated with hospitals and their referral networks to supporting interventional cardiologists and cardiac catheterization laboratories are well established and we believe they represent a concentrated customer base suitable to a specialist care sales model. We believe that MYDICAR would be adopted first by high-volume key-opinion-leader hospitals and medical centers, and progressively by a broader segment of the market. We believe that therapy adoption generally occurs much faster in the United States compared to Europe or the rest of the world. Cardiologists, heart failure specialists, and interventional cardiologists, have a history of early adoption of innovative products and technologies, in part because the rate of innovation in this sector has been sustained, and in part because of the large unmet need that their patients exhibit.

We therefore believe that a commercial strategy involving a progressive build out of commercial infrastructure in the United States covering key prescribers and centers of excellence is one that we can realistically pursue. Our commercialization strategy for MYDICAR in different geographies and indications beyond heart failure will continue to be evaluated and may involve strategic partners.

Manufacturing of MYDICAR (AAV1/SERCA2a)

AAV has many characteristics that facilitate large scale manufacturing and distribution, when exploited effectively. We believe that our significant investment in AAV1/SERCA2a process development and analytical characterization has paid off in an inherently scalable, proprietary manufacturing process that is capable of supplying a global market as large as heart failure with a gene therapy product.

The technology includes a coordinated design of the AAV1/SERCA2a vector genome (the vector DNA) and the production system. AAV vectors are made "gutless," meaning that they do not contain viral genes. Only the two small non-coding elements from the parent virus are needed for replicating and packaging the vector DNA during production, which can be provided separately. The genome was also designed to be very close to the size of the parent AAV genome, to optimally fit within the AAV capsid.

Our state of the art manufacturing process for AAV1/SERCA2a was developed based on proven industrial cell culture methodologies. Like many of the manufacturers of recombinant monoclonal antibodies or proteins, we use cell-suspension based culturing techniques and intend to use stirred tank bioreactors for large scale cell culture and production. Our envisioned commercial production scale is 2,000 liters, which is one-tenth the volume of the largest industrial production vessels, so our anticipated production scale is far from the limits of the technology. We selected stirred tank production bioreactor technology as our production system because it has been the workhorse for recombinant protein production for more than 20 years. For purification of AAV1/SERCA2a, we use industrial chromatography columns and resins, and filtration technology common to the biopharmaceutical industry. We believe these materials and equipment are common for good manufacturing practices, or GMP, manufacturing of FDA approved biological products.

Our Approach for Producing AAV1/SERCA2a

By specifically creating a cell line for the manufacture of AAV1/SERCA2a that has the necessary components stably integrated into the cell line, we have created a production process similar to other industrial processes used to treat large market disease indications.

We use standard cell culture techniques and standard equipment in production and purification found in industrial cell culture drug manufacturing. All media used for cell growth and production are free of animal-derived components. To induce production of AAV1/SERCA2a, the cells are infected with a highly characterized batch of adenovirus. AAV viruses in nature and AAV vectors are not capable of replicating on their own and require a helper virus, such as adenovirus, to initiate replication. The purification process was designed to yield a high purity AAV1/SERCA2a product. Special attention was placed on the inactivation and removal of adenovirus and its free components, clearance of DNA and protein impurities, and even intact host cells.

MYDICAR drug product is produced by an FDA registered contract manufacturer. The manufacturing process is relatively simple: drug product is diluted to a specified concentration, filter-sterilized, and vials are aseptically filled into single-use standard pharmaceutical grade vials and stoppered using an automated filling machine. The final drug product is stored frozen or refrigerated until use.

Our Plans for Scale-Up and Our Approach to Commercial Manufacturing

Our production process has already been successfully scaled up from lab scale to the 250 liter clinical scale. Of the limited number of batches produced at 250 liters, two batches were successfully produced under GMP manufacturing conditions at Targeted Genetics Corporation (now AmpliPhi Biosciences Corporation) in Seattle, Washington. We expect risk for scale-up to the 2,000-liter commercial scale to be minimal, based on our knowledge and experience, and the proven track record of the stirred tank bioreactor technology and industrial chromatography. We have selected a contract manufacturing organization, Lonza Houston, Inc., or Lonza, a worldwide leader of biological product manufacturing with extensive experience in viral manufacturing, for

transfer of the process and conducting the scale-up to the commercial scale of 2,000 liters, which is expected in 2014. Our experienced technical staff has worked closely with Lonza staff on the transfer of the process and is now actively involved in the planning and strategy for scale-up and commercial production.

Our plan for commercial manufacturing is to establish commercial supply agreements with Lonza for product launch and commercial supply. We plan for the AAV1/SERCA2a manufacturing process to be designed and operated using standard off-the-shelf equipment, including a 2,000-liter disposable bioreactor, within a simple modular cleanroom. The concept is to have a production train that can be replicated in standardized fashion to ensure that from facility to facility the manufacturing process is operated exactly the same using identical equipment, material and supplies. We anticipate that one production train will meet global product requirements for our expected first indication, systolic heart failure. However, if actual product demand is greater than anticipated or additional indications gain approval, we believe that the standardized approach will allow for an easy and quick start-up of additional production trains. Our approach is designed to minimize capital costs and provide nimbleness and expandability of the production process.

MYDICAR Clinical and Commercial Supply

We currently have enough MYDICAR clinical supplies (drug product) to complete the CUPID 2, MYDICAR-LVAD and AGENT-HF trials. One additional batch of clinical supply can be produced from the remaining batch of bulk drug substance produced to supply our MYDICAR-HF/pEF, AAV NAb positive trial, and viral shedding trial. Another batch of drug substance and drug product would be required to conduct a Phase 3 clinical trial of MYDICAR, if required.

We have engaged Lonza for the manufacture of MYDICAR for use in our clinical trials, and we expect to enter into an agreement with Lonza for the commercial supply of MYDICAR. We expect that Lonza will build a commercial manufacturing facility in the Houston area or surrounding vicinity with capability up to 2,000 liter bioreactor capacity, which is expected to be operational in 2015. If we are successful in entering into a commercial scale supply agreement with Lonza, and Lonza's construction and build-out proceeds as we expect, we anticipate that MYDICAR will be launched from Lonza's new commercial facility, and that production from the Lonza facility will be sufficient to meet our initial projected commercial demand for MYDICAR.

Companion Diagnostic

The presence of pre-existing NAbs against the proteins that encapsulate the AAV1 gene therapy agent can block entry of the gene therapy agents into their target cells. Preclinical and limited clinical results with AAV1 NAb positive animals or patients, as well as *in vitro* neutralization experiments, have demonstrated that the detection of AAV1 NAbs is important prior to treatment with MYDICAR. Our experience in our CUPID 1 and CUPID 2 trials indicates that 50% of the heart failure patients in the United States are AAV1 NAb negative and hence eligible for MYDICAR therapy. In other countries, such as Poland, the prevalence of pre-existing AAV1 NABs is significantly higher.

We have developed a companion diagnostic AAV1 NAb assay for use in combination with MYDICAR in order to qualify subjects for treatment in clinical trials and for commercial use. The AAV1 NAb assay is intended to measure the loss of infectivity of AAV1/GFP (green fluorescent protein), an AAV1 recombinant particle with a reporter gene following treatment with subject's serum (i.e., neutralization). Diluted samples of a subject's serum are incubated with AAV1/GFP, and then the mixture is tested for vector activity/infectivity *in vitro* on a permissive cell line (testing the relative gene expression (fluorescence) as a measure of vector neutralization).

To date, our tests to measure a potential clinical trial participant's level of pre-existing NAbs have been performed for us by Laboratory Corporation of America Holdings. We expect that the commercial assay, if approved, would be automated and similarly run by a strategic partner in several locations

worldwide. It is not expected that the assay will be provided to the laboratories as a stand-alone kit but that approved laboratories would purchase the cells, controls and critical reagents, AAV1/GFP, from qualified suppliers. We intend that Quality System regulation set forth in 21 CFR Part 820 would be followed for the manufacture of AAV1/GFP and for the performance of the assay.

Companion diagnostics are subject to regulation by the FDA, the EMA and other foreign regulatory authorities as medical devices and require separate regulatory clearance or approval prior to commercial use. We anticipate that our companion diagnostic will require approval under a pre-market approval application, or PMA, submitted to the FDA's Center for Devices and Radiological Health, or CDRH, prior to commercialization. We further anticipate that regulatory approval of our companion diagnostic will be a prerequisite to our ability to market MYDICAR. Representatives of CDRH have participated in our meetings with the Center for Biologics Evaluation and Research, or CBER, regarding MYDICAR to discuss the potential use of our companion diagnostic, and we anticipate that future meetings will include representatives from both CBER and CDRH to ensure that the BLA submission (for MYDICAR) and PMA submission (for the companion diagnostic) are coordinated and subject to parallel review by these respective FDA centers. Accordingly, our objective is to align the development programs such that the companion diagnostic will be developed and approved contemporaneously with MYDICAR.

Competition

The biotechnology and pharmaceutical industries in which we operate are subject to rapid change and are characterized by intense competition to develop new technologies and proprietary products. We face potential competition from many different sources, including larger and better-funded pharmaceutical companies. While we believe that MYDICAR's unique mechanism of action provides us with competitive advantages, particularly given that MYDICAR is designed to be administered in conjunction with other pharmacological agents and devices (except LVADs), we have identified several companies which are active in the advancement of gene therapy products in the heart failure arena as of the date of this prospectus. Not only must we compete with other companies that are focused on gene therapy treatments, any products that we may commercialize will have to compete with existing therapies and new therapies that may become available in the future.

Some of the pharmaceutical and biotechnology companies we expect to potentially compete with include Renova Therapeutics, NanoCor Therapeutics, Juventas Therapeutics, VentriNova and Beat BioTherapeutics. Renova, Beat BioTherapeutics and Juventas are in the clinical stages of development with their gene therapy products targeting moderate to advanced heart failure. Renova is using adenovirus serotype 5 encoding human adenylyl cyclase type 6 in a Phase 1/2 trial, while Juventas is enrolling a Phase 2 trial with its product candidate JVS100, which is a non-viral plasmid that encodes for stromal cell-derived factor-1 (SDF-1). NanoCor (BNP delivery of I1), VentriNova (cyclin A2), and Beat BioTherapeutics (AAV/R1R2) are in the preclinical testing of their gene therapy product candidates for the treatment of heart failure. These companies also compete with us in recruiting human capital and securing licenses to complementary technologies that may be critical to the success of our business. They also compete with us for potential funding from the biotechnology and pharmaceutical industries. Our potential competitors also include academic institutions, government agencies and research institutions. In addition, as the presence of pre-existing NAbs against the proteins that encapsulate the AAV1 gene therapy agent can block entry of the AAV1 gene therapy agents into their target cells, previous patient exposure to other AAV1-based gene therapies, irrespective of the condition or disease they aim to treat, would render a patient ineligible for MYDICAR therapy and could therefore be considered competitive to MYDICAR.

We believe that the key competitive factors that will affect the development and commercial success of MYDICAR and any other product candidates that we develop are efficacy, safety and tolerability profile, convenience in dosing, product labeling, value, price and the availability of reimbursement from the government and other third-parties. Our commercial opportunity could be reduced or eliminated if our competitors have products which are better in one or more of these categories.

Intellectual Property

We strive to protect and enhance the proprietary technologies that we believe are important to our business, and seek to obtain and maintain patents for any patentable aspects of our products or product candidates, including our companion diagnostic, their methods of use and any other inventions that are important to the development of our business. Our success will depend significantly on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business, defend and enforce our patents, maintain our licenses to use intellectual property owned by third parties, preserve the confidentiality of our trade secrets and operate without infringing the valid and enforceable patents and other proprietary rights of third parties. We also rely on know-how, continuing technological innovation and in-licensing opportunities to develop, strengthen, and maintain our proprietary position in the fields targeted by our product candidates.

We are the owner or licensee of a portfolio of patents and patent applications and possess substantial know-how and trade secrets which protect various aspects of our business. The patent families comprising our patent portfolio are primarily focused on MYDICAR for the treatment of heart failure and are generally directed to certain genes, AAV vectors and methods of delivering such AAV vectors to cells, methods of delivery to myocardial cells and processes to manufacture our product candidates. We intend to leverage the intellectual property surrounding MYDICAR, together with the 12 years of available regulatory exclusivity that we expect to receive under the Biologics Price Competition and Innovation Act, as an important component of our business strategy.

Patent Protection for MYDICAR

Our portfolio of patents and patent applications related to MYDICAR generally relates to three aspects of MYDICAR: use of the SERCA2a gene for the treatment of heart failure; use and delivery of AAV vectors as a therapy; and manufacture of AAV vectors. The patent families which we believe are important for the protection of MYDICAR after its expected approval are summarized below. See also "—License Agreements."

- *Delivery of AAV Vectors to the Heart as a Therapy*. We are the sole owner of two patent families related to a method of treating cardiovascular disease by infusion of a therapeutic nucleic acid, such as MYDICAR, into the coronary circulation over a specified period of time, either alone or optionally with a vasodilating substance such as nitroglycerine. One patent has issued from these families (U.S. Patent No. 8,221,738), which includes claims to the use of a vasodilator in conjunction with MYDICAR. This patent is expected to expire in March 2030. We are currently prosecuting other method of use applications, and we expect that additional patents will issue from this family. If issued, these patents would expire between 2027 and 2028, excluding any potential additional term that may be available as a result of patent term adjustments, or if we elect to seek patent term extensions, or PTEs, that may be available under the Hatch-Waxman Act.
- *Composition of MYDICAR*. MYDICAR utilizes a hybrid AAV vector, where the various components of the AAV vectors (capsid proteins and/or genetic material) are from different AAV serotypes. We in-licensed two patent families containing patent applications related to recombinant hybrid AAV vectors, the first via a sublicense from the University of Pennsylvania, or UPenn, under our license agreement with AmpliPhi (formerly Targeted Genetics), and the second from AskBio LLC, or AskBio. We expect that these patent families (U.S. Patent Nos. 6,759,237, 7,186,552 and 7,172,893) will expire in November 2019 and February 2021, and we expect to pay a royalty to UPenn and AskBio upon commercialization of MYDICAR.
- *Manufacture of AAV Vectors.* The manufacture and purification of the AAV vector used in MYDICAR is complicated and requires technical know-how. Our manufacturing process technology is protected by patents, trade secrets and proprietary know-how. We have obtained an exclusive license from AmpliPhi for certain aspects of the AAV manufacturing technology related to MYDICAR. This includes licenses to several patent families covering products and methods of manufacturing AAV vectors, including patent families related to stably transfected host cells for production of AAV vectors,

and methods for commercial scale manufacturing and purification of recombinant AAV vectors. Taken in conjunction with our proprietary know-how, these patents are expected to offer additional protection by restricting competitors' access to AAV manufacturing methods used to make MYDICAR or competing AAV-based products. In the United States, these patents (U.S. Patent Nos. 6,566,118, 6,989,264, 6,995,006 and 6,475,769) are expected to expire in September 2018. A patent family related to improved methods for purification of AAV vectors (WO 2010/148143) is pending in the United States and several foreign countries, and any resulting patents are expected to expire in June of 2030.

- *Use of SERCA2a for the Treatment of Heart Failure.* We are developing MYDICAR for the treatment or prevention of heart failure through the use of AAV vectors to deliver the SERCA2a gene to improve cardiac function. We have licensed certain patent rights (U.S. Patent Nos. 6,605,274 and 7,745,416) related to gene therapy for the purpose of increasing SERCA2a expression in the treatment of heart failure, which have been important in the development of our product candidates, but these patent rights are expected to expire in 2015 prior to our anticipated approval of MYDICAR.

International Patent Protection for MYDICAR

We are the owner or licensee of numerous patents and patent applications in jurisdictions outside the United States. Most of the patent families discussed above have issued or are pending in foreign jurisdictions, including Australia, Canada, Europe and Japan. The term of issued patents in these jurisdictions is expected to expire between 2013 and 2028. Depending on the applicable national laws, these patents and patent applications (if applicable) covering MYDICAR may also benefit from extensions of patent term in individual countries.

Trade Secret Protection for MYDICAR

We exclusively in-license certain trade secret technology and know-how for manufacturing the AAV vector used in MYDICAR under our 2012 agreement with AmpliPhi. We believe that the expertise and materials licensed to us provide us with a commercial advantage over competitors attempting to utilize an AAV vector in their products.

U.S. Regulatory Protection for MYDICAR

In addition to patent and trade secret protection, we expect to receive a 12-year period of regulatory exclusivity from the FDA upon approval of MYDICAR pursuant to the Biologics Price Competition and Innovation Act. The exclusivity period, if granted, will run from the time of FDA approval. This exclusivity period, if granted, will supplement the intellectual property protection discussed above, providing an additional barrier to entry of any competitor seeking approval for a biosimilar version of MYDICAR.

In addition, it is possible to extend the patent term of one patent covering MYDICAR following FDA approval. This PTE is intended to compensate a patent owner for the loss of patent term during the FDA approval process. If eligible, we may use a PTE to extend the term of one of the patents discussed above beyond the expected expiration date, providing additional protection for MYDICAR.

Patent Protection of Pipeline Products

While the majority of our patent portfolio is related to MYDICAR and its use for treating heart failure, we are the owner or licensee of several additional patent families which relate to other technology which we are developing, including our small molecule program. This includes treatments for additional indications using SERCA enzymes and MYDICAR, and new drugs for treating other SERCA-related diseases.

- *Methods of Treating Stenosis*. We in-license patent family related to using SERCA2a genes, including delivery by AAV vectors, to reduce stenosis, which is the narrowing of a blood vessel, or restenosis, which is the repeated narrowing in blood vessels. We expect that these patents (U.S. Patent Nos. 7,291,604 and 8,133,878) will expire no earlier than September 2024.

- *Methods of Treating Pulmonary Arterial Hypertension*. We are the co-owner of a patent family containing patent applications (U.S. Patent Pub. 2011/0256101) related to the use of genes, including SERCA, to treat pulmonary arterial hypertension, a type of high blood pressure that affects the arteries in the lungs and the right side of the heart. These applications are currently in prosecution, and we expect that any patents that may issue from this family of patent applications will expire no earlier than April 2031.
- *Methods of Treating Heart Arrhythmia*. We in-license a patent family containing patent applications (U.S. Patent Pub. 2009/0239940) assigned to the U.S. National Institutes of Health which disclose methods and materials for treating heart disease, including heart arrhythmia, using SERCA2a and AAV vectors. We expect that any patents which issue from this family of patent applications will expire no earlier than July 2018.
- *Activation of SERCA2a using Zinc Finger Technology*. We are the sole owner of a patent family containing a patent application (U.S. Patent Pub. 2011/0172144) related to the use of a class of proteins known as zinc finger proteins to augment the expression of SERCA2a in cardiac muscle. Filed in January of 2011, we expect that any patent which issues from this application will expire no earlier than January of 2031.
- *High-throughput Screening for SERCA Modulators and Their Use*. We are the co-owner, with The Regents of the University of Minnesota, or UMinn, of patent families (U.S. Patent No. 8,431,356, and WO 2010/088450) that relate to high-throughput screening methods used to identify small molecule compounds that modulate SERCA activity, as well as their use in treating SERCA-related disease. We are solely responsible for the prosecution of these patents. We plan to use this technology to help identify product candidates which can be used to increase SERCA activity in muscle tissue, including the heart, to build a pipeline of SERCA-related therapies. We expect patents that may issue from these patent families to expire no earlier than January 2030.

Trademarks

We have registered the trademark “MYDICAR” in the United States for use in connection with a biological product, namely, a gene transfer product composed of a recombinant AAV vector for medical use. We intend to pursue additional registrations in markets outside the United States where we plan to sell MYDICAR.

Patent Term

The term of individual patents and patent applications listed in previous sections will depend upon the legal term of the patents in the countries in which they are obtained. In most countries, the patent term is 20 years from the date of filing of the patent application (or parent application, if applicable). For example, if an international Patent Cooperation Treaty, or PCT, application is filed, any patent issuing from the PCT application in a specific country expires 20 years from the filing date of the PCT application. In the United States, however, if a patent was in force on June 8, 1995, or issued on an application that was filed before June 8, 1995, that patent will have a term that is the greater of 20 years from the filing date, or 17 years from the date of issue.

Under the Hatch-Waxman Act, the term of a patent that covers an FDA-approved drug or biological product may also be eligible for PTE. PTE permits restoration of a portion of the patent term of a U.S. patent as compensation for the patent term lost during product development and the FDA regulatory review process if approval of the application for the product is the first permitted commercial marketing of a drug or biological product containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of an IND and the submission date of a BLA plus the time between the submission date of a BLA and the approval of that application. The Hatch-Waxman Act permits a PTE for only one patent applicable to an approved drug, and the maximum period of restoration is five years beyond the expiration of the patent. A PTE cannot extend the remaining term of a patent beyond a total of 14 years from the date of product

approval, and a patent can only be extended once, and thus, even if a single patent is applicable to multiple products, it can only be extended based on one product. Similar provisions may be available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug. When possible, depending upon the length of clinical trials and other factors involved in the filing of a BLA, we expect to apply for PTEs for patents covering our product candidates and their methods of use.

For additional information on PTE, see “Business—Government Regulation.”

Proprietary Rights and Processes

We may rely, in some circumstances, on proprietary technology and processes (including trade secrets) to protect our technology. However, these can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with those who have access to our confidential information, including our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our proprietary technology and processes by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our proprietary technology and processes may otherwise become known or be independently discovered by competitors. To the extent that our employees, consultants, scientific advisors, contractors, or any future collaborators use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions. For this and more comprehensive risks related to our proprietary technology and processes, please see “Risk Factors—Risks related to our intellectual property.”

License Agreements

License Agreement with The Regents of the University of California

In February 2001, we entered into a license agreement with The Regents of the University of California, or UC, under which we obtained an exclusive, worldwide license to UC’s patent rights in certain inventions, or the UC Patent Rights, related to the use of gene therapy vectors to deliver the SERCA2a gene to improve cardiac function, including certain patents related to MYDICAR. The agreement was amended twice, once in March 2001 to modify certain financial terms and once in January 2005 to make further amendments to the financial terms, with the second amendment also adding additional patents. We paid to UC an amendment fee of $114,455 and reimbursed UC for approximately $86,000 of previously incurred patent costs relating to the UC Patent Rights in connection with the second amendment of the agreement in January 2005.

Under the agreement, we are permitted to research, develop, manufacture and commercialize products utilizing the UC Patent Rights for gene therapy for the treatment or prevention of heart failure by the delivery of a gene or a synthetic equivalent, including SERCA2a, and to sublicense such rights. UC retained the right, on behalf of itself and other non-profit institutions, to use the UC Patent Rights for educational and research purposes and to publish information about the inventions covered by the UC Patent Rights.

In consideration for the rights granted to us under the agreement, we issued an aggregate of 1,045 shares of our common stock (taking into account the effect of a 1-for-100 reverse split of our capital stock that occurred in January 2012) to UC upon the achievement of certain developmental milestones. We are required to issue to UC an additional 696 shares of our common stock (taking into account the effect of a 1-for-100 reverse split of our capital stock that occurred in January 2012) and pay to UC up to an aggregate of approximately $1.6 million upon the achievement of certain developmental and regulatory milestones. In addition, upon commercialization of any product utilizing the UC Patent Rights, we will be required to pay to UC a low single-digit royalty on net sales of such product sold by us or our affiliates subject to minimum annual royalty payments and other adjustments in certain circumstances. However, we do not expect to commercialize MYDICAR prior to the

expiration of the UC Patent Rights applicable to MYDICAR, and our obligation to pay milestones and royalties to UC terminates upon the expiration of the applicable UC Patent Rights.

In the event we sublicense a UC Patent Right, we are obligated to pay to UC a fee based on a percentage of sublicense fees received by us, which percentage ranges from the low-teens to mid-twenties depending on the country of origin of such UC Patent Right and is subject to adjustment in certain circumstances. In addition, we will also be required to pay to UC a low single-digit percentage sublicense royalty on net sales of products sold by our sublicensees that utilize the sublicensed UC Patent Right, but in no event will we be required to pay more than 50% of the royalties we receive from such sublicensees.

The agreement requires that we diligently develop, manufacture and commercialize products that are covered by the UC Patent Rights, and we have agreed to meet certain developmental and commercial milestones. UC may, at its option, either terminate the agreement or change the license granted from an exclusive license to a non-exclusive license if we fail to meet such milestones. We are currently in compliance with these milestone requirements.

We may unilaterally terminate the agreement for any reason upon 90 days' written notice to UC. UC may terminate the agreement in the event of our nonperformance or breach of the agreement if such nonperformance or breach remains uncured for 60 days following our receipt of written notice of such nonperformance or breach. Absent early termination, the agreement will continue until the expiration date of the longest-lived patent right included in the UC Patent Rights.

Exclusive License Agreement with Dr. Martin J. Kaplitt

In June 2006, we entered into an exclusive license agreement with Dr. Martin J. Kaplitt pursuant to which Dr. Kaplitt granted to us an exclusive, worldwide license under Dr. Kaplitt's interest in certain patents related to the use of AAV vectors to deliver genes to cardiac muscles and delivery methods of AAV vectors to heart cells for the development, manufacture, use and sale of MYDICAR. The license granted to us under the agreement automatically became non-exclusive on the fourth anniversary of the effective date of the agreement. We have the right to grant sublicenses to third parties under the agreement.

In consideration for the rights granted to us under the agreement, we paid an upfront fee to Dr. Kaplitt of $25,000. We are also obligated to pay to Dr. Kaplitt an annual license maintenance fee of $6,000 during the term of the agreement. In addition, we are required to pay to Dr. Kaplitt a very low single-digit percentage royalty on net sales of products sold by us, our affiliates and our sublicensees that are covered by the licensed patents. Our royalty obligations continue on a product-by-product and country-by-country basis until the expiration of the last-to-expire valid claim in the licensed patents covering a licensed product in such country. Finally, we are obligated to pay to Dr. Kaplitt up to an aggregate of $200,000 upon the achievement of certain regulatory milestones.

We may unilaterally terminate the agreement upon 60 days' written notice to Dr. Kaplitt. Dr. Kaplitt may terminate the agreement in the event of our material breach of the agreement if such breach remains uncured for 60 days following our receipt of written notice of such breach. Absent early termination, the agreement will automatically terminate upon the expiration of the last-to-expire of the licensed patents containing a valid claim, which is expected to be in 2015, prior to the projected launch of our product candidates.

Sublicense Agreement and Amended and Restated License Agreement with AmpliPhi

Sublicense Agreement

In June 2012, we entered into a sublicense agreement with AmpliPhi, or the AmpliPhi Sublicense, pursuant to which AmpliPhi sublicensed to us certain rights under a separate agreement, the UPenn Agreement, which AmpliPhi entered into in 2009 with the Trustees of UPenn. Under the terms of the agreement, we obtained an exclusive, worldwide sublicense from AmpliPhi under certain UPenn patents related to AAV1 vectors for the

development, manufacture, use and sale of companion diagnostics to MYDICAR. We have the right to grant sublicenses to our affiliates and third-party collaborators under the agreement solely for research, development or other non-commercial purposes, or as reasonably necessary, to our manufacturers or distributors, provided that we remain primarily liable and such downstream sublicenses are consistent with the terms of our agreement with AmpliPhi and prohibit further sublicensing. In addition, we are required to use commercially reasonable efforts to meet certain developmental, regulatory and commercial milestones with respect to companion diagnostics under the agreement. We are currently in compliance with these milestone requirements. While we have sole control over the development and commercialization of companion diagnostics under the agreement, AmpliPhi has the first right to prosecute and maintain the licensed patents, subject to our right to consult with AmpliPhi with regard to such prosecution and maintenance upon our reasonable request.

In consideration for the sublicense granted to us under the agreement, we paid to AmpliPhi a sublicense initiation fee of $310,000, and we are obligated to pay to AmpliPhi an annual sublicense maintenance fee of $310,000. We are also required to pay to AmpliPhi a low single-digit percentage royalty based on net sales of any companion diagnostic covered by a licensed patent sold by us, our affiliates or our sublicensees. Our royalty obligations continue on a companion diagnostic-by-companion diagnostic and country-by-country basis until the expiration of the last-to-expire valid claim in a licensed patent covering the applicable companion diagnostic in such country. Finally, we are obligated to pay to AmpliPhi all royalty and milestone payments that become due and payable by AmpliPhi to UPenn under the UPenn Agreement as a result of our exercise of the sublicense granted under our agreement with AmpliPhi, including a low single-digit tiered percentage royalty on net sales of any companion diagnostic sold by us, our affiliates or our sublicensees and up to an aggregate of $850,000 in potential milestone payments per product covered by the licensed patents.

We may unilaterally terminate the agreement upon 30 days' written notice to AmpliPhi. Absent early termination, the agreement will automatically terminate upon the expiration of the last-to-expire licensed patent, which is expected to be in 2019.

Amended and Restated License Agreement

We entered into an amended and restated license agreement with AmpliPhi concurrently with the AmpliPhi Sublicense that both amended the terms of the license agreement which we entered into with AmpliPhi in 2009 and terminated our manufacturing agreement with AmpliPhi which we entered into in 2009. Under the agreement, we obtained an exclusive, worldwide license under certain patents and know-how related to AmpliPhi's AAV vector and manufacturing technology for the development, manufacture, use and sale of MYDICAR. We have the right to grant sublicenses to our affiliates and third-party collaborators under the agreement for research, development or other non-commercial purposes, or as reasonably necessary, to our manufacturers or distributors, provided that we remain primarily liable and such sublicenses comply with the terms of our agreement with AmpliPhi and prohibit further sublicensing. In addition, we have agreed to use commercially reasonable efforts to meet certain diligence milestones with respect to the development and commercialization of at least one product covered by the UPenn patent rights licensed to AmpliPhi by UPenn under the UPenn Agreement. We are currently in compliance with these milestone requirements. While we have sole control over development and commercialization of products covered by the licensed patents, AmpliPhi has the first right to prosecute and maintain the licensed patents, subject to our right to consult with AmpliPhi with regard to such prosecution and maintenance upon our reasonable request.

During the term of the agreement, we are obligated to pay to AmpliPhi all royalty and milestone payments that become due and payable by AmpliPhi to UPenn under the UPenn Agreement as a result of our exercise of the sublicense granted under our agreement with AmpliPhi. This includes a low single-digit tiered percentage royalty on net sales of MYDICAR and any other product covered by the licensed patents sold by us, our affiliates or our sublicensees, and up to $850,000 in milestone payments upon the achievement of certain developmental and regulatory milestones related to MYDICAR and any other product covered by the licensed patents.

The agreement does not provide either party with termination rights and does not have a provision for expiration or automatic termination.

License Agreement with AdVec

In February 2009, we entered into a license agreement with AdVec, Inc., or AdVec, under which we obtained a non-exclusive, worldwide license to use and acquire from AdVec's distributor certain human embryo kidney cells transformed by Adenovirus 5 DNA, or 293 Cells, and certain AdVec know-how related to 293 Cells for use in testing of MYDICAR for lot release. In consideration for the rights granted to us under the agreement, we are obligated to pay to AdVec an annual license maintenance fee of $5,000.

Either party may terminate the agreement upon written notice of the other party's insolvency or bankruptcy or upon the other party's breach of the agreement if such breach remains uncured after 60 days of receipt of written notice of such breach. Absent early termination, the agreement will remain in effect until the tenth anniversary of the effective date. Thereafter, the agreement will automatically renew for successive five-year terms unless either party notifies the other party in writing at least 90 days prior to the end of any such five-year term of its election not to renew the agreement.

Non-Exclusive License Agreement with Virovek

In November 2010, we entered into a non-exclusive license agreement with Virovek Incorporation, or Virovek, under which we obtained a non-exclusive, worldwide license under certain patent rights and trade secrets related to Virovek's AAV baculovirus technology to develop, manufacture, use and sell AAV1/GFP vector reagents as part of a companion diagnostic. Under the terms of the agreement, we have the right to grant sublicenses to third parties, and we are required to use commercially reasonable efforts to develop and commercialize a companion diagnostic to MYDICAR. We are currently in compliance with this requirement.

In consideration for the rights granted to us under the agreement, we paid to Virovek an up-front license fee of $15,000, and we are obligated to pay to Virovek an annual maintenance fee of $20,000, which fee is creditable against royalties due under the agreement. We are also required to pay to Virovek a percentage royalty in the mid-teen range based on upfront, annual, milestone, royalty and other payments received by us as a result of the performance of companion diagnostics by us, our affiliates and our sublicensees, subject to adjustment in certain circumstances. Our royalty obligations continue on a companion diagnostic-by-companion diagnostic and country-by-country basis until the expiration of the last-to-expire valid claim in a licensed patent covering the companion diagnostic in such country, or 10 years from the date of first commercial sale in such country if the companion diagnostic is covered only by licensed trade secrets.

We may unilaterally terminate the agreement upon 60 days' notice to Virovek. Either party may terminate the agreement for the other party's material breach of the agreement if such breach remains uncured after 90 days of receiving written notice of such breach. Absent early termination, the agreement will automatically terminate upon the expiration of our royalty payment obligations.

Non-Exclusive License Agreement with AskBio

In January 2008, we entered into a non-exclusive license agreement with AskBio, a wholly-owned subsidiary of Asklepios Biopharmaceutical Inc., under which we obtained a non-exclusive, worldwide license under certain patents related to recombinant AAV vectors to develop, manufacture, use and sell MYDICAR. We have the right to grant sublicenses to third parties under the agreement provided that such sublicenses are entered into pursuant to a written sublicense agreement containing terms consistent with our agreement with AskBio.

Under the terms of the agreement, we granted to AskBio an option to obtain a non-exclusive, worldwide license under certain of our patent rights related to infusion of AAV in the arteries of the heart to develop,

manufacture, use and sell products for the treatment of cardiac diseases. This option includes our currently pending patent application related to a method of treating cardiovascular disease by infusion of a therapeutic nucleic acid into the coronary circulation over a specified period of time. It does not include our issued patent in this family, which includes claims to the concurrent use of a vasodilating substance such as nitroglycerine. If AskBio timely exercises its option to obtain the license under the agreement on or before the earlier of January 15, 2015 and within 60 days following notice that a patent has issued from the patent applications included within the patent rights subject to the option, we will enter into a separate license agreement with AskBio with respect to such license with previously agreed upon payment terms. Although the scope of the license granted to AskBio upon exercise of the option would enable AskBio to develop and commercialize a competing product with respect to the patent rights to which the option applies, we believe that the exclusion of our issued patent from that license, and the scope of our anticipated regulatory approvals, will prevent AskBio from being able to launch any product that is able to compete directly with MYDICAR.

In consideration for the rights granted to us under the agreement, we paid to AskBio license fee payments of $150,000 in the aggregate. In addition, we are obligated to pay to AskBio an annual maintenance fee of $100,000. Upon commercialization of any product utilizing the licensed patents, we will also be required to pay to AskBio a low single-digit percentage royalty on net sales of such products, including MYDICAR. Our royalty obligations continue on a product-by-product and country-by-country basis until the expiration of the last-to-expire valid claim in a licensed patent covering the applicable product in such country, which is expected to be in 2021. We are also obligated to reimburse AskBio for up to an aggregate of $355,000 upon the achievement of certain clinical, regulatory and sales milestones that may become due and payable by AskBio under a separate agreement between AskBio and the University of North Carolina at Chapel Hill from 2003.

We may unilaterally terminate the agreement upon 180 days' written notice to AskBio. Either party may terminate the agreement for the other party's material breach of the agreement if such breach is not cured after 30 days of receiving written notice of such breach. Absent early termination, the agreement will continue in effect until the expiration of our royalty payment obligations under the agreement.

Exclusive Patent License with the Regents of the University of Minnesota

We are joint owners with UMinn of the rights in a certain patent related to screening technology for isolation of small molecule modulators of SERCA enzymes (fluorescence resonance energy transfer, or FRET, assays). In May 2009, we entered into an exclusive patent license agreement with UMinn under which we obtained an exclusive license to UMinn's joint ownership interest in the patent application that led to the current issued patent. We have the right to grant sublicenses to third parties under the agreement, and UMinn retained the right to use the licensed technology for non-commercial research and educational purposes.

We have agreed to meet certain performance milestones under the agreement, the deadline for which may be extended at our request provided that we have used commercially reasonable efforts to achieve such milestones by the applicable deadlines. We are currently in compliance with these milestone requirements. We have the first right to prosecute and maintain the applicable patent family.

In consideration for the rights granted to us under the agreement, we made an upfront payment to UMinn of $120,000. In addition, we are obligated to pay to UMinn an annual license fee of $120,000. The annual license fee will increase to $325,000 if we (1) undergo a change of control, (2) assign the agreement, any of our rights or obligations under the agreement or our joint ownership interest in the licensed technology, (3) receive a certain amount in license and sublicense revenues under the agreement, (4) file an investigational new drug application, or IND, new drug application, or NDA, BLA or orphan drug application (or a foreign equivalent of any such application) for a product covered by the licensed technology, or (5) enter into any agreement with a third party to market or use the licensed technology, subject to certain exceptions.

We may unilaterally terminate the agreement upon 90 days' written notice to UMinn. UMinn may terminate the agreement upon 10 days' written notice to us upon our insolvency or for our breach of the agreement if such

breach remains uncured for 90 days after we receive notice of such breach, or 30 days in the case of a non-payment breach. Absent early termination, the agreement will automatically terminate upon the expiration of all active claims in any licensed patent or patent application.

Manufacturing

Manufacturing Services Agreement with Lonza

In August 2012, we entered into a manufacturing services agreement with Lonza Houston, Inc., or Lonza, which we subsequently amended and restated in August 2013. Under the terms of the agreement, Lonza provides manufacturing services to produce MYDICAR at a scale sufficient for our clinical trials to date. We pay for manufacturing services performed by Lonza under the agreement pursuant to statements of work entered into from time to time.

We may unilaterally terminate the agreement upon six months' written notice to Lonza. Lonza may terminate the agreement upon written notice to us, provided that such termination by Lonza will not be effective until the earlier of one year after the date we receive such written notice or our qualification of an alternative supplier and completion of certain technology transfer assistance services to establish manufacturing capabilities at the alternative supplier's facilities. Either party may terminate the agreement in the event of the other party's insolvency or for the other party's material breach of the agreement if such breach remains uncured after 30 days of receiving written notice of such breach or after 180 days of receiving written notice of such breach if such breach is not a non-payment related breach, is not capable of being cured within 30 days and the breaching party is making diligent efforts to cure such breach. In addition, either party may terminate the agreement, by providing two months' written notice to the other party if it receives notice that the production of MYDICAR under the agreement or clinical trials for which MYDICAR is being produced has been or will be suspended or terminated by the FDA or EMA due to product failure. Absent early termination, the agreement will continue until the fifth anniversary of the effective date of the original agreement.

We have also entered into a non-binding letter of intent with Lonza, pursuant to which both parties have agreed to work in good faith to negotiate a definitive agreement for the commercial manufacture of MYDICAR in the event we desire to commence commercial scale manufacture of MYDICAR.

Government Regulation

Biological products, including gene therapy products, are subject to regulation under the Federal Food, Drug, and Cosmetic Act, or FD&C Act, and the Public Health Service Act, or PHS Act, and other federal, state, local and foreign statutes and regulations. Both the FD&C Act and the PHS Act and their corresponding regulations govern, among other things, the testing, manufacturing, safety, purity, potency, efficacy, labeling, packaging, storage, record keeping, distribution, reporting, advertising and other promotional practices involving biological products. FDA approval must be obtained before clinical testing of a biological product begins, and each clinical trial protocol for a gene therapy product is reviewed by the FDA and, in some instances, the U.S. National Institutes of Health, or NIH, through its Recombinant DNA Advisory Committee, or RAC. FDA approval also must be obtained before marketing of biological products. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources and we may not be able to obtain the required regulatory approvals. To date, the FDA has never approved a gene therapy product for commercial sale.

Within the FDA, the Center for Biologics Evaluation and Research, or CBER, regulates gene therapy products. CBER works closely with the NIH and its RAC, which makes recommendations to the NIH on gene therapy issues and engages in a public discussion of scientific, safety, ethical and societal issues related to proposed and ongoing gene therapy protocols. The FDA and the NIH have published guidance documents with respect to the development and submission of gene therapy protocols. The FDA also has published guidance

documents related to, among other things, gene therapy products in general, their preclinical assessment, observing subjects involved in gene therapy studies for delayed adverse events, potency testing and chemistry, manufacturing and control information in gene therapy INDs.

Ethical, social and legal concerns about gene therapy, genetic testing and genetic research could result in additional regulations restricting or prohibiting the processes we may use. Federal and state agencies, congressional committees and foreign governments have expressed interest in further regulating biotechnology. More restrictive regulations or claims that our products are unsafe or pose a hazard could prevent us from commercializing any products. New government requirements may be established that could delay or prevent regulatory approval of our product candidates under development. It is impossible to predict whether legislative changes will be enacted, regulations, policies or guidance changed, or interpretations by agencies or courts changed, or what the impact of such changes, if any, may be.

U.S. Biological Products Development Process

The process required by the FDA before a biological product may be marketed in the United States generally involves the following:

- completion of nonclinical laboratory tests and animal studies according to good laboratory practices, or GLPs, and applicable requirements for the humane use of laboratory animals or other applicable regulations;
- submission to the FDA of an IND application, which must become effective before human clinical trials may begin;
- performance of adequate and well-controlled human clinical trials according to the FDA's regulations, commonly referred to as good clinical practices, or GCPs, and any additional requirements for the protection of human research subjects and their health information, to establish the safety and efficacy of the proposed biological product for its intended use;
- submission to the FDA of a BLA for marketing approval that includes substantive evidence of safety, purity and potency from results of nonclinical testing and clinical trials;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities where the biological product is produced to assess compliance with GMP, to assure that the facilities, methods and controls are adequate to preserve the biological product's identity, strength, quality and purity and, if applicable, the FDA's current good tissue practices, or GTPs, for the use of human cellular and tissue products;
- potential FDA audit of the nonclinical study and clinical trial sites that generated the data in support of the BLA; and
- FDA review and approval, or licensure, of the BLA.

Before testing any biological product candidate, including a gene therapy product, in humans, the product candidate enters the preclinical testing stage. Preclinical tests, also referred to as nonclinical studies, include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the preclinical tests must comply with federal regulations and requirements including GLPs.

Where a gene therapy trial is conducted at, or sponsored by, institutions receiving NIH funding for recombinant DNA research, prior to the submission of an IND to the FDA, a protocol and related documentation is submitted to and the trial is registered with the NIH Office of Biotechnology Activities, or OBA, pursuant to the NIH Guidelines for Research Involving Recombinant DNA Molecules, or NIH Guidelines. Compliance with the NIH Guidelines is mandatory for investigators at institutions receiving NIH funds for research involving recombinant DNA, however many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. The NIH is responsible for convening the RAC, a federal advisory committee, which

discusses protocols that raise novel or particularly important scientific, safety or ethical considerations at one of its quarterly public meetings. The OBA will notify the FDA of the RAC's decision regarding the necessity for full public review of a gene therapy protocol. RAC proceedings and reports are posted to the OBA website and may be accessed by the public.

The clinical trial sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some preclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA places the trial on a clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. With gene therapy protocols, if the FDA allows the IND to proceed, but the RAC decides that full public review of the protocol is warranted, the FDA will request at the completion of its IND review that sponsors delay initiation of the protocol until after completion of the RAC review process. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, trials may not recommence without FDA authorization and then only under terms authorized by the FDA. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such trials.

Clinical trials involve the administration of the biological product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety, including stopping rules that assure a clinical trial will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations comprising the GCP requirements, including the requirement that all research subjects provide informed consent. Further, each clinical trial must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical trial will be conducted. An IRB is charged with protecting the welfare and rights of trial participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. Clinical trials also must be reviewed by an institutional biosafety committee, or IBC, a local institutional committee that reviews and oversees basic and clinical research conducted at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment.

Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- *Phase 1*. The biological product is initially introduced into healthy human subjects and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.
- *Phase 2*. The biological product is evaluated in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance, optimal dosage and dosing schedule.
- *Phase 3*. Clinical trials are undertaken to further evaluate dosage, clinical efficacy, potency, and safety in an expanded patient population at geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the product and provide an adequate basis for product labeling.

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in

the intended therapeutic indication, particularly for long-term safety follow-up. The FDA recommends that sponsors observe subjects for potential gene therapy-related delayed adverse events for a 15-year period, including a minimum of five years of annual examinations followed by ten years of annual queries, either in person or by questionnaire, of trial subjects.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data, and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA, the NIH and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or *in vitro* testing that suggest a significant risk for human subjects, or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk, including risks inferred from other unrelated gene therapy trials. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to patients.

Human gene therapy products are a new category of therapeutics. Because this is a relatively new and expanding area of novel therapeutic interventions, there can be no assurance as to the length of the trial period, the number of patients the FDA will require to be enrolled in the trials in order to establish the safety, efficacy, purity and potency of human gene therapy products, or that the data generated in these trials will be acceptable to the FDA to support marketing approval. The NIH and the FDA have a publicly accessible database, the Genetic Modification Clinical Research Information System which includes information on gene transfer studies and serves as an electronic tool to facilitate the reporting and analysis of adverse events on these studies.

Concurrently with clinical trials, companies usually complete additional animal studies and must also develop additional information about the physical characteristics of the biological product as well as finalize a process for manufacturing the product in commercial quantities in accordance with GMP requirements. To help reduce the risk of the introduction of adventitious agents with use of biological products, the PHS Act emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Review and Approval Processes

After the completion of clinical trials of a biological product, FDA approval of a BLA must be obtained before commercial marketing of the biological product. The BLA must include results of product development, laboratory and animal studies, human trials, information on the manufacture and composition of the product, proposed labeling and other relevant information. The FDA may grant deferrals for submission of data or full or partial waivers. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a significant user fee. The FDA adjusts the PDUFA user fees on an annual basis. PDUFA also imposes an annual

product fee for biological products and an annual establishment fee on facilities used to manufacture prescription biological products. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the agency accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the BLA. The FDA reviews the BLA to determine, among other things, whether the proposed product is safe and potent, or effective, for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with GMP to assure and preserve the product's identity, safety, strength, quality, potency and purity. The FDA may refer applications for novel biological products or biological products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. During the biological product approval process, the FDA also will determine whether a Risk Evaluation and Mitigation Strategy, or REMS, is necessary to assure the safe use of the biological product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve a BLA without a REMS, if required.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with GMP requirements and adequate to assure consistent production of the product within required specifications. For a gene therapy product, the FDA also will not approve the product if the manufacturer is not in compliance with the GTPs, to the extent applicable. These are FDA regulations and guidance documents that govern the methods used in, and the facilities and controls used for, the manufacture of human cells, tissues, and cellular and tissue based products, or HCT/Ps, which are human cells or tissue intended for implantation, transplant, infusion, or transfer into a human recipient. The primary intent of the GTP requirements is to ensure that cell- and tissue-based products are manufactured in a manner designed to prevent the introduction, transmission and spread of communicable disease. FDA regulations also require tissue establishments to register and list their HCT/Ps with the FDA and, when applicable, to evaluate donors through screening and testing. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure that the clinical trials were conducted in compliance with IND trial requirements and GCP requirements. To assure GMP, GTP and GCP compliance, an applicant must incur significant expenditure of time, money and effort in the areas of training, record keeping, production, and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the BLA does not satisfy its regulatory criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. If the agency decides not to approve the BLA in its present form, the FDA will issue a complete response letter that describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the application in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the

product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require post marketing clinical trials, sometimes referred to as Phase 4 clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized.

The FDA has agreed to certain review goals under PDUFA, and aims to complete its review of 90% of standard BLAs within ten months from filing and 90% of priority BLAs within six months from filing. The FDA does not always meet its PDUFA goal dates for standard and priority BLAs and its review goals are subject to change from time to time. The review process and the PDUFA goal date may be extended by three months if the FDA requests, or the BLA sponsor otherwise provides, additional information or clarification regarding information already provided in the submission within the last three months before the PDUFA goal date.

Fast Track Designation, Accelerated Approval, Priority Review and Breakthrough Therapy Programs

The FDA has a Fast Track program that is intended to expedite or facilitate the process for reviewing new drugs and biological products that meet certain criteria. Specifically, new drugs and biological products are eligible for Fast Track designation if they are intended to treat a serious or life-threatening condition and demonstrate the potential to address unmet medical needs for the condition. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. The sponsor of a new drug or biological product may request the FDA to designate the drug or biological product as a Fast Track product at any time during the clinical development of the product. Unique to a Fast Track product, the FDA may consider for review sections of the marketing application on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the application, the FDA agrees to accept sections of the application and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the application.

Other types of FDA programs intended to expedite development and review, such as priority review, accelerated approval and Breakthrough Therapy designation, also exist. A product is eligible for priority review if it has the potential to provide safe and effective therapy where no satisfactory alternative therapy exists or a significant improvement in the treatment, diagnosis or prevention of a disease compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug or biological product designated for priority review in an effort to facilitate the review. Additionally, a product may be eligible for accelerated approval. Drug or biological products studied for their safety and effectiveness in treating serious or life-threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may receive accelerated approval, which means that they may be approved on the basis of adequate and well-controlled clinical trials establishing that the product has an effect on a surrogate endpoint that is reasonably likely to predict a clinical benefit, or on the basis of an effect on a clinical endpoint other than survival or irreversible morbidity. As a condition of approval, the FDA may require that a sponsor of a drug or biological product receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

A product may also be eligible for receipt of a Breakthrough Therapy designation. The Breakthrough Therapy designation is intended to expedite the FDA's review of a potential new drug for serious or life-threatening diseases where "preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development." The designation of a drug as a Breakthrough Therapy provides the same benefits as are available under the Fast Track program, as well as intensive FDA guidance on the product's development program. Fast Track designation, priority review, accelerated approval and Breakthrough Therapy designation do not change the standards for approval, but may expedite the development or approval process.

Post-approval Requirements

Maintaining substantial compliance with applicable federal, state and local statutes and regulations requires the expenditure of substantial time and financial resources. Rigorous and extensive FDA regulation of biological products continues after approval, particularly with respect to GMP. We will rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of any products that we may commercialize. Manufacturers of our products are required to comply with applicable requirements in the GMP regulations, including quality control and quality assurance and maintenance of records and documentation. Other post-approval requirements applicable to biological products include reporting of GMP deviations that may affect the identity, potency, purity and overall safety of a distributed product, record-keeping requirements, reporting of adverse effects, reporting updated safety and efficacy information, and complying with electronic record and signature requirements. After a BLA is approved, the product also may be subject to official lot release. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency and effectiveness of biological products.

We also must comply with the FDA's advertising and promotion requirements, such as those related to direct-to-consumer advertising, the prohibition on promoting products for uses or in patient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities, and promotional activities involving the internet. Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval, clinical hold, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Biological product manufacturers and other entities involved in the manufacture and distribution of approved biological products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with GMPs and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain GMP compliance. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer or holder of an approved BLA, including withdrawal of the product from the market. In addition, changes to the manufacturing process or facility generally require prior FDA approval before being implemented and other types of changes to the approved product, such as adding new indications and additional labeling claims, are also subject to further FDA review and approval.

Regulation of Companion Diagnostics

In the United States, the FD&C Act and its implementing regulations, and other federal and state statutes and regulations govern, among other things, medical device design and development, preclinical and clinical testing, premarket clearance or approval, registration and listing, manufacturing, labeling, storage, advertising and promotion, sales and distribution, export and import, and post-market surveillance. Companion diagnostic tests are classified as medical devices under the FD&C Act. Unless an exemption applies, diagnostic tests require marketing clearance or approval from the FDA prior to commercial distribution. The two primary types of FDA marketing authorization applicable to a medical device are premarket notification, also called 510(k) clearance, and PMA approval. We anticipate that the companion diagnostic tests we are developing will be subject to the PMA approval process.

PMA applications must be supported by valid scientific evidence, which typically requires extensive data, including technical, preclinical, clinical and manufacturing data, to demonstrate to the FDA's satisfaction the safety and effectiveness of the device. For diagnostic tests, a PMA application typically includes data regarding analytical and clinical validation studies. As part of its review of the PMA, the FDA will conduct a pre-approval inspection of the manufacturing facility or facilities to ensure compliance with the Quality System Regulation, or QSR, which requires manufacturers to follow design, testing, control, documentation and other quality assurance procedures. FDA review of an initial PMA application is required by statute to take between six to ten months, although the process typically takes longer, and may require several years to complete. If the FDA evaluations of both the PMA application and the manufacturing facilities are favorable, the FDA will either issue an approval letter or an approvable letter, which usually contains a number of conditions that must be met in order to secure the final approval of the PMA. If the FDA's evaluation of the PMA or manufacturing facilities is not favorable, the FDA will deny approval of the PMA or issue a not approvable letter. A not approvable letter will outline the deficiencies in the application and, where practical, will identify what is necessary to make the PMA approvable. The FDA may also determine that additional clinical trials are necessary, in which case the PMA approval may be delayed for several months or years while the trials are conducted and then the data submitted in an amendment to the PMA. Once granted, PMA approval may be withdrawn by the FDA if compliance with post approval requirements, conditions of approval or other regulatory standards is not maintained or problems are identified following initial marketing.

We and our third-party collaborators who may develop our companion diagnostics will work cooperatively to generate the data required for submission with the PMA application, and will remain in close contact with the Center for Devices and Radiological Health, or CDRH, at the FDA to ensure that any changes in requirements are incorporated into the development plans. We anticipate that, as was the case in our meetings to date, future meetings with the FDA with regard to MYDICAR and its companion diagnostic product candidate will include representatives from both the CBER and the CDRH to ensure that the BLA and PMA submissions are coordinated to enable the FDA to conduct a parallel review of both submissions. On July 14, 2011, the FDA issued for comment a draft guidance document addressing the development and approval process for "In Vitro Companion Diagnostic Devices." According to the draft guidance, for novel products such as MYDICAR, the PMA for a companion diagnostic device should be developed and approved contemporaneously with the biological product. While this draft guidance is not yet finalized, we believe our programs for the development of our companion diagnostics are consistent with the draft guidance as proposed.

Coverage and Reimbursement

Sales of our products will depend, in part, on the extent to which our products will be covered by third-party payors, such as government healthcare programs, commercial insurance and managed healthcare organizations. These third-party payors are increasingly reducing reimbursements for medical products and services. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results. Decreases in third-party reimbursement for our product candidates or a decision by a third-party payor to not cover our product candidates could reduce physician usage of our products once approved and have a material adverse effect on our sales, results of operations and financial condition.

Fraud and Abuse Laws

Although we currently do not have any products on the market, if MYDICAR, our companion diagnostic, or our other product candidates are approved and we begin commercialization, we may be subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which we conduct our business. Such laws include, without limitation, state and federal anti-kickback, false claims, privacy and security and physician sunshine laws and regulations. If our operations are

found to be in violation of any of such laws or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, the curtailment or restructuring of our operations, the exclusion from participation in federal and state healthcare programs and imprisonment, any of which could adversely affect our ability to operate our business and our financial results.

Additional Regulation

In addition to the foregoing, state and federal laws regarding environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws may affect our future operations.

U.S. Foreign Corrupt Practices Act

The U.S. Foreign Corrupt Practices Act, to which we are subject, prohibits corporations and individuals from engaging in certain activities to obtain or retain business or to influence a person working in an official capacity. It is illegal to pay, offer to pay or authorize the payment of anything of value to any foreign government official, government staff member, political party or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity.

Government Regulation Outside of the United States

In addition to regulations in the United States, we will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our products. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries.

Whether or not we obtain FDA approval for a product, we must obtain the requisite approvals from regulatory authorities in foreign countries prior to the commencement of clinical trials or marketing of the product in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical trial application much like the IND prior to the commencement of human clinical trials. In the European Union, for example, a CTA must be submitted to each country's national health authority and an independent ethics committee, much like the FDA and the IRB, respectively. Once the CTA is approved in accordance with a country's requirements, clinical trial development may proceed.

The requirements and process governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

To obtain regulatory approval of an investigational biological product under European Union regulatory systems, we must submit a marketing authorization application. The application used to file the BLA in the United States is similar to that required in the European Union, with the exception of, among other things, country-specific document requirements. The European Union also provides opportunities for market exclusivity. For example, in the European Union, upon receiving marketing authorization, new chemical entities generally receive eight years of data exclusivity and an additional two years of market exclusivity. If granted, data exclusivity prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application. During the additional two-year period of market exclusivity, a generic marketing

authorization can be submitted, and the innovator's data may be referenced, but no generic product can be marketed until the expiration of the market exclusivity. However, there is no guarantee that a product will be considered by the European Union's regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity.

The ten-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, marketing authorization may be granted to a similar product for the same indication at any time if:

- The second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior;
- The applicant consents to a second orphan medicinal product application; or
- The applicant cannot supply enough orphan medicinal product.

For other countries outside of the European Union, such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, again, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Employees

As of September 6, 2013, we had 12 full-time employees, consisting of research, process development, manufacturing, finance, administration and business development personnel. We also regularly use independent contractors across the organization to augment our regular staff. None of our employees are covered by collective bargaining agreements and we consider relations with our employees to be good. We believe that our future success will depend in part on our continued ability to attract, hire and retain qualified personnel.

Legal Proceedings

From time to time, we are involved in various legal proceedings arising in the ordinary course of our business. We are not presently a party to any legal proceedings the outcome of which, if determined adversely to us, would individually or in the aggregate have a material adverse effect on our business, operating results or financial condition.

Incorporation/Facilities

We were originally incorporated in California in December 2000. In April 2012, we reincorporated in Delaware. Our corporate headquarters are located at 12760 High Bluff Drive, Suite 240, San Diego, California 92130 in a facility we lease encompassing approximately 2,270 square feet of office space. The lease for this facility expires in November 2017.

MANAGEMENT

Executive Officers and Directors

The following table sets forth certain information regarding our current executive officers and directors:

Name	Age	Position(s)
Executive Officers		
Krisztina M. Zsebo, Ph.D.	57	President, Chief Executive Officer and Director
Rebecque J. Laba	51	Vice President, Finance and Administration
Jeffrey J. Rudy	51	Vice President, Clinical Operations
Ryan K. Takeya	44	Vice President, Manufacturing
Fredrik Wiklund	42	Vice President, Corporate Development and Investor Relations
Non-Employee Directors		
Barbara J. Dalton, Ph.D.(1)	60	Chairman of the Board of Directors
Gregg Alton(1)(3)	47	Director
Fouad Azzam, Ph.D.(4)	46	Director
Graham Cooper(2)(3)	43	Director
Todd Foley(2)	41	Director
Joshua Funder, Ph.D.(2)	42	Director
Johan Kördel, Ph.D. (1)	51	Director
Daniel R. Omstead, Ph.D.(4)	60	Director
Andrew E. Senyei, M.D.(4)	63	Director
Lauren Silverman, Ph.D.(3)	58	Director

(1) Member of the compensation committee
(2) Member of the audit committee
(3) Member of the nominating and corporate governance committee
(4) Dr. Azzam, Dr. Omstead and Dr. Senyei will each resign from our board of directors contingent and effective upon the closing of this offering

Executive Officers

Krisztina M. Zsebo, Ph.D. Dr. Zsebo has served as our President, Chief Executive Officer and a member of our board of directors since 2004. From March 2004 until October 2007, Dr. Zsebo was a venture partner at Enterprise Partners Venture Capital, a venture capital firm. Prior to joining Enterprise Partners, Dr. Zsebo held executive positions at Remedyne Corporation, a biotechnology company, Connetics Corporation, a specialty pharmaceutical company, ALZA Corporation, a pharmaceutical and medical systems company, Cell Genesys, Inc., a biotechnology company, and Amgen Inc., a biotechnology company. Dr. Zsebo received a B.S. in Biochemistry from the University of Maryland, an M.S. in Biochemistry and Biophysics from Oregon State University and a Ph.D. in Comparative Biochemistry from the University of California, Berkeley. Our board of directors believes that Dr. Zsebo's 29 years of experience in the pharmaceutical industry, experience with drug development and service as our President and Chief Executive Officer qualify her to serve on our board of directors.

Rebecque J. Laba. Ms. Laba has served as our Vice President, Finance and Administration since September 2007, and before that, served as a consultant to us on finance and administrative matters since October 2005. From 1999 to 2005, Ms. Laba served in various financial and operational roles at Idun Pharmaceuticals, Inc. until Idun was acquired by Pfizer Inc., a pharmaceutical company, in 2005. From 1997 to 1999, Ms. Laba worked at Asset Management Group, where she served in various financial and operational roles.

Jeffrey J. Rudy. Mr. Rudy has served as our Vice President, Clinical Operations since joining us in 2006. From 1997 to 2006, Mr. Rudy worked at Agouron Pharmaceuticals (prior to its acquisition by the Warner-

Lambert Company, which was subsequently acquired by Pfizer) where he served in roles of increasing responsibility within its clinical research operations, including portfolio manager of the ophthalmology franchise and director of development operations. From 1995 to 1997, Mr. Rudy was at Gilead Sciences, Inc., a biopharmaceutical company, where he was clinical program manager in the clinical research department overseeing a number of antiviral compounds in early development. From 1991 to 1994, Mr. Rudy was at Amgen, where he worked in clinical affairs on a number of antiviral programs. Mr. Rudy received his B.S. in Microbiology from Ohio State University.

Ryan K. Takeya. Mr. Takeya has served as our Vice President, Manufacturing since April 2012. From August 1996 to December 2009, Mr. Takeya served in the Manufacturing Group at Targeted Genetics Corporation, a biotechnology company, where he oversaw in-house and contract manufacturing of clinical gene therapy products, including clinical supplies used in the MYDICAR clinical program. From 1993 to 1996, Mr. Takeya held various process development and process transfer roles at Immunex Corporation, a biotechnology company. In 2011, Mr. Takeya was at Dendreon Corporation, a biotechnology company, where he was involved with the transfer of the PROVENGE antigen manufacturing process to a secondary commercial manufacturing site. Mr. Takeya received his B.A. in Chemistry from the University of Washington.

Fredrik Wiklund. Mr. Wiklund has served as our Vice President, Corporate Development and Investor Relations since August 2013 and as our Vice President, Corporate Development from June 2013 to August 2013. Before that, he served as our Senior Director, Corporate Development from April 2012 to June 2013. From September 2009 to April 2012, Mr. Wiklund served as a consultant to us on business development matters. From November 2003 to November 2008, Mr. Wiklund was head of corporate development and investor relations at Tercica, Inc., a biopharmaceutical company, until its acquisition by the Ipsen Group, a biotechnology company, in 2008. From January 2001 to June 2003, Mr. Wiklund was at Lehman Brothers, Inc., a global financial services firm, where he served in the Investment Banking Health Care Group. From 1996 to 2000, Mr. Wiklund served as an antiviral specialist at Gilead Sciences. Mr. Wiklund received his M.B.A. from the University of Southern California and his B.A. in International Relations from the University of San Diego.

Non-Employee Directors

Barbara J. Dalton, Ph.D. Dr. Dalton has served on our board of directors and as Chairman of the Board of Directors since January 2012. Since July 2007, Dr. Dalton has served as vice president of Venture Capital at Pfizer, where she is responsible for Pfizer Venture Investments, the pharmaceutical investment arm of Pfizer focusing on private equity investments. From January 2000 to June 2007, Dr. Dalton was a general partner of EuclidSR Partners, a private venture capital firm, where she was a founding member. Dr. Dalton began her career in 1983 as a research scientist at SmithKline, a pharmaceutical company, before moving to their venture capital subsidiary, SR One, Limited from 1993 to 2003. Dr. Dalton leads the Healthcare Investing Group of the New York City Investment Fund and is a former member of the board of directors of the Alzheimer's Disease Research Foundation and the National Venture Capital Association. Dr. Dalton is an advisor to the Dean of the Eberly College of Science at Penn State University, where she received her undergraduate degree, and a member of The Penn State Research Foundation Board of Directors. Dr. Dalton received her Ph.D. in Immunology and Microbiology from The Medical College of Pennsylvania (now part of the Drexel University College of Medicine). Our board of directors believes that Dr. Dalton's expertise and experience in the biotechnology industry qualifies her to serve on our board of directors.

Gregg Alton. Mr. Alton has served on our board of directors since August 2013. Since August 2009, Mr. Alton has served as executive vice president of corporate and medical affairs and chief compliance officer at Gilead Sciences. In this role, Mr. Alton oversees legal affairs, public affairs, government affairs, emerging markets and medical affairs. From January 2008 to March 2013, Mr. Alton served as a director of Oculus Innovative Sciences, Inc., a global healthcare company. From March 2000 to August 2009, Mr. Alton served as general counsel at Gilead and from October 1999 to March 2000, served as associate general counsel at the same company. Mr. Alton was a corporate attorney at the law firm of Cooley Godward LLP (now Cooley LLP) from

November 1993 to December 1996 and from July 1998 to October 1999, and at the law firm Mintz Levin Cohn Ferris Glovsky and Popeo, P.C. from January 1997 to July 1998. Mr. Alton received a B.A. from the University of California, Berkeley and a J.D. from Stanford Law School. Our board of directors believes that Mr. Alton's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors.

Fouad Azzam, Ph.D. Dr. Azzam has served on our board of directors since April 2012. Since February 2007, Dr. Azzam has been a general partner at Life Sciences Partners, a venture capital group, where he has been responsible for operations in the United States and for investments in North America. From 2004 to 2007, Dr. Azzam was managing director of Eastman Ventures, the venture capital arm of Eastman Chemical Co. From 1997 to 2007, Dr. Azzam held various leadership positions at Eastman Chemical Co., including in corporate strategy, corporate development, new business development and ventures. Previously in his career, Dr. Azzam held business, operating and technology roles at Occidental Chemical Corporation, a subsidiary of Occidental Petroleum Corporation and Goodrich Corporation (formerly B.F. Goodrich Corporation). Dr. Azzam currently serves on the board of directors of Cobalt Technologies, Inc., a next generation biofuels company, IlluminOss Medical, Inc., a medical device company, Seahorse Bioscience, Inc. and Harvest Automation, Inc., a material handling company. Dr. Azzam holds a Ph.D. in Chemical Engineering from the University of Akron and an M.B.A. in Strategy and Finance from the University of Buffalo School of Management. Our board of directors believes that Dr. Azzam's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors. Dr. Azzam will resign from our board of directors contingent and effective upon the closing of this offering.

Graham Cooper. Mr. Cooper has served on our board of directors since August 2013. Since February 2013, Mr. Cooper has served as chief financial officer at Receptos Corporation, a biopharmaceutical company focused on therapeutics for immune disorders. From January 2012 to December 2012, Mr. Cooper served as executive vice president of finance and chief financial officer at Geron Corporation, a biopharmaceutical company focused on cancer therapies. From May 2006 to March 2011, Mr. Cooper served as senior vice president, chief financial officer and treasurer of Orexigen Therapeutics, Inc., a biotechnology company focused on obesity. From 1999 to 2006, Mr. Cooper held positions of increasing responsibility, including director, health care investment banking, at Deutsche Bank Securities, a leading global investment bank, where he was responsible for executing and managing a wide variety of financing and merger and acquisition transactions in the life sciences field. From August 1992 to January 1995, Mr. Cooper worked as an accountant at Deloitte & Touche LLP, an independent registered public accounting firm, and was previously a C.P.A. Mr. Cooper holds a B.A. in economics from the University of California, Berkeley and an M.B.A. from the Stanford Graduate School of Business. Our board of directors believes that Mr. Cooper's expertise and experience in the biotechnology industry and his financial expertise qualifies him to serve on our board of directors.

Todd Foley. Mr. Foley has served on our board of directors since March 2012. Since 1999, Mr. Foley has held various positions at MPM Capital, an investment firm which targets biotechnology, specialty pharmaceutical and medical technology companies, and currently serves as a managing director. Prior to joining MPM Capital, Mr. Foley worked in business development at Genentech Inc., a drug development company, and in management consulting with Arthur D. Little, Inc., an international management consulting firm. From December 2009 to April 2013, Mr. Foley served on the board of directors of Zalicus, Inc., a biopharmaceutical company. Mr. Foley presently serves on the board of directors of Aires Pharmaceuticals, Inc., Chiasma, Inc., a biopharmaceutical company, Selexys Pharmaceuticals Corporation and Proteon Therapeutics, Inc., a biopharmaceutical company. Mr. Foley holds a B.S. in chemistry from the Massachusetts Institute of Technology and an M.B.A. from Harvard Business School. Our board of directors believes that Mr. Foley's experience in the biotechnology industry as well as his management consulting experience qualifies him to serve on our board of directors.

Joshua Funder, Ph.D. Dr. Funder has served on our board of directors since January 2012. Dr. Funder has been a partner with GBS Venture Partners, a venture capital group since April 2004. From January 2003 to March 2004, Dr. Funder was senior manager, corporate strategy and development at Infinity Pharmaceuticals,

Inc., a drug discovery company. From June 2004 to December 2004, Dr. Funder served as interim chief executive officer of Proacta Inc., a biopharmaceutical company. Dr. Funder also serves as a member of the board of directors of OPAL Inc., Spinifex Pty Ltd and Pathway Therapeutics Ltd. Dr. Funder received a B.S. and a Bachelor of Laws from Melbourne University, and a Master of Laws from the London School of Economics. He also holds a D.Phil. in intellectual property for biotechnology from Oxford University. Our board of directors believes that Dr. Funder's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors.

Johan Kördel, Ph.D. Dr. Kördel has served on our board of directors since January 2012. Since April 2010, Dr. Kördel has served as a senior partner at Lundbeckfond Ventures, an evergreen life science venture fund. From May 2008 to February 2010, Dr. Kördel served as chief executive officer of Sound Biotech ApS, a biotechnology development company which Dr. Kördel co-founded. From October 2000 to August 2003, Dr. Kördel served as senior vice president of research of Biovitrum AB, a pharmaceutical company Dr. Kördel co-founded. From September 2003 to January 2006, he was the senior vice president of business development for the same company. Previously, Dr. Kördel held a number of positions in research and development including that of deputy head of metabolic diseases and endocrinology discovery research at Pharmacia before its acquisition by Pfizer in April 2003. Dr. Kördel has been an associate professor of physical chemistry at Lund University, Sweden since 1994. Earlier in his career, Dr. Kördel worked at Scripps Research Institute in La Jolla, California, and Harvard Medical School in Boston, Massachusetts. Dr. Kördel presently serves on the board of directors of Acacia Pharma Ltd., Enterome S. A., EQL Pharma AB and River Vision Ltd. and is an observer on the board of BoneSupport AB. Dr. Kördel holds a Ph.D. in physical chemistry and an M.Sc. from Lund University, Sweden. Our board of directors believes that Dr. Kördel's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors.

Daniel R. Omstead, Ph.D. Dr. Omstead has served on our board of directors since January 2012. Since June 2001, Dr. Omstead has served as the president and chief executive officer of Tekla Capital Management, LLC (formerly known as Hambrecht & Quist Capital Management, LLC), a registered investment adviser. Since 2001, Dr. Omstead has also served as president of H&Q Life Sciences Investors and H&Q Healthcare Investors, two NYSE listed closed-end mutual funds that make venture and public equity investments principally in small, emerging healthcare-related companies. From June 1997 until August 2000, Dr. Omstead served as president and chief executive officer of Reprogenesis, Inc., a private development stage biotech company developing therapies in the field of regenerative medicine. In 2000, Reprogenesis was merged with two other biotech companies to form Curis, Inc. Before joining Reprogenesis, Dr. Omstead was senior vice president, research and development at Cytotherapeutics, Inc., a biotechnology company that developed central nervous system disorder therapies. Before entering the biotechnology industry, Dr. Omstead was employed for 14 years in the pharmaceutical industry at Ortho Pharmaceutical Corporation and at the R.W. Johnson Pharmaceutical Research Institute, both divisions of Johnson & Johnson and at Merck Sharpe & Dohme Research Laboratories, a division of Merck & Company, Inc. Dr. Omstead holds a Ph.D. and an M.S. in Chemical Engineering and Applied Chemistry from Columbia University and a B.S. in Civil Engineering from Lehigh University. Our board of directors believes that Dr. Omstead's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors. Dr. Omstead will resign from our board of directors contingent and effective upon the closing of this offering.

Andrew E. Senyei, M.D. Dr. Senyei has served on our board of directors since September 2004. Since 1988, Dr. Senyei has served as a managing director and a general partner of Enterprise Partners Venture Capital, a venture capital firm. In 1989, Dr. Senyei co-founded Molecular Biosystems, Inc., a biotechnology company acquired by Alliance Pharmaceutical Corp. in 2000. Prior to joining Enterprise Partners, Dr. Senyei served as a practicing clinician and adjunct associate professor of Obstetrics and Gynecology at the University of California, Irvine. Since April 2000, Dr. Senyei has served as Chairman of Genoptix, Inc., a specialized medical laboratory service provider. From 1987 to 2007, Dr. Senyei served as a director of Adeza Biomedical Corporation, a healthcare products company, until Adeza was acquired by Cytyc Corporation. Dr. Senyei has served on the Board of Trustees of Northwestern University since 2005 and on the Advisory Council of the Jacobs School of

Engineering at the University of California, San Diego, since 2002. Dr. Senyei received a B.S. from Occidental College and an M.D. from Northwestern University Medical School, and he completed his residency training at the University of California, Irvine, Medical Center. Our board of directors believes that Dr. Senyei's expertise and experience in the biotechnology industry qualifies him to serve on our board of directors. Dr. Senyei will resign from our board of directors contingent and effective upon the closing of this offering.

Lauren Silverman, Ph.D. Dr. Silverman has served on our board of directors since January 2012. Since November 2006, Dr. Silverman has served as a managing director of the Novartis Venture Fund (formerly the Novartis Option Fund), the investment arm of Novartis AG, which focuses on investing in innovative life science concepts for patient benefit. From April 2005 to November 2006, Dr. Silverman was global head of oncology research operations for Novartis. From September 2001 to March 2005, Dr. Silverman was the director of business development and licensing at Pfizer. From August 1999 to September 2001, Dr. Silverman was the director of business development and licensing at OSI Pharmaceuticals, Inc. From November 1992 to August 1999, Dr. Silverman was the director of strategic alliances and head of cell biology of Cadus Pharmaceuticals, where she was a founding scientist. Dr. Silverman currently serves on the board of directors of Proteostasis Therapeutics Inc., Pulmatrix Inc., Ra Pharmaceuticals, Inc. and Viamet Pharmaceuticals, Inc. She serves on the Business Advisory Board of the Epilepsy Research Foundation's Epilepsy Therapy Project, the National Cancer Institute's SBIR review panel, the Massachusetts Life Sciences Center's Scientific Advisory Board and the Board of Directors of the Science Club for Girls. Dr. Silverman was a postdoctoral fellow at the Memorial Sloan-Kettering Cancer Center and Princeton University and earned her Ph.D. in molecular biology from the University of Utah. Our board of directors believes that Dr. Silverman's expertise and experience in the biotechnology industry qualifies her to serve on our board of directors.

Board Composition

Our business and affairs are organized under the direction of our board of directors, which currently consists of eleven members. The primary responsibilities of our board of directors are to provide oversight, strategic guidance, counseling and direction to our management. Our board of directors meets on a regular basis and additionally as required.

Each of our current directors was elected to serve as a member of our board of directors pursuant to a voting agreement, dated January 27, 2012, as amended, by and among us and certain of our stockholders. Pursuant to the voting agreement, Dr. Dalton, Dr. Azzam, Mr. Foley, Dr. Funder, Dr. Kördel, Dr. Omstead, Dr. Senyei and Dr. Silverman were selected to serve on our board of directors as the representative of our preferred stockholders, as designated by Pfizer, Coöperatief LSP IV UA, MPM Capital, GBS Venture Partners, Lundbeckfond Ventures, H&Q Healthcare Investors, Enterprise Partners and Novartis, respectively. Dr. Zsebo was selected to serve on our board of directors as the representative of our common stockholders. Mr. Alton and Mr. Cooper were selected to serve on our board of directors as independent directors with relevant experience in our industry. The voting agreement will terminate upon the closing of this offering, and members previously elected to our board of directors pursuant to the voting agreement (other than Dr. Azzam, Dr. Omstead and Dr. Senyei, who will resign from our board of directors contingent and effective upon the closing of this offering) will continue to serve as directors until their successors are duly elected and qualified by holders of our common stock.

Our board of directors has determined that all of our directors, except Dr. Zsebo, are independent directors, as defined by Rule 5605(a)(2) of the NASDAQ Listing Rules.

In accordance with the terms of our amended and restated certificate of incorporation and bylaws, which will be effective immediately prior to consummation of this offering, our board of directors will be divided into three classes, class I, class II and class III, with members of each class serving staggered three-year terms.

Effective upon the closing of this offering, our board of directors will be comprised of the following classes:

- Class I, which will consist of Dr. Dalton, Mr. Foley and Dr. Silverman, whose terms will expire at our annual meeting of stockholders to be held in 2014;

- Class II, which will consist of Dr. Funder and Dr. Kördel, whose terms will expire at our annual meeting of stockholders to be held in 2015; and
- Class III, which will consist of Mr. Alton, Mr. Cooper and Dr. Zsebo, whose terms will expire at our annual meeting of stockholders to be held in 2016.

At each annual meeting of stockholders to be held after the initial classification, the successors to directors whose terms then expire will serve until the third annual meeting following their election and until their successors are duly elected and qualified. The authorized size of our board of directors is currently eleven members. The authorized number of directors may be changed only by resolution by a majority of the board of directors. This classification of the board of directors may have the effect of delaying or preventing changes in our control or management. Our directors may be removed for cause by the affirmative vote of the holders of at least 66 ⅔% of our voting stock.

Board Leadership Structure

Our board of directors is currently chaired by Dr. Dalton. As a general policy, our board of directors believes that separation of the positions of Chairman and Chief Executive Officer reinforces the independence of the board of directors from management, creates an environment that encourages objective oversight of management's performance and enhances the effectiveness of the board of directors as a whole. As such, Dr. Zsebo serves as our President and Chief Executive Officer while Dr. Dalton serves as our Chairman of the Board of Directors but is not an officer. We expect and intend the positions of Chairman of the Board of Directors and Chief Executive Officer to continue to be held by two individuals in the future.

Role of the Board in Risk Oversight

One of the key functions of our board of directors is informed oversight of our risk management process. The board of directors does not have a standing risk management committee, but rather administers this oversight function directly through the board of directors as a whole, as well as through various standing committees of our board of directors that address risks inherent in their respective areas of oversight. In particular, our board of directors is responsible for monitoring and assessing strategic risk exposure and our audit committee has the responsibility to consider and discuss our major financial risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken. The audit committee also monitors compliance with legal and regulatory requirements. Our nominating and corporate governance committee monitors the effectiveness of our corporate governance practices, including whether they are successful in preventing illegal or improper liability-creating conduct. Our compensation committee assesses and monitors whether any of our compensation policies and programs has the potential to encourage excessive risk-taking.

Board Committees

Our board of directors has established an audit committee, a compensation committee and a nominating and corporate governance committee.

Audit Committee

Our audit committee consists of Mr. Cooper, Mr. Foley and Dr. Funder. Our board of directors has determined that each of the members of our audit committee satisfies the NASDAQ Stock Market and SEC independence requirements.

Mr. Cooper serves as the chair of our audit committee. Our board of directors has determined that Mr. Cooper qualifies as an audit committee financial expert within the meaning of SEC regulations and meets the financial sophistication requirements of the NASDAQ Listing Rules. In making this determination, our board has considered

Mr. Cooper's formal education and previous and current experience in financial roles. Both our independent registered public accounting firm and management periodically meet privately with our audit committee.

The functions of this committee include, among other things:

- evaluating the performance, independence and qualifications of our independent auditors and determining whether to retain our existing independent auditors or engage new independent auditors;
- reviewing and approving the engagement of our independent auditors to perform audit services and any permissible non-audit services;
- monitoring the rotation of partners of our independent auditors on our engagement team as required by law;
- prior to engagement of any independent auditor, and at least annually thereafter, reviewing relationships that may reasonably be thought to bear on their independence, and assessing and otherwise taking the appropriate action to oversee the independence of our independent auditor;
- reviewing our annual and quarterly financial statements and reports, including the disclosures contained under the caption "Management's Discussion and Analysis of Financial Condition and Results of Operations," and discussing the statements and reports with our independent auditors and management;
- reviewing with our independent auditors and management significant issues that arise regarding accounting principles and financial statement presentation and matters concerning the scope, adequacy and effectiveness of our financial controls;
- reviewing with management and our auditors any earnings announcements and other public announcements regarding material developments;
- establishing procedures for the receipt, retention and treatment of complaints received by us regarding financial controls, accounting or auditing matters and other matters;
- preparing the report that the SEC requires in our annual proxy statement;
- reviewing and providing oversight of any related-person transactions in accordance with our related-person transaction policy and reviewing and monitoring compliance with legal and regulatory responsibilities, including our code of business conduct and ethics;
- reviewing our major financial risk exposures, including the guidelines and policies to govern the process by which risk assessment and risk management is implemented;
- reviewing on a periodic basis our investment policy; and
- reviewing and evaluating on an annual basis the performance of the audit committee, including compliance of the audit committee with its charter.

We believe that the composition and functioning of our audit committee complies with all applicable requirements of the Sarbanes-Oxley Act, and all applicable SEC and NASDAQ rules and regulations. We intend to comply with future requirements to the extent they become applicable to us.

Compensation Committee

Our compensation committee consists of Mr. Alton, Dr. Dalton and Dr. Kördel. Dr. Dalton serves as the chair of our compensation committee. Our board of directors has determined that each of the members of our compensation committee is a non-employee director, as defined in Rule 16b-3 promulgated under the Securities Exchange Act of 1934, as amended, or the Exchange Act, is an outside director, as defined pursuant to Section 162(m) of the Code, and satisfies the NASDAQ Stock Market independence requirements. The functions of this committee include, among other things:

- reviewing, modifying and approving (or if it deems appropriate, making recommendations to the full board of directors regarding) our overall compensation strategy and policies;

- making recommendations to the full board of directors regarding the compensation and other terms of employment of our executive officers;
- reviewing and making recommendations to the full board of directors regarding performance goals and objectives relevant to the compensation of our executive officers and assessing their performance against these goals and objectives;
- reviewing and approving (or if it deems it appropriate, making recommendations to the full board of directors regarding) the equity incentive plans, compensation plans and similar programs advisable for us, as well as modifying, amending or terminating existing plans and programs;
- evaluating risks associated with our compensation policies and practices and assessing whether risks arising from our compensation policies and practices for our employees are reasonably likely to have a material adverse effect on us;
- reviewing and making recommendations to the full board of directors regarding the type and amount of compensation to be paid or awarded to our non-employee board members;
- establishing policies with respect to votes by our stockholders to approve executive compensation to the extent required by Section 14A of the Exchange Act and, if applicable, determining our recommendations regarding the frequency of advisory votes on executive compensation;
- reviewing and assessing the independence of compensation consultants, legal counsel and other advisors as required by Section 10C of the Exchange Act;
- administering our equity incentive plans;
- establishing policies with respect to equity compensation arrangements;
- reviewing the competitiveness of our executive compensation programs and evaluating the effectiveness of our compensation policy and strategy in achieving expected benefits to us;
- reviewing and making recommendations to the full board of directors regarding the terms of any employment agreements, severance arrangements, change of control protections and any other compensatory arrangements for our executive officers;
- reviewing the adequacy of its charter on a periodic basis;
- reviewing with management and approving our disclosures under the caption “Compensation Discussion and Analysis” in our periodic reports or proxy statements to be filed with the SEC, to the extent such caption is included in any such report or proxy statement;
- preparing the report that the SEC requires in our annual proxy statement; and
- reviewing and assessing on an annual basis the performance of the compensation committee.

We believe that the composition and functioning of our compensation committee complies with all applicable requirements of the Sarbanes-Oxley Act of 2002, and all applicable SEC and NASDAQ rules and regulations. We intend to comply with future requirements to the extent they become applicable to us.

Nominating and Corporate Governance Committee

Our nominating and corporate governance committee consists of Mr. Alton, Mr. Cooper and Dr. Silverman. Our board of directors has determined that each of the members of this committee satisfies the NASDAQ Stock Market independence requirements. Mr. Alton serves as the chair of our nominating and corporate governance committee. The functions of this committee include, among other things:

- identifying, reviewing and evaluating candidates to serve on our board of directors consistent with criteria approved by our board of directors;
- determining the minimum qualifications for service on our board of directors;

- evaluating director performance on the board and applicable committees of the board and determining whether continued service on our board is appropriate;
- evaluating, nominating and recommending individuals for membership on our board of directors;
- evaluating nominations by stockholders of candidates for election to our board of directors;
- considering and assessing the independence of members of our board of directors;
- developing a set of corporate governance policies and principles, including a code of business conduct and ethics, periodically reviewing and assessing these policies and principles and their application and recommending to our board of directors any changes to such policies and principles;
- considering questions of possible conflicts of interest of directors as such questions arise;
- reviewing the adequacy of its charter on an annual basis; and
- annually evaluating the performance of the nominating and corporate governance committee.

We believe that the composition and functioning of our nominating and corporate governance committee complies with all applicable requirements of the Sarbanes-Oxley Act of 2002, and all applicable SEC and NASDAQ rules and regulations. We intend to comply with future requirements to the extent they become applicable to us.

Compensation Committee Interlocks and Insider Participation

We have established a compensation committee which has and will make decisions relating to compensation of our executive officers. Our board of directors has appointed Dr. Dalton, Dr. Kördel and Dr. Silverman to serve on the compensation committee. None of these individuals has ever been an executive officer or employee of ours. None of our executive officers currently serves, or has served during the last completed fiscal year, on the compensation committee or board of directors of any other entity that has one or more executive officers serving as a member of our board of directors or compensation committee.

Limitation on Liability and Indemnification of Directors and Officers

Our amended and restated certificate of incorporation and bylaws, which will be effective immediately prior to consummation of this offering, limit our directors' and officers' liability to the fullest extent permitted under Delaware corporate law. Delaware corporate law provides that directors of a corporation will not be personally liable for monetary damages for breach of their fiduciary duties as directors, except for liability:

- for any transaction from which the director derives an improper personal benefit;
- for any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- under Section 174 of the Delaware General Corporation Law (unlawful payment of dividends or redemption of shares); or
- for any breach of a director's duty of loyalty to the corporation or its stockholders.

If the Delaware General Corporation Law is amended to authorize corporate action further eliminating or limiting the personal liability of directors or officers, then the liability of our directors or officers shall be eliminated or limited to the fullest extent permitted by the Delaware General Corporation Law, as so amended.

Delaware law and our amended and restated bylaws provide that we will, in certain situations, indemnify any person made or threatened to be made a party to a proceeding by reason of that person's former or present official capacity with us against judgments, penalties, fines, settlements and reasonable expenses. Any person is also entitled, subject to certain limitations, to payment or reimbursement of reasonable expenses (including attorneys' fees and disbursements) in advance of the final disposition of the proceeding.

In addition, we have entered, and intend to continue to enter, into separate indemnification agreements with our directors and executive officers. These agreements, among other things, require us to indemnify our directors and executive officers for certain expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or executive officer in any action or proceeding arising out of their services as one of our directors or executive officers or as a director or executive officer of any other company or enterprise to which the person provides services at our request.

We believe that these provisions in our amended and restated certificate of incorporation and amended bylaws and these indemnification agreements are necessary to attract and retain qualified persons as directors and officers. We also maintain a directors' and officers' insurance policy pursuant to which our directors and officers are insured against liability for actions taken in their capacities as directors and officers.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or control persons, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

EXECUTIVE AND DIRECTOR COMPENSATION

Our named executive officers for the year ended December 31, 2012, which consist of our principal executive officer and our two other most highly compensated executive officers, are:

- Krisztina M. Zsebo, Ph.D., our President and Chief Executive Officer;
- Rebecque J. Laba, our Vice President, Finance and Administration; and
- Jeffrey J. Rudy, our Vice President, Clinical Operations.

Summary Compensation Table

Name and principal position	Year	Salary ($)	Option awards ($)(1)	Non-equity incentive plan compensation ($)(2)	All other compensation ($)	Total ($)
Krisztina M. Zsebo, Ph.D. *President and Chief Executive Officer*	2012	399,627	370,045	89,180	19,412(3)	878,264
Rebecque J. Laba *Vice President, Finance and Administration*	2012	206,668	86,961	42,000	17,929(4)	353,558
Jeffrey J. Rudy *Vice President, Clinical Operations*	2012	207,692	86,961	52,500	17,744(5)	364,897

(1) In accordance with SEC rules, this column reflects the aggregate grant date fair value of the option awards granted during 2012 computed in accordance with Financial Accounting Standard Board Accounting Standards Codification Topic 718 for stock-based compensation transactions (ASC 718). Assumptions used in the calculation of these amounts are included in Note 6 to our audited financial statements included elsewhere in this prospectus. These amounts do not reflect the actual economic value that will be realized by the named executive officer upon the vesting of the stock options, the exercise of the stock options, or the sale of the common stock underlying such stock options.

(2) Amounts shown represent annual performance-based bonuses earned for 2012. For more information, see below under "—Annual Performance-Based Bonus Opportunity."

(3) Amount shown represents $17,162 in 401(k) matching contributions, $1,050 premiums for life, disability and accidental death and dismemberment insurance, and a $1,200 personal life insurance subsidy paid by us on behalf of or directly to, as applicable, Dr. Zsebo. These benefits are provided to the named executive officers on the same terms as provided to all of our regular full-time employees in the United States. For more information regarding these benefits, see below under "—Perquisites, Health, Welfare and Retirement Benefits."

(4) Amount shown represents $15,679 in 401(k) matching contributions, $1,050 premiums for life, disability and accidental death and dismemberment insurance, and a $1,200 personal life insurance subsidy paid by us on behalf of or directly to, as applicable, Ms. Laba. These benefits are provided to the named executive officers on the same terms as provided to all of our regular full-time employees in the United States. For more information regarding these benefits, see below under "—Perquisites, Health, Welfare and Retirement Benefits."

(5) Amount shown represents $15,494 in 401(k) matching contributions, $1,050 premiums for life, disability and accidental death and dismemberment insurance, and a $1,200 personal life insurance subsidy paid by us on behalf of or directly to, as applicable, Mr. Rudy. These benefits are provided to the named executive officers on the same terms as provided to all of our regular full-time employees in the United States. For more information regarding these benefits, see below under "—Perquisites, Health, Welfare and Retirement Benefits."

Annual Base Salary

The compensation of our named executive officers is generally determined and approved by our board of directors, based on the recommendation of the compensation committee of our board of directors. Our board of directors approved the following 2012 base salaries for our named executive officers, which became effective on April 1, 2012.

Name	2012 Base Salary ($)
Krisztina M. Zsebo, Ph.D.	405,363
Rebecque J. Laba	210,000
Jeffrey J. Rudy	210,000

Annual Performance-Based Bonus Opportunity

In addition to base salaries, our named executive officers are eligible to receive annual performance-based cash bonuses, which are designed to provide appropriate incentives to our executives to achieve defined annual corporate goals and to reward our executives for individual achievement towards these goals. The annual performance-based bonus each named executive officer is eligible to receive is generally based on the extent to which we achieve the corporate goals that our board of directors establishes each year. At the end of the year, our board of directors reviews our performance against each corporate goal and approves the extent to which we achieved each of our corporate goals.

Our board of directors will generally consider each named executive officer's individual contributions towards reaching our annual corporate goals but does not typically establish specific individual goals for our named executive officers. There is no minimum bonus percentage or amount established for the named executive officers and, as a result, the bonus amounts vary from year to year based on corporate and individual performance. For 2012, Dr. Zsebo and Mr. Rudy were eligible to receive a target bonus of up to 25% of their base salaries pursuant to the terms of their employment letter agreements described below under "—Agreements with our Named Executive Officers". For 2012, our board of directors established a general target bonus of 20% for our other executive officers, including Ms. Laba.

The corporate goals established by our board of directors for 2012 were to (1) obtain an SPA with the FDA, including agreement for using time-to-multiple heart failure-related hospitalizations as the primary endpoint for MYDICAR approval; (2) dose the first U.S. patient in our CUPID 2 trial by August 2012; (3) enroll at least 30 U.S. and EU patients in our CUPID 2 trial by December 2012; (4) dose the first EU patient in our CUPID 2 trial by October 2012; (5) finalize and submit to regulatory authorities the protocol for an additional Phase 2 trial with MYDICAR by December 2012. Each of the corporate goals was weighted 20% towards overall corporate goal achievement and there was no minimum percentage of corporate goals that must be achieved in order to earn a bonus. No specific individual goals were established for any of our named executive officers for 2012. Rather, the board of directors considered each named executive officer's efforts towards and influence over our corporate goals in determining the amount of each named executive officer's bonus.

In early 2013, our board of directors reviewed our corporate goals and determined that overall we had substantially achieved our goals. Specifically, our board of directors determined that we had fully achieved our goals of obtaining the SPA on time, by receiving the FDA's acceptance letter in May 2012, we had completed our goal relating to dosing the first U.S. patient in our CUPID 2 trial in August 2012 and we had finalized and submitted the protocol for an additional Phase 2 trial with MYDICAR in October 2012. Our board of directors determined that we partially achieved our enrollment goal by enrolling a substantial number of U.S. and EU patients by December 2012 and that we achieved our goal of dosing the first EU patient in our CUPID 2 trial, although achievement occurred later than anticipated in 2012. Accordingly, our board of directors awarded Dr. Zsebo a bonus slightly lower than her target bonus opportunity because she was primarily responsible for our corporate goal achievement, and awarded each of Ms. Laba and Mr. Rudy their target bonus amounts, in

recognition of each of their efforts towards our successful achievement of our corporate goals and taking into consideration the fact that our original enrollment target was set early in 2012 prior to full review and the substantial interest we received in both MYDICAR and our small molecule product candidates.

Equity-Based Incentive Awards

Our equity-based incentive awards are designed to align our interests with those of our employees and consultants, including our named executive officers. Our board of directors is responsible for approving equity grants. As of December 31, 2012, stock option awards were the only form of equity awards we granted to our named executive officers. Vesting of the stock option awards is tied to continuous service with us and serves as an additional retention measure. Our executives generally are awarded an initial grant upon commencement of employment. Additional grants may occur periodically in order to specifically incentivize executives with respect to achieving certain corporate goals or to reward executives for exceptional performance.

Prior to this offering, we have granted all equity awards pursuant to the 2012 plan and the 2001 plan, the terms of which are described below under "—Equity Benefit Plans." All options are granted with a per share exercise price equal to no less than the fair market value of a share of our common stock on the date of the grant of such award.

Generally our stock option awards vest over a four-year period subject to the holder's continuous service to us and may be granted with an early exercise feature. Such early exercise feature allows the holder to exercise and receive unvested shares of our stock, so that the holder may have a greater opportunity for gains on the shares to be taxed at long-term capital gains rates rather than ordinary income rates.

Effective June 15, 2012, our board of directors granted to each of Dr. Zsebo, Ms. Laba and Mr. Rudy options to purchase 5,758,927, 1,353,348 and 1,353,348 shares of common stock, respectively, with an exercise price of $0.09 per share. The vesting terms of the 2012 option grants are described in the footnotes to the "—Outstanding Equity Awards at Fiscal Year-End" table below.

Agreements with our Named Executive Officers

Below are descriptions of our employment letter agreements with our named executive officers.

Agreement with Dr. Zsebo. We entered into a letter agreement with Dr. Zsebo in July 2012 that governs the current terms of her employment with us. Pursuant to the agreement, Dr. Zsebo is entitled to an annual base salary of $405,363, is eligible to receive an annual target performance bonus of up to 25% of her base salary, as determined by our board of directors and was granted an option to purchase 5,758,927 shares of our common stock. Dr. Zsebo is additionally entitled to certain severance benefits pursuant to her agreement, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

In August 2013, we entered into an amended and restated letter agreement with Dr. Zsebo that will replace her letter agreement described above and become effective in connection with the execution and delivery of the underwriting agreement related to this offering. Under the amended and restated letter agreement, Dr. Zsebo is entitled to an annual base salary of $417,524, is eligible to receive an annual target performance bonus of 45% of her base salary, and certain severance benefits, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

Agreement with Ms. Laba. We entered into a letter agreement with Ms. Laba in September 2007, as amended in April 2012, that governs the terms of her employment with us. Pursuant to the agreement, Ms. Laba is entitled to an annual base salary of $180,000 and was granted an option to purchase 2,000 shares (giving effect to the 1-for-100 reverse split of our common stock that occurred in January 2012) of our common stock. Ms. Laba is additionally entitled to certain severance benefits pursuant to her agreement, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

In September 2013, we entered into an amended and restated letter agreement with Ms. Laba that will replace her letter agreement described above and become effective in connection with the execution and delivery of the underwriting agreement related to this offering. Under the amended and restated letter agreement, Ms. Laba is entitled to an annual base salary of $250,000, is eligible to receive an annual target performance bonus of 30% of her base salary, and certain severance benefits, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

Agreement with Mr. Rudy. We entered into a letter agreement with Mr. Rudy in May 2006 that governs the terms of his employment with us. Pursuant to the agreement, Mr. Rudy is entitled to an annual base salary of $175,000, is eligible to receive an annual target performance bonus of up to 25% of his annual base salary, as determined by our board of directors and was granted an option to purchase 500 shares (giving effect to the 1-for-100 reverse split of our common stock that occurred in January 2012) of our common stock. Mr. Rudy is additionally entitled to certain severance benefits pursuant to his agreement, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

In September 2013, we entered into an amended and restated letter agreement with Mr. Rudy that will replace his letter agreement described above and become effective in connection with the execution and delivery of the underwriting agreement related to this offering. Under the amended and restated letter agreement, Mr. Rudy is entitled to an annual base salary of $250,000, is eligible to receive an annual target performance bonus of 30% of his base salary, and certain severance benefits, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

Potential Payments Upon Termination or Change of Control

Regardless of the manner in which a named executive officer's service terminates, the named executive officer is entitled to receive amounts earned during his or her term of service, including salary and unused vacation pay. In addition, each of our named executive officers is eligible to receive certain benefits pursuant to his or her letter agreements with us described above under "—Agreements with our Named Executive Officers."

Under the terms of the named executive officers' letter agreements that were effective during 2012 and prior to the date of this offering, upon a termination without "cause" or resignation for "good reason," each as defined below, each of Dr. Zsebo and Ms. Laba is eligible to receive payments equal to her monthly base salary rate then in effect for 12 months and three months, respectively. Upon a termination without "cause," as defined below, Mr. Rudy is eligible to receive payments equal to his monthly base salary rate then in effect for 12 weeks. Each of the severance benefits described above is contingent upon the named executive officer's delivery to us of a satisfactory release of claims.

For purposes of Dr. Zsebo's and Ms. Laba's letter agreements, "cause" generally means the occurrence of any of the following events, conditions or actions with respect to the executive: (1) conviction of any felony or crime involving fraud or dishonesty; (2) participation in any material fraud, material act of dishonesty or other material act of misconduct against us; (3) willful and habitual neglect of duties after written notice and opportunity to cure; (4) material violation of any fiduciary duty or duty of loyalty owed to us; (5) breach of any material term of any material contract with us which has a material adverse effect on us; (6) knowing violation of any material company policy which has a material adverse effect on us; or (7) knowing violation of state or federal law in connection with the performance of her job which has a material adverse effect on us. For purposes of Mr. Rudy's letter agreement, "cause" generally means the occurrence of any of the following events, conditions or actions with respect to Mr. Rudy: (1) commission of any act of fraud, embezzlement or dishonesty; (2) unauthorized use or disclosure of our confidential information or trade secrets; (3) intentional misconduct which may have a materially adverse effect upon our business or reputation; or (4) continued failure to perform the major duties, functions and responsibilities of his position after written notice. For purposes of Dr. Zsebo's and Ms. Laba's letter agreements, "good reason" generally means the following events, conditions or actions taken by us with respect to the executive without cause and without the executive's express written consent: (1) a

material reduction in the level of responsibility associated with the executive's then current duties; (2) a material reduction in the executive's then current base salary, benefits and/or target bonus; (3) a relocation of the place at which the executive principally performs her duties to outside the State of California; or (4) with respect to Ms. Laba, any other material breach of Ms. Laba's letter agreement with us.

Under the terms of the named executive officers' amended and restated letter agreements that will become effective in connection with the execution and delivery of the underwriting agreement related to this offering, upon the executive's termination without "cause," or resignation for "good reason," each as defined below, each of Dr. Zsebo, Ms. Laba and Mr. Rudy is eligible to receive continued base salary payments and COBRA premium payments for 12 months for Dr. Zsebo and nine months for Ms. Laba and Mr. Rudy. If the named executive officer's termination without cause or resignation for good reason occurs within the three month period before or 12 month period following a change of control, as defined under our 2013 plan, instead of the benefits described above, the named executive officer will be eligible to receive (1) continued base salary payments and COBRA premium payments for 18 months for Dr. Zsebo and 12 months for Ms. Laba and Mr. Rudy, (2) a lump sum payment equal to the named executive officer's target bonus for the year of termination and (3) full vesting acceleration of all outstanding equity awards that are subject to time-based vesting. All severance benefits under the amended and restated letter agreements are contingent upon the named executive officer executing an effective release and waiver of claims against us.

For purposes of each of the named executive officer's amended and restated letter agreements, "cause" generally has the same meaning as "cause" under Dr. Zsebo's and Ms. Laba's letter agreements described above. For purposes of each of the named executive officer's amended and restated letter agreements, "good reason" generally means the following events, conditions or actions taken by us with respect to the executive without cause and without the executive's express written consent: (1) a material reduction in base salary; (2) a material reduction in the executive's authority, duties or responsibilities; (3) a material reduction in the authority, duties or responsibilities of the supervisor to whom the executive is required to report; or (4) a relocation of the executive's principal place of employment to a place that increases the executive's one-way commute by more than 50 miles.

Each of our named executive officers holds stock options under our equity incentive plans that were granted subject to our form of stock option agreements. A description of the termination and change of control provisions in such equity incentive plans and stock options granted thereunder is provided below under "—Equity Benefit Plans" and the specific vesting terms of each named executive officer's stock options are described below under "—Outstanding Equity Awards at Fiscal Year-End."

Outstanding Equity Awards at Fiscal Year-End

The following table sets forth certain information regarding equity awards granted to our named executive officers that remain outstanding as of December 31, 2012.

		Option Awards(1)			
	Grant Date	Number of securities underlying unexercised options (#) exercisable	Number of securities underlying unexercised options (#) unexercisable	Option exercise price ($)(2)	Option expiration date
Krisztina M. Zsebo, Ph.D.	9/30/2004	2,181	—	10.00	9/30/2014
	12/2/2005	1,950	—	11.00	12/2/2015
	7/25/2006	8,237	—	17.00	7/25/2016
	7/3/2007	2,346	—	18.00	7/3/2017
	11/13/2007	2,839	—	18.00	11/13/2017
	5/6/2008	3,450	—	18.00	5/6/2018
	3/10/2009	1,611(3)	—	18.00	3/10/2019
	1/14/2010	1,611(3)	—	18.00	1/14/2020
	6/10/2010	3,381(4)	—	28.00	6/10/2020
	6/15/2012	5,758,927(5)	—	0.09	6/14/2022
Rebecque J. Laba	7/25/2006	400	—	17.00	7/25/2016
	7/3/2007	500	—	18.00	7/3/2017
	9/12/2007	2,000	—	18.00	9/12/2017
	11/13/2007	700	—	18.00	11/13/2017
	5/6/2008	707	—	18.00	5/6/2018
	3/10/2009	269(3)	—	18.00	3/10/2019
	1/14/2010	269(3)	—	18.00	1/14/2020
	6/10/2010	1,228(4)	—	28.00	6/10/2020
	6/15/2012	1,353,348(5)	—	0.09	6/14/2022
Jeffrey J. Rudy	7/25/2006	500	—	17.00	7/25/2016
	7/3/2007	500	—	18.00	7/3/2017
	11/13/2007	2,511	—	18.00	11/13/2017
	5/6/2008	690	—	18.00	5/6/2018
	3/10/2009	322(3)	—	18.00	3/10/2019
	1/14/2010	322(3)	—	18.00	1/14/2020
	6/10/2010	1,228(4)	—	28.00	6/10/2020
	6/15/2012	1,353,348(5)	—	0.09	6/14/2022

(1) All of the option awards granted in 2012 were granted under the 2012 plan and all of the option awards granted prior to 2012 were granted under the 2001 plan, the terms of which plans are described below under "—Equity Benefit Plans." Except as otherwise indicated, each option award is fully exercisable on the date of grant subject to our right to repurchase any exercised shares prior to the vesting date for such shares and all vesting is subject to the executive's continuous service to us through the vesting dates. The share amounts and exercise prices presented give effect to the 1-for-100 reverse split of our common stock that occurred in January 2012.

(2) All of the option awards were granted with a per share exercise price equal to the fair market value of one share of our common stock on the date of grant, as determined in good faith by our board of directors, often with the assistance of a third-party valuation expert.

(3) 25% of the shares subject to the option vested on the one year anniversary of the March 10, 2009 vesting commencement date and 1/48th of the shares subject to the option vest in equal monthly installments thereafter over the next three years.

(4) 1/48th of the shares vest each month after the April 27, 2010 vesting commencement date. Notwithstanding the foregoing vesting schedule, if we consummate an acquisition or partnering transaction approved by our board of directors with respect to our MYDICAR program, on or before the time the option becomes fully vested and provided that the named executive officer's continuous service with us has not terminated, then all or a portion of the remaining vesting and exercisability of the option may be accelerated to the extent determined by our board of directors in its sole discretion.

(5) 25% of the shares subject to the option vested on the one year anniversary of the January 27, 2012 vesting commencement date and 1/48th of the shares subject to the option vest in equal monthly installments thereafter over the next three years.

Option Exercises and Stock Vested

Our named executive officers did not exercise any stock option awards during the fiscal year ended December 31, 2012.

Option Repricings

We did not engage in any repricings or other modifications or cancellations to any of our named executive officers' outstanding equity awards during the year ended December 31, 2012.

Perquisites, Health, Welfare and Retirement Benefits

All of our named executive officers are eligible to participate in our employee benefit plans, including our medical, dental, vision, life, disability and accidental death and dismemberment insurance plans, in each case on the same basis as all of our other employees. We pay the premiums for the life, disability, accidental death and dismemberment insurance for all of our employees, including our named executive officers. In addition, we provide each of our employees, including our named executive officers, with $100 cash each month to supplement our life insurance plan and we provide our named executive officers the ability to participate, on the same basis as all of our employees, in a heath reimbursement arrangement under Section 105 of the Code. We provide a 401(k) plan to our employees, including our named executive officers, as discussed in the section below entitled "—401(k) Plan."

We do not provide perquisites or personal benefits to our named executive officers. None of our named executive officers participate in or have account balances in qualified or nonqualified defined benefit plans sponsored by us. Our board of directors may elect to adopt qualified or nonqualified benefit plans in the future if it determines that doing so is in our best interests.

401(k) Plan

We maintain a defined contribution employee retirement plan, or 401(k) plan, for our employees. Our named executive officers are also eligible to participate in the 401(k) plan on the same basis as our other employees. The 401(k) plan is intended to qualify as a tax-qualified plan under Section 401(k) of the Code. The plan provides that each participant may contribute up to the lesser of 100% of his or her eligible compensation or the statutory limit, which was $17,000 for calendar year 2012 and is $17,500 for calendar year 2013. Participants that are 50 years or older can also make "catch-up" contributions, which in calendar years 2012 and 2013 may be up to an additional $5,500 above the statutory limit. We provide a match for every dollar our employees elect to defer up to a maximum matching contribution of 7% of each employee's eligible compensation contributions. In general, eligible compensation for purposes of the 401(k) plan includes an employee's earnings reportable on IRS Form W-2 subject to certain adjustments and exclusions required under the Code. The 401(k) plan currently does not offer the ability to invest in our securities.

Nonqualified Deferred Compensation

None of our named executive officers participate in or have account balances in nonqualified defined contribution plans or other nonqualified deferred compensation plans maintained by us. Our board of directors

may elect to provide our officers and other employees with nonqualified defined contribution or other nonqualified deferred compensation benefits in the future if it determines that doing so is in our best interests.

Equity Benefit Plans

2013 Equity Incentive Plan

Our board of directors adopted the 2013 plan in September 2013, and we expect our stockholders will approve the plan prior to the execution and delivery of the underwriting agreement for this offering and that the 2013 plan will become effective upon the execution and delivery of the underwriting agreement related to this offering. Once the 2013 plan is effective, no further grants will be made under the 2012 plan.

Stock Awards. The 2013 plan provides for the grant of incentive stock options, or ISOs, nonstatutory stock options, or NSOs, stock appreciation rights, restricted stock awards, restricted stock unit awards, performance-based stock awards, and other forms of equity compensation, or collectively, stock awards, all of which may be granted to employees, including officers, non-employee directors and consultants of us and our affiliates. Additionally, the 2013 plan provides for the grant of performance cash awards. ISOs may be granted only to employees. All other awards may be granted to employees, including officers, and to non-employee directors and consultants.

Share Reserve. Initially, the aggregate number of shares of our common stock that may be issued pursuant to stock awards under the 2013 plan after the 2013 plan becomes effective is the sum of (1) 8,415,000 shares, plus (2) the number of shares reserved for issuance under our 2012 plan at the time our 2013 plan becomes effective, plus (3) any shares subject to outstanding stock options or other stock awards that were granted under our 2012 plan or 2001 plan that are forfeited, terminate, expire or are otherwise not issued. Additionally, the number of shares of our common stock reserved for issuance under our 2013 plan will automatically increase on January 1 of each year, beginning on January 1, 2014 (assuming the 2013 plan becomes effective before such date) and continuing through and including January 1, 2023, by 4% of the total number of shares of our capital stock outstanding on December 31 of the preceding calendar year, or a lesser number of shares determined by our board of directors. The maximum number of shares of our common stock that may be issued upon the exercise of ISOs under our 2013 plan is 54,156,250 shares.

No person may be granted stock awards covering more than 3,000,000 shares of our common stock under our 2013 plan during any calendar year pursuant to stock options, stock appreciation rights and other stock awards whose value is determined by reference to an increase over an exercise or strike price of at least 100% of the fair market value on the date the stock award is granted. Additionally, no person may be granted in a calendar year a performance stock award covering more than 3,000,000 shares of our common stock or a performance cash award having a maximum value in excess of $3,000,000. Such limitations are designed to help assure that any deductions to which we would otherwise be entitled with respect to such awards will not be subject to the $1,000,000 limitation on the income tax deductibility of compensation paid to any covered executive officer imposed by Section 162(m) of the Code.

If a stock award granted under the 2013 plan expires or otherwise terminates without being exercised in full, or is settled in cash, the shares of our common stock not acquired pursuant to the stock award again will become available for subsequent issuance under the 2013 plan. In addition, the following types of shares of our common stock under the 2013 plan may become available for the grant of new stock awards under the 2013 plan: (1) shares that are forfeited to or repurchased by us prior to becoming fully vested; (2) shares withheld to satisfy income or employment withholding taxes; or (3) shares used to pay the exercise or purchase price of a stock award. Shares issued under the 2013 plan may be previously unissued shares or reacquired shares bought by us on the open market. As of the date hereof, no awards have been granted and no shares of our common stock have been issued under the 2013 plan.

Administration. Our board of directors, or a duly authorized committee thereof, has the authority to administer the 2013 plan. Our board of directors may also delegate to one or more of our officers the authority to

(1) designate employees (other than other officers) to be recipients of certain stock awards, and (2) determine the number of shares of common stock to be subject to such stock awards. Subject to the terms of the 2013 plan, our board of directors or the authorized committee, referred to herein as the plan administrator, determines recipients, dates of grant, the numbers and types of stock awards to be granted and the terms and conditions of the stock awards, including the period of their exercisability and vesting schedule applicable to a stock award. Subject to the limitations set forth below, the plan administrator will also determine the exercise price, strike price or purchase price of awards granted and the types of consideration to be paid for the award.

The plan administrator has the authority to modify outstanding awards under our 2013 plan. Subject to the terms of our 2013 plan, the plan administrator has the authority to reduce the exercise, purchase or strike price of any outstanding stock award, cancel any outstanding stock award in exchange for new stock awards, cash or other consideration, or take any other action that is treated as a repricing under generally accepted accounting principles, with the consent of any adversely affected participant.

Stock Options. ISOs and NSOs are granted pursuant to stock option agreements adopted by the plan administrator. The plan administrator determines the exercise price for a stock option, within the terms and conditions of the 2013 plan, provided that the exercise price of a stock option generally cannot be less than 100% of the fair market value of our common stock on the date of grant. Options granted under the 2013 plan vest at the rate specified by the plan administrator.

The plan administrator determines the term of stock options granted under the 2013 plan, up to a maximum of ten years. Unless the terms of an optionholder's stock option agreement provide otherwise, if an optionholder's service relationship with us, or any of our affiliates, ceases for any reason other than disability, death or cause, the optionholder may generally exercise any vested options for a period of three months following the cessation of service. The option term may be extended in the event that exercise of the option following such a termination of service is prohibited by applicable securities laws or our insider trading policy. If an optionholder's service relationship with us or any of our affiliates ceases due to disability or death, or an optionholder dies within a certain period following cessation of service, the optionholder or a beneficiary may generally exercise any vested options for a period of 12 months in the event of disability and 18 months in the event of death. In the event of a termination for cause, options generally terminate immediately upon the termination of the individual for cause. In no event may an option be exercised beyond the expiration of its term.

Acceptable consideration for the purchase of common stock issued upon the exercise of a stock option will be determined by the plan administrator and may include (1) cash, check, bank draft or money order, (2) a broker-assisted cashless exercise, (3) the tender of shares of our common stock previously owned by the optionholder, (4) a net exercise of the option if it is an NSO, and (5) other legal consideration approved by the plan administrator.

Unless the plan administrator provides otherwise, options generally are not transferable except by will, the laws of descent and distribution, or pursuant to a domestic relations order. An optionholder may designate a beneficiary, however, who may exercise the option following the optionholder's death.

Tax Limitations On Incentive Stock Options. The aggregate fair market value, determined at the time of grant, of our common stock with respect to ISOs that are exercisable for the first time by an optionholder during any calendar year under all of our stock plans may not exceed $100,000. Options or portions thereof that exceed such limit will generally be treated as NSOs. No ISO may be granted to any person who, at the time of the grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power or that of any of our affiliates unless (1) the option exercise price is at least 110% of the fair market value of the stock subject to the option on the date of grant, and (2) the term of the ISO does not exceed five years from the date of grant.

Restricted Stock Awards. Restricted stock awards are granted pursuant to restricted stock award agreements adopted by the plan administrator. Restricted stock awards may be granted in consideration for (1) cash, check, bank draft or money order, (2) services rendered to us or our affiliates, or (3) any other form of legal

consideration. Common stock acquired under a restricted stock award may, but need not, be subject to a share repurchase option in our favor in accordance with a vesting schedule to be determined by the plan administrator. Rights to acquire shares under a restricted stock award may be transferred only upon such terms and conditions as set by the plan administrator. Except as otherwise provided in the applicable award agreement, restricted stock unit awards that have not vested will be forfeited upon the participant's cessation of continuous service for any reason.

Restricted Stock Unit Awards. Restricted stock unit awards are granted pursuant to restricted stock unit award agreements adopted by the plan administrator. Restricted stock unit awards may be granted in consideration for any form of legal consideration. A restricted stock unit award may be settled by cash, delivery of stock, a combination of cash and stock as deemed appropriate by the plan administrator, or in any other form of consideration set forth in the restricted stock unit award agreement. Additionally, dividend equivalents may be credited in respect of shares covered by a restricted stock unit award. Except as otherwise provided in the applicable award agreement, restricted stock units that have not vested will be forfeited upon the participant's cessation of continuous service for any reason.

Stock Appreciation Rights. Stock appreciation rights are granted pursuant to stock appreciation grant agreements adopted by the plan administrator. The plan administrator determines the strike price for a stock appreciation right, which generally cannot be less than 100% of the fair market value of our common stock on the date of grant. Upon the exercise of a stock appreciation right, we will pay the participant an amount equal to the product of (1) the excess of the per share fair market value of our common stock on the date of exercise over the strike price, multiplied by (2) the number of shares of common stock with respect to which the stock appreciation right is exercised. A stock appreciation right granted under the 2013 plan vests at the rate specified in the stock appreciation right agreement as determined by the plan administrator.

The plan administrator determines the term of stock appreciation rights granted under the 2013 plan, up to a maximum of ten years. Unless the terms of a participant's stock appreciation right agreement provides otherwise, if a participant's service relationship with us or any of our affiliates ceases for any reason other than cause, disability or death, the participant may generally exercise any vested stock appreciation right for a period of three months following the cessation of service. The stock appreciation right term may be further extended in the event that exercise of the stock appreciation right following such a termination of service is prohibited by applicable securities laws. If a participant's service relationship with us, or any of our affiliates, ceases due to disability or death, or a participant dies within a certain period following cessation of service, the participant or a beneficiary may generally exercise any vested stock appreciation right for a period of 12 months in the event of disability and 18 months in the event of death. In the event of a termination for cause, stock appreciation rights generally terminate immediately upon the occurrence of the event giving rise to the termination of the individual for cause. In no event may a stock appreciation right be exercised beyond the expiration of its term.

Performance Awards. The 2013 plan permits the grant of performance-based stock and cash awards that may qualify as performance-based compensation that is not subject to the $1,000,000 limitation on the income tax deductibility of compensation paid to a covered executive officer imposed by Section 162(m) of the Code. To help assure that the compensation attributable to performance-based awards will so qualify, our compensation committee can structure such awards so that stock or cash will be issued or paid pursuant to such award only after the achievement of certain pre-established performance goals during a designated performance period.

The performance goals that may be selected include one or more of the following: (1) earnings (including earnings per share and net earnings); (2) earnings before interest, taxes and depreciation; (3) earnings before interest, taxes, depreciation and amortization; (4) earnings before interest, taxes, depreciation, amortization and legal settlements; (5) earnings before interest, taxes, depreciation, amortization, legal settlements and other income (expense); (6) earnings before interest, taxes, depreciation, amortization, legal settlements, other income (expense) and stock-based compensation; (7) earnings before interest, taxes, depreciation, amortization, legal settlements, other income (expense), stock-based compensation and changes in deferred revenue; (8) total

stockholder return; (9) return on equity or average stockholder's equity; (10) return on assets, investment, or capital employed; (11) stock price; (12) margin (including gross margin); (13) income (before or after taxes); (14) operating income; (15) operating income after taxes; (16) pre-tax profit; (17) operating cash flow; (18) sales or revenue targets; (19) increases in revenue or product revenue; (20) expenses and cost reduction goals; (21) improvement in or attainment of working capital levels; (22) economic value added (or an equivalent metric); (23) market share; (24) cash flow; (25) cash flow per share; (26) share price performance; (27) debt reduction; (28) implementation or completion of projects or processes (including, without limitation, clinical trial initiation, clinical trial enrollment, clinical trial results, new and supplemental indications for existing products, regulatory filing submissions, regulatory filing acceptances, regulatory or advisory committee interactions, regulatory approvals, and product supply); (29) stockholders' equity; (30) capital expenditures; (31) debt levels; (32) operating profit or net operating profit; (33) workforce diversity; (34) growth of net income or operating income; (35) billings; (36) bookings; (37) employee retention; (38) initiation of phases of clinical trials and/or studies by specific dates; (39) patient enrollment rates; (40) budget management; (41) submission to, or approval by, a regulatory body (including, but not limited to the U.S. Food and Drug Administration) of an applicable filing or a product candidate; (42) regulatory milestones; (43) progress of internal research or clinical programs; (44) progress of partnered programs; (45) partner satisfaction; (46) timely completion of clinical trials; (47) submission of INDs and new drug applications and other regulatory achievements; (48) research progress, including the development of programs; (49) strategic partnerships or transactions (including in-licensing and out-licensing of intellectual property; and (50) to the extent that an award is not intended to comply with Section 162(m) of the Code, other measures of performance selected by our board of directors.

The performance goals may be based on a company-wide basis, with respect to one or more business units, divisions, affiliates, or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. Unless specified otherwise (i) in the award agreement at the time the award is granted or (ii) in such other document setting forth the performance goals at the time the goals are established, we will appropriately make adjustments in the method of calculating the attainment of performance goals as follows: (1) to exclude restructuring and/or other nonrecurring charges; (2) to exclude exchange rate effects; (3) to exclude the effects of changes to generally accepted accounting principles; (4) to exclude the effects of any statutory adjustments to corporate tax rates; (5) to exclude the effects of any "extraordinary items" as determined under generally accepted accounting principles; (6) to exclude the dilutive effects of acquisitions or joint ventures; (7) to assume that any business divested by us achieved performance objectives at targeted levels during the balance of a performance period following such divestiture; (8) to exclude the effect of any change in the outstanding shares of our common stock by reason of any stock dividend or split, stock repurchase, reorganization, recapitalization, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to common stockholders other than regular cash dividends; (9) to exclude the effects of stock-based compensation and the award of bonuses under our bonus plans; (10) to exclude costs incurred in connection with potential acquisitions or divestitures that are required to be expensed under generally accepted accounting principles; (11) to exclude the goodwill and intangible asset impairment charges that are required to be recorded under generally accepted accounting principles; (12) to exclude the effect of any other unusual, non-recurring gain or loss or other extraordinary item; and (13) to exclude the effects of the timing of acceptance for review and/or approval of submissions to the FDA or any other regulatory body. In addition, we retain the discretion to reduce or eliminate the compensation or economic benefit due upon attainment of the performance goals and to define the manner of calculating the performance criteria we select to use for such performance period. The performance goals may differ from participant to participant and from award to award.

Other Stock Awards. The plan administrator may grant other awards based in whole or in part by reference to our common stock. The plan administrator will set the number of shares under the stock award and all other terms and conditions of such awards.

Changes to Capital Structure. In the event that there is a specified type of change in our capital structure, such as a stock split or recapitalization, appropriate adjustments will be made to (1) the class and maximum

number of shares reserved for issuance under the 2013 plan, (2) the class and maximum number of shares by which the share reserve may increase automatically each year, (3) the class and maximum number of shares that may be issued upon the exercise of ISOs, (4) the class and maximum number of shares subject to stock awards that can be granted in a calendar year (as established under the 2013 plan pursuant to Section 162(m) of the Code) and (5) the class and number of shares and exercise price, strike price, or purchase price, if applicable, of all outstanding stock awards.

Corporate Transactions. In the event of certain specified significant corporate transactions, the plan administrator has the discretion to take any of the following actions with respect to stock awards:

- arrange for the assumption, continuation or substitution of a stock award by a surviving or acquiring entity or parent company;
- arrange for the assignment of any reacquisition or repurchase rights held by us to the surviving or acquiring entity or parent company;
- accelerate the vesting of the stock award and provide for its termination prior to the effective time of the corporate transaction;
- arrange for the lapse of any reacquisition or repurchase right held by us;
- cancel or arrange for the cancellation of the stock award in exchange for such cash consideration, if any, as our board of directors may deem appropriate; or
- make a payment equal to the excess of (1) the value of the property the participant would have received upon exercise of the stock award over (2) the exercise price otherwise payable in connection with the stock award.

Our plan administrator is not obligated to treat all stock awards, even those that are of the same type, in the same manner.

Under the 2013 plan, a corporate transaction is generally the consummation of (1) a sale or other disposition of all or substantially all of our consolidated assets, (2) a sale or other disposition of at least 90% of our outstanding securities, (3) a merger, consolidation or similar transaction following which we are not the surviving corporation, or (4) a merger, consolidation or similar transaction following which we are the surviving corporation but the shares of our common stock outstanding immediately prior to such transaction are converted or exchanged into other property by virtue of the transaction.

Change of Control. The plan administrator may provide, in an individual award agreement or in any other written agreement between a participant and us that the stock award will be subject to additional acceleration of vesting and exercisability in the event of a change of control. For example, certain of our employees may receive an award agreement that provides for vesting acceleration upon the individual's termination without cause or resignation for good reason (including a material reduction in the individual's base salary, duties, responsibilities or authority, or a material relocation of the individual's principal place of employment with us) in connection with a change of control. Under the 2013 plan, a change of control is generally (1) the acquisition by a person or entity of more than 50% of our combined voting power other than by merger, consolidation or similar transaction; (2) a consummated merger, consolidation or similar transaction immediately after which our stockholders cease to own more than 50% of the combined voting power of the surviving entity; or (3) a consummated sale, lease or exclusive license or other disposition of all or substantially of our consolidated assets.

Amendment and Termination. Our board of directors has the authority to amend, suspend, or terminate our 2013 plan, provided that such action does not materially impair the existing rights of any participant without such participant's written consent. No ISOs may be granted after the tenth anniversary of the date our board of directors adopted our 2013 plan.

2012 Equity Incentive Plan

Our board of directors and our stockholders approved our 2012 plan, which became effective in January 2012, and was further amended by our board of directors and stockholders as of April 2012. As of June 30, 2013, there were 1,688,678 shares remaining available for the grant of stock awards under our 2012 plan and there were outstanding stock awards covering a total of 16,901,056 shares that were granted under our 2012 plan.

After the effective date of the 2013 plan, no additional awards will be granted under the 2012 plan, and all awards granted under the 2012 plan that are repurchased, forfeited, expire or are cancelled will become available for grant under the 2013 plan in accordance with its terms.

Stock Awards. The 2012 plan provides for the grant of ISO, NSOs, stock appreciation rights, restricted stock awards, restricted stock unit awards and other forms of stock awards, or collectively, stock awards, all of which may be granted to employees, including officers, non-employee directors and consultants of us and our affiliates. ISOs may be granted only to employees. All other awards may be granted to employees, including officers, and to non-employee directors and consultants.

Share Reserve. The aggregate number of shares of our common stock reserved for issuance pursuant to stock awards under the 2012 plan is 18,589,734 shares. The initial number of shares we reserved for issuance pursuant to stock awards under the 2012 plan was 3,747,920 shares, which was automatically increased in March 2012, April 2012 and June 2012 to a number of shares equal to 7%, 11% and 11%, respectively, of our fully-diluted capitalization as of immediately following our issuance of shares of our preferred stock at additional closings under our preferred stock financing, the initial closing for which was completed in January 2012. The maximum number of shares that may be issued upon the exercise of ISOs under our 2012 plan is 20,000,000 shares.

If a stock award granted under the 2012 plan expires or otherwise terminates without being exercised in full, or is settled in cash, the shares of our common stock not acquired pursuant to the stock award again will become available for subsequent issuance under the 2012 plan. In addition, the following types of shares under the 2012 plan may become available for the grant of new stock awards under the 2012 plan: (1) shares that are forfeited to or repurchased by us prior to becoming fully vested; (2) shares withheld to satisfy income or employment withholding taxes; or (3) shares used to pay the exercise or purchase price of a stock award. Shares issued under the 2012 plan may be previously unissued shares or reacquired shares bought by us on the open market.

Administration. Our board of directors, or a duly authorized committee thereof, has the authority to administer the 2012 plan. Our board of directors may also delegate to one or more of our officers the authority to (1) designate employees (other than other officers) to be recipients of certain stock awards, and (2) determine the number of shares of common stock to be subject to such stock awards. Subject to the terms of the 2012 plan, our board of directors or the authorized committee, referred to herein as the plan administrator, determines recipients, dates of grant, the numbers and types of stock awards to be granted and the terms and conditions of the stock awards, including the period of their exercisability and vesting schedule applicable to a stock award. Subject to the limitations set forth below, the plan administrator will also determine the exercise price, strike price or purchase price of awards granted and the types of consideration to be paid for the award.

The plan administrator has the authority to modify outstanding awards under our 2012 plan. Subject to the terms of our 2012 plan, the plan administrator has the authority to reduce the exercise, purchase or strike price of any outstanding stock award, cancel any outstanding stock award in exchange for new stock awards, cash or other consideration, or take any other action that is treated as a repricing under generally accepted accounting principles, with the consent of any adversely affected participant.

Stock Options. ISOs and NSOs are granted pursuant to stock option agreements adopted by the plan administrator. The plan administrator determines the exercise price for a stock option, within the terms and conditions of the 2012 plan, provided that the exercise price of a stock option generally cannot be less than 100%

of the fair market value of our common stock on the date of grant. Options granted under the 2012 plan vest at the rate specified by the plan administrator.

The plan administrator determines the term of stock options granted under the 2012 plan, up to a maximum of ten years. Unless the terms of an optionholder's stock option agreement provide otherwise, if an optionholder's service relationship with us, or any of our affiliates, ceases for any reason other than disability, death or cause, the optionholder may generally exercise any vested options for a period of three months following the cessation of service. The option term may be extended in the event that exercise of the option following such a termination of service is prohibited by applicable securities laws or our insider trading policy. If an optionholder's service relationship with us or any of our affiliates ceases due to disability or death, or an optionholder dies within a certain period following cessation of service, the optionholder or a beneficiary may generally exercise any vested options for a period of 12 months in the event of disability and 18 months in the event of death. In the event of a termination for cause, options generally terminate immediately upon the termination of the individual for cause. In no event may an option be exercised beyond the expiration of its term.

Acceptable consideration for the purchase of common stock issued upon the exercise of a stock option will be determined by the plan administrator and included in the option agreement and may include (1) cash, check, bank draft or money order, (2) a broker-assisted cashless exercise, (3) the tender of shares of our common stock previously owned by the optionholder, (4) a net exercise of the option if it is an NSO, (5) a deferred payment or similar arrangement subject to certain conditions and (6) other legal consideration approved by the plan administrator.

Unless the plan administrator provides otherwise, options generally are not transferable except by will, the laws of descent and distribution, or pursuant to a domestic relations order. An optionholder may designate a beneficiary, however, who may exercise the option following the optionholder's death.

Tax Limitations On Incentive Stock Options. The aggregate fair market value, determined at the time of grant, of our common stock with respect to ISOs that are exercisable for the first time by an optionholder during any calendar year under all of our stock plans may not exceed $100,000. Options or portions thereof that exceed such limit will generally be treated as NSOs. No ISO may be granted to any person who, at the time of the grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power or that of any of our affiliates unless (1) the option exercise price is at least 110% of the fair market value of the stock subject to the option on the date of grant, and (2) the option is not exercisable after the expiration of five years from the date of grant.

Restricted Stock Unit Awards. Restricted stock unit awards are granted pursuant to restricted stock unit award agreements adopted by the plan administrator. Restricted stock unit awards may be granted in consideration for any form of legal consideration approved by the plan administrator. A restricted stock unit award may be settled by cash, delivery of stock, a combination of cash and stock as deemed appropriate by the plan administrator, or in any other form of consideration set forth in the restricted stock unit award agreement. Additionally, dividend equivalents may be credited in respect of shares covered by a restricted stock unit award. Except as otherwise provided in the applicable award agreement, restricted stock units that have not vested will be forfeited upon the participant's cessation of continuous service for any reason.

Changes to Capital Structure. In the event that there is a specified type of change in our capital structure, such as a stock split or recapitalization, appropriate adjustments will be made to (a) the class and maximum number of shares reserved for issuance under the 2012 plan, (b) the class and maximum number of shares that may be issued upon the exercise of ISOs and (c) the class and number of shares and exercise price, strike price, or purchase price, if applicable, of all outstanding stock awards.

Corporate Transactions. Unless otherwise provided in a stock award agreement or other written agreement between us and a participant, in the event of certain specified significant corporate transactions, the plan administrator has the discretion to take any of the following actions with respect to stock awards:

- arrange for the assumption, continuation or substitution of a stock award by a surviving or acquiring entity or parent company;
- arrange for the assignment of any reacquisition or repurchase rights held by us to the surviving or acquiring entity or parent company;
- accelerate the vesting of the stock award and provide for its termination prior to the effective time of the corporate transaction;
- arrange for the lapse of any reacquisition or repurchase right held by us;
- cancel or arrange for the cancellation of the stock award in exchange for such cash consideration, if any, as our board of directors may deem appropriate; or
- make a payment equal to the excess of (a) the value of the property the participant would have received upon exercise of the stock award over (b) the exercise price otherwise payable in connection with the stock award.

Our plan administrator is not obligated to treat all stock awards, even those that are of the same type, in the same manner.

Under the 2012 plan, a corporate transaction is generally defined as the consummation of (1) a sale or other disposition of all or substantially all of our consolidated assets, (2) a sale or other disposition of at least 90% of our outstanding securities, (3) a merger, consolidation or similar transaction following which we are not the surviving corporation, or (4) a merger, consolidation or similar transaction following which we are the surviving corporation but the shares of our common stock outstanding immediately prior to such transaction are converted or exchanged into other property by virtue of the transaction.

Change of Control. The plan administrator may provide, in an individual award agreement or in any other written agreement between a participant and us that the stock award will be subject to additional acceleration of vesting and exercisability in the event of a change of control. Under the 2012 plan, a change of control is generally defined as (1) the acquisition by a person or entity of more than 50% of our combined voting power other than by merger, consolidation or similar transaction, (2) a consummated merger, consolidation or similar transaction immediately after which our stockholders cease to own more than 50% of the combined voting power of the surviving entity, (3) approval by the stockholders or our board of directors of a plan of complete dissolution or liquidation of us or our complete dissolution or liquidation occurs or (4) a consummated sale, lease or exclusive license or other disposition of all or substantially of our consolidated assets.

Amendment and Termination. The 2012 plan will terminate on January 25, 2022. However, our board of directors has the authority to amend, suspend, or terminate our 2012 plan, provided that such action does not materially impair the existing rights of any participant without such participant's written consent.

2001 Stock Option Plan

Our board of directors and our stockholders approved our 2001 plan, which became effective in December 2001 and was subsequently amended most recently in March 2008. The 2001 plan terminated and no further awards were granted under the 2001 plan upon the effective date of the 2012 plan. As of December 31, 2012, there were outstanding stock awards under our 2001 plan covering a total of 76,917 shares of our common stock.

Stock awards. The 2001 plan provides for the grant of ISOs and NSOs, or collectively, "stock options." NSOs may be granted to employees, including officers, non-employee directors and consultants of us and our affiliates. ISOs may be granted only to employees.

Share Reserve. Shares are no longer available for the grant of stock options under our 2001 plan. However, if a stock option granted under the 2001 plan expires or otherwise terminates without being exercised in full, the shares of our common stock not acquired pursuant to the stock option again will become available for subsequent issuance under the 2013 plan.

Administration. Our board of directors, or a duly authorized committee thereof, has the authority to administer the 2001 plan. Our board of directors may also delegate authority to one or more of our officers in certain circumstances under the 2001 plan. Subject to the terms of the 2001 plan, our board of directors or the authorized committee, referred to herein as the plan administrator, determines recipients, dates of grant, the numbers and types of stock options to be granted and the terms and conditions of the stock options, including the period of their exercisability and their vesting schedule. Subject to the limitations set forth below, the plan administrator will also determine the exercise price of stock options granted and the types of consideration to be paid for the award. In addition, the plan administrator has the authority to modify outstanding stock option award under our 2001 plan.

Stock Options. ISOs and NSOs are granted pursuant to stock option agreements adopted by the plan administrator. The plan administrator determines the exercise price for a stock option, within the terms and conditions of the 2001 plan, provided that the exercise price of an incentive stock option generally cannot be less than 100% of the fair market value of our common stock on the date of grant and the exercise price of a nonstatutory stock option generally cannot be less than 85% of the fair market value of our common stock on the date of grant. Options granted under the 2001 plan vest at the rate specified by the plan administrator.

The plan administrator determines the term of stock options granted under the 2001 plan, up to a maximum of ten years. Unless the terms of an optionholder's stock option agreement provide otherwise, if an optionholder's service relationship with us, or any of our affiliates, ceases for any reason other than disability or death, the optionholder may generally exercise any vested options for a period of three months following the cessation of service. The option term may be extended in the event that exercise of the option following such a termination of service is prohibited by applicable securities laws. If an optionholder's service relationship with us or any of our affiliates ceases due to disability or death, or an optionholder dies within a certain period following cessation of service, the optionholder or a beneficiary may generally exercise any vested options for a period of 12 months. In no event may an option be exercised beyond the expiration of its term.

Acceptable consideration for the purchase of common stock issued upon the exercise of a stock option will be determined by the plan administrator and may include (1) cash, check or cash equivalent, (2) by the tender of shares of our common stock previously owned by the optionholder, (3) cashless exercise (4) promissory note and (5) other legal consideration approved by the plan administrator.

Unless the plan administrator provides otherwise, options generally are not transferable except by will, the laws of descent and distribution.

Tax Limitations On Incentive Stock Options. The aggregate fair market value, determined at the time of grant, of our common stock with respect to ISOs that are exercisable for the first time by an optionholder during any calendar year under all of our stock plans may not exceed $100,000. Options or portions thereof that exceed such limit will generally be treated as NSOs. No ISO may be granted to any person who, at the time of the grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power or that of any of our affiliates unless (1) the option exercise price is at least 110% of the fair market value of the stock subject to the option on the date of grant, and (2) the term of the ISO does not exceed five years from the date of grant.

Changes to Capital Structure. In the event that there is a specified type of change in our capital structure, such as a stock split or recapitalization, appropriate adjustments will be made to (1) the class and maximum number of shares reserved for issuance under the 2001 plan, (2) the class and maximum number of shares that may be issued upon the exercise of ISOs, and (3) the class and number of shares and exercise price, strike price, or purchase price, if applicable, of all outstanding stock options.

Change of Control. In the event of certain change of control events, outstanding stock options may be assumed or substituted for substantially equivalent stock options by the surviving or acquiring corporation. If any surviving or acquiring corporation fails to assume or substitute such stock options, all outstanding stock options will terminate effective as of the date of the change of control. However, not all options will automatically terminate if the board of directors otherwise provides for such options in the event of a change of control triggered by the direct or indirect sale or exchange by our stockholders of more than 50% of our voting stock, where we are the surviving or continuing corporation and immediately after such sale or exchange less than 50% of the total combined voting power of our voting stock is held by another corporation or corporations that are members of an affiliated group. In addition, the plan administrator may provide for special vesting acceleration in an individual award agreement or in any other written agreement between a participant and us.

Under the 2001 plan, a change of control is generally defined as an ownership change event where our stockholders immediately before such event do not retain immediately thereafter, direct or indirect beneficial ownership of more than 50% of the total combined voting power of outstanding voting securities of us or the corporation or other entity to which our assets were transferred, as applicable, in substantially the same proportions as their ownership of shares of our voting stock immediately before such event. An ownership change event is generally defined as (1) the sale or exchange by our stockholders of more than 50% of our voting stock, (2) a merger or consolation in which we are a party, (3) the sale, exchange or transfer or all or substantially all of our assets or (4) our liquidation or dissolution.

2013 Employee Stock Purchase Plan

Our board of directors adopted the ESPP in September 2013, and we expect our stockholders will approve the ESPP prior to the execution and delivery of the underwriting agreement for this offering. The ESPP will become effective immediately upon the execution and delivery of the underwriting agreement related to this offering. The purpose of the ESPP is to retain the services of new employees and secure the services of new and existing employees while providing incentives for such individuals to exert maximum efforts toward our success and that of our affiliates.

Share Reserve. Following this offering, the ESPP authorizes the issuance of 2,070,000 shares of our common stock pursuant to purchase rights granted to our employees or to employees of any of our designated affiliates. The number of shares of our common stock reserved for issuance will automatically increase on January 1 of each calendar year, from January 1, 2014 (assuming the ESPP becomes effective before such date) through January 1, 2023 by the least of (1) 1% of the total number of shares of our common stock outstanding on December 31 of the preceding calendar year, (2) 4,800,000 shares, or (3) a number determined by our board of directors that is less than (1) and (2). The ESPP is intended to qualify as an “employee stock purchase plan” within the meaning of Section 423 of the Code. As of the date hereof, no shares of our common stock have been purchased under the ESPP.

Administration. Our board of directors has delegated its authority to administer the ESPP to our compensation committee. The ESPP is implemented through a series of offerings of purchase rights to eligible employees. Under the ESPP, we may specify offerings with durations of not more than 27 months, and may specify shorter purchase periods within each offering. Each offering will have one or more purchase dates on which shares of our common stock will be purchased for employees participating in the offering. An offering may be terminated under certain circumstances.

Payroll Deductions. Generally, all regular employees, including executive officers, employed by us or by any of our designated affiliates, may participate in the ESPP and may contribute, normally through payroll deductions, up to 15% of their earnings for the purchase of our common stock under the ESPP. Unless otherwise determined by our board of directors, common stock will be purchased for accounts of employees participating in the ESPP at a price per share equal to the lower of (1) 85% of the fair market value of a share of our common stock on the first date of an offering or (2) 85% of the fair market value of a share of our common stock on the date of purchase.

Limitations. Employees may have to satisfy one or more of the following service requirements before participating in the ESPP, as determined by our board of directors: (1) customarily employed for more than 20 hours per week, (2) customarily employed for more than five months per calendar year or (3) continuous employment with us or one of our affiliates for a period of time (not to exceed two years). No employee may purchase shares under the ESPP at a rate in excess of $25,000 worth of our common stock based on the fair market value per share of our common stock at the beginning of an offering for each year such a purchase right is outstanding. Finally, no employee will be eligible for the grant of any purchase rights under the ESPP if immediately after such rights are granted, such employee has voting power over 5% or more of our outstanding capital stock measured by vote or value pursuant to Section 424(d) of the Code.

Changes to Capital Structure. In the event that there occurs a change in our capital structure through such actions as a stock split, merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, large nonrecurring cash dividend, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or similar transaction, the board of directors will make appropriate adjustments to (1) the number of shares reserved under the ESPP, (2) the maximum number of shares by which the share reserve may increase automatically each year and (3) the number of shares and purchase price of all outstanding purchase rights.

Corporate Transactions. In the event of certain significant corporate transactions, including the consummation of: (1) a sale of all our assets, (2) the sale or disposition of 90% of our outstanding securities, (3) a merger or consolidation where we do not survive the transaction and (4) a merger or consolidation where we do survive the transaction but the shares of our common stock outstanding immediately prior to such transaction are converted or exchanged into other property by virtue of the transaction, any then-outstanding rights to purchase our stock under the ESPP may be assumed, continued or substituted for by any surviving or acquiring entity (or its parent company). If the surviving or acquiring entity (or its parent company) elects not to assume, continue or substitute for such purchase rights, then the participants' accumulated payroll contributions will be used to purchase shares of our common stock within ten business days prior to such corporate transaction, and such purchase rights will terminate immediately.

Plan Amendments, Termination. Our board of directors has the authority to amend or terminate our ESPP, provided that except in certain circumstances any such amendment or termination may not materially impair any outstanding purchase rights without the holder's consent. We will obtain stockholder approval of any amendment to our ESPP as required by applicable law or listing requirements.

Director Compensation

In 2012, we did not provide compensation to our non-employee directors. Historically, we have not paid cash or equity compensation to directors who are also our employees for their service on our board of directors, nor have we paid cash or equity compensation to our non-employee directors who are associated with our principal stockholders for service on our board of directors. We have reimbursed and will continue to reimburse all of our non-employee directors for their travel, lodging and other reasonable expenses incurred in attending meetings of our board of directors and committees of our board of directors. As of December 31, 2012, none of the non-employee members of our board of directors held outstanding stock options or other stock awards covering our shares of common stock. In connection with the appointment of Mr. Alton and Mr. Cooper to our board of directors in August 2013, we committed to grant each of Mr. Alton and Mr. Cooper an option to purchase the number of shares representing 0.10% of our fully-diluted common stock outstanding on the date of grant. The options will be granted following our board of directors' receipt of an independent third-party valuation of our common stock as of September 30, 2013. These options will vest annually over a three-year period from the date of Mr. Alton's and Mr. Cooper's appointment to our board of directors.

Our board of directors adopted a new compensation policy in September 2013 that will become effective upon the execution and delivery of the underwriting agreement related to this offering and will be applicable to

all of our non-employee directors. This compensation policy provides that each such non-employee director will receive the following compensation for service on our board of directors:

- an annual cash retainer of $30,000;
- an additional annual cash retainer of $25,000 for service as chairman of our board of directors;
- an additional annual cash retainer of $7,500, $5,000 and $3,000 for service on our audit committee, compensation committee and the nominating and corporate governance committee, respectively;
- an additional annual cash retainer of $15,000, $10,000 and $6,500 for service as chairman of the audit committee, compensation committee and the nominating and corporate governance committee, respectively;
- an annual option grant to purchase 10,000 shares of our common stock vesting one year following the grant date for serving on our board of directors; and
- upon first joining our board of directors following this offering or, with respect to all of our non-employee directors serving on the board of directors as of the closing of this offering, an automatic initial grant of an option to purchase 20,000 shares of our common stock vesting annually over a three-year period following the grant date; provided that the number of shares subject to Mr. Alton and Mr. Cooper's initial grant will be offset by the number of shares covered by the stock option grants made to each of them in connection with his appointment to our board of directors in August 2013.

Each of the option grants described above will vest and become exercisable subject to the director's continuous service with us, provided that each option will vest in full upon a change of control, as defined under our 2013 plan. The term of each option will be 10 years. The options will be granted under our 2013 plan, the terms of which are described in more detail above under "—Equity Benefit Plans—2013 Equity Incentive Plan."

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following includes a summary of transactions since January 1, 2010 to which we have been a party, in which the amount involved in the transaction exceeded $120,000, and in which any of our directors, executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change of control and other arrangements, which are described under “Executive and Director Compensation.”

Loan Arrangements

Since January 1, 2010, we have entered into various loan arrangements with beneficial owners of more than 5% of our capital stock, pursuant to which we have issued secured convertible promissory notes and unsecured convertible promissory notes. The notes carried interest at 12.0% per annum. Below is a summary of certain information relating to such notes as of and for the years ended December 31, 2012, 2011 and 2010:

	Years Ended December 31,		
	2012	2011	2010
		(in thousands)	
Principal amount of promissory notes issued	$ —	$12,350	$9,000
Largest aggregate principal amount outstanding	12,350	12,350	9,000
Aggregate interest expense accrued on notes payable	2,191	2,083	787
Principal and interest repaid	—	—	—
Principal and interest converted to equity	14,429	—	—

The participants in these loan arrangements included the following holders of more than 5% of our capital stock or entities affiliated with them. The following table presents the aggregate principal amount of secured convertible promissory notes and unsecured convertible promissory notes issued to these related parties in these loan arrangements:

Participants	Aggregate Principal Amount of Notes (in thousands)
Enterprise Partners and affiliated entities(1)	$ 5,839
Johnson & Johnson Development Corporation	$ 3,702
Venrock Partners and affiliated entities(2)	$ 2,809

(1) Consists of $2.7 million aggregate principal amount of notes issued to Enterprise Partners V, L.P., $3.0 million aggregate principal amount of notes issued to Enterprise Partners VI, L.P., and $0.1 million aggregate principal amount of notes issued to Enterprise Management, LLC.

(2) Consists of $0.5 million aggregate principal amount of notes issued to Venrock Partners, L.P.; $2.3 million aggregate principal amount of notes issued to Venrock Associates IV, L.P., and $0.1 million aggregate principal amount of notes issued to Venrock Entrepreneurs Fund IV, L.P.

In January 2012, the noteholders waived their right to receive payment of unpaid accrued interest under these notes in exchange for an aggregate of 10,615,900 shares of our common stock. See “Preferred Stock Financing” below for further information relating to the outstanding principal amounts under these notes.

Preferred Stock Financing

In January 2012, we issued and sold to investors an aggregate of 27,616,923 shares of our Series A-1 preferred stock and 12,138,080 shares of our Junior preferred stock, at a purchase price of $0.449 per share, for aggregate consideration of $17.8 million. Of this amount, $12.4 million was paid for by cancellation of principal indebtedness under the promissory notes described above under the caption “Loan Arrangements” and the balance was paid for in cash.

In March 2012, we issued and sold to investors an aggregate of 1,913,987 shares of Series A-1 preferred stock for aggregate cash consideration of $0.9 million. In April 2012, we issued and sold to Coöperatief LSP IV UA, or LSP, share capital in our Netherlands-based subsidiary, Celladon Europe B.V., or Celladon Europe, for aggregate cash consideration of $0.8 million, which share capital was immediately exchangeable for 1,683,327 shares of our Series A-1 preferred stock at the investor's election. In June 2012, in exchange for aggregate cash consideration of $43.1 million, we issued and sold to investors an additional 86,893,215 shares of our Series A-1 preferred stock, at a purchase price of $0.449 per share, and to LSP share capital in Celladon Europe exchangeable for 9,033,078 shares of our Series A-1 preferred stock. In June 2013, LSP exercised its option to exchange its share capital of Celladon Europe and we issued 10,716,405 shares of our Series A-1 preferred stock to LSP for no additional consideration.

The participants in this preferred stock financing included the following holders of more than 5% of our capital stock or entities affiliated with them. The following table presents the number of shares issued to these related parties in this financing:

Participants	Junior Preferred Stock	Series A-1 Preferred Stock
Coöperatief LSP IV UA	—	10,716,405
Enterprise Partners and affiliated entities(1)	5,741,267	7,056,980
Johnson & Johnson Development Corporation	3,655,435	4,630,591
GBS Bioventures IV	—	1,851,660
H&Q Healthcare Investors and affiliated entities(2)	—	1,851,660
Lundbeckfond Invest A/S	—	3,029,989
MPM Capital and affiliated entities(3)	—	1,851,660
Novartis Bioventures Ltd.	—	2,693,324
Pfizer Inc.	—	3,029,989
Venrock Partners and affiliated entities(4)	2,741,378	3,472,730

(1) Consists of 2,704,061 shares of Junior preferred stock and 3,263,997 shares of Series A-1 preferred stock issued to Enterprise Partners V, L.P.; 2,914,744 shares of Junior preferred stock and 3,660,409 shares of Series A-1 preferred stock issued to Enterprise Partners VI, L.P.; and 122,462 shares of Junior preferred stock and 132,574 shares of Series A-1 preferred stock issued to Enterprise Partners Management, LLC.

(2) Consists of 1,277,645 shares of Series A-1 preferred stock issued to H&Q Healthcare Investors and 574,015 shares of Series A-1 preferred stock issued to H&Q Life Sciences Investors.

(3) Consists of 1,735,451 shares of Series A-1 preferred stock issued to MPM BioVentures IV-QP, L.P.; 66,860 shares of Series A-1 preferred stock issued to MPM BioVentures IV GmbH & Co. Beteiligungs KG; and 49,439 shares of Series A-1 preferred stock issued to MPM Asset Management Investors BV4 LLC.

(4) Consists of 455,069 shares of Junior preferred stock and 576,474 shares of Series A-1 preferred stock issued to Venrock Partners, L.P.; 2,231,483 shares of Junior preferred stock and 2,826,803 shares of Series A-1 preferred stock issued to Venrock Associates IV, L.P.; and 54,826 shares of Junior preferred stock and 69,453 shares of Series A-1 preferred stock issued to Venrock Entrepreneurs Fund IV, L.P.

Certain of our directors have affiliations with the investors that participated in the loan arrangements and the preferred stock financing described above, as indicated in the table below:

Director	Principal Stockholder
Fouad Azzam, Ph.D.	Coöperatief LSP IV UA
Barbara Dalton, Ph.D.	Pfizer Inc.
Todd Foley	MPM Capital and affiliated entities
Joshua Funder, Ph.D.	GBS Bioventures IV
Johan Kördel, Ph.D.	Lundbeckfond Invest A/S
Daniel Omstead, Ph.D.	H&Q Healthcare Investors and affiliated entities
Andrew E. Senyei, M.D.	Enterprise Partners V, L.P. and affiliated entities
Lauren Silverman, Ph.D.	Novartis Bioventures Ltd.

Investor Agreements

In connection with our preferred stock financings, we entered into amended and restated investor rights, voting and right of first refusal and co-sale agreements containing voting rights, information rights, rights of first refusal and registration rights, among other things, with certain holders of our preferred stock and certain holders of our common stock, including all of the holders of more than 5% of our capital stock or entities affiliated with them. These stockholder agreements will terminate upon the closing of this offering, except for the amended and restated investor rights agreement which terminates seven years after the closing of the initial public offering, and contains certain registration rights as more fully described below in “Description of Capital Stock—Registration Rights.”

Employment Arrangements

We currently have written employment agreements with our executive officers. For information about our employment agreements with our named executive officers, refer to “Executive and Director Compensation—Employment Agreements with Executive Officers.”

Stock Options Granted to Executive Officers and Directors

We have granted stock options to our executive officers and directors, as more fully described in “Executive and Director Compensation—Outstanding Equity Awards at Fiscal Year-End.”

Indemnification Agreements

We have entered, and intend to continue to enter, into separate indemnification agreements with our directors and executive officers, in addition to the indemnification provided for in our amended and restated bylaws. These agreements, among other things, require us to indemnify our directors and executive officers for certain expenses, including attorneys’ fees, judgments, fines and settlement amounts incurred by a director or executive officer in any action or proceeding arising out of their services as one of our directors or executive officers or as a director or executive officer of any other company or enterprise to which the person provides services at our request. For more information regarding these indemnification arrangements, see “Management—Limitation on Liability and Indemnification of Directors and Officers.” We believe that these bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. A stockholder’s investment may decline in value to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions.

Policies and Procedures for Transactions with Related Persons

We have adopted a written related-person transactions policy that sets forth our policies and procedures regarding the identification, review, consideration and oversight of "related-person transactions." For purposes of our policy only, a "related-person transaction" is a transaction, arrangement or relationship (or any series of similar transactions, arrangements or relationships) in which we and any "related person" are participants involving an amount that exceeds $120,000.

Transactions involving compensation for services provided to us as an employee, consultant or director are not considered related-person transactions under this policy. A related person is any executive officer, director or a holder of more than 5% of our common stock, including any of their immediate family members and any entity owned or controlled by such persons.

Under the policy, where a transaction has been identified as a related-person transaction, management must present information regarding the proposed related-person transaction to our audit committee (or, where review by our audit committee would be inappropriate, to another independent body of our board of directors) for review. The presentation must include a description of, among other things, the material facts, the direct and indirect interests of the related persons, the benefits of the transaction to us and whether any alternative transactions are available. To identify related-person transactions in advance, we rely on information supplied by our executive officers, directors and certain significant stockholders. In considering related-person transactions, our audit committee or another independent body of our board of directors takes into account the relevant available facts and circumstances including, but not limited to:

- the risks, costs and benefits to us;
- the impact on a director's independence in the event the related person is a director, immediate family member of a director or an entity with which a director is affiliated;
- the terms of the transaction;
- the availability of other sources for comparable services or products; and
- the terms available to or from, as the case may be, unrelated third parties or to or from our employees generally.

In the event a director has an interest in the proposed transaction, the director must recuse himself or herself from the deliberations and approval.

PRINCIPAL STOCKHOLDERS

The following table sets forth information regarding beneficial ownership of our capital stock by:

- each person, or group of affiliated persons, known by us to beneficially own more than 5% of our common stock;
- each of our directors;
- each of our named executive officers; and
- all of our current executive officers and directors as a group.

The percentage ownership information under the column entitled “Before Offering” is based on 150,322,151 shares of common stock outstanding as of August 12, 2013, assuming conversion of all outstanding shares of our preferred stock into 139,278,610 shares of common stock. The percentage ownership information under the column entitled “After Offering” is based on the sale of shares of common stock in this offering.

Information with respect to beneficial ownership has been furnished by each director, officer or beneficial owner of more than 5% of our common stock. We have determined beneficial ownership in accordance with the rules of the SEC. These rules generally attribute beneficial ownership of securities to persons who possess sole or shared voting power or investment power with respect to those securities. In addition, the rules include shares of our common stock issuable pursuant to the exercise of stock options or warrants that are either immediately exercisable or exercisable on or before October 11, 2013, which is 60 days after August 12, 2013. These shares are deemed to be outstanding and beneficially owned by the person holding those options or warrants for the purpose of computing the percentage ownership of that person, but they are not treated as outstanding for the purpose of computing the percentage ownership of any other person. Unless otherwise indicated, the persons or entities identified in this table have sole voting and investment power with respect to all shares shown as beneficially owned by them, subject to applicable community property laws.

Except as otherwise noted below, the address for each person or entity listed in the table is c/o Celladon Corporation, 12760 High Bluff Drive, Suite 240, San Diego, California 92130.

Name and Address of Beneficial Owner	Number of shares beneficially owned	Percentage of shares beneficially owned	
		Before offering	After offering
Greater than 5% stockholders			
Entities affiliated with Enterprise Partners(1). 2223 Avenida de la Playa, Suite 205 La Jolla, CA 92037	22,526,369	15.0%	%
Lundbeckfond Invest A/S(2) Vestagervej 17 DK-2900 Hellerup Denmark	19,289,531	12.8%	%
Pfizer Inc c/o Pfizer Venture Investments 235 E. 42nd Street New York, NY 10017	19,289,531	12.8%	%
Novartis Bioventures Ltd. 131 Front Street Hamilton, HM 12 Bermuda	17,146,250	11.4%	%
Johnson & Johnson Development Corporation 410 George Street New Brunswick, NJ 08901	15,209,791	10.1%	%
GBS Bioventures IV(3).. Level 5, 71 Collins Street Melbourne, Vic 3000 Australia	11,788,047	7.8%	%
Entities affiliated with MPM Capital(4) The John Hancock Tower 200 Clarendon Street, 54th Floor Boston, MA 02116	11,788,047	7.8%	%
Entities affiliated with Venrock Partners(5) 3340 Hillview Ave. Palo Alto, CA 94304	11,421,458	7.6%	%
H&Q Healthcare Investors and H&Q Life Sciences Investors (6) 2 Liberty Square, 9th Floor Boston, MA 02109	10,723,875	7.1%	%
Coöperatief LSP IV UA(7) Johannes Vermeerplein 9 1071 DV Amsterdam The Netherlands	10,716,405	7.1%	%

Name and Address of Beneficial Owner	Number of shares beneficially owned	Percentage of shares beneficially owned	
		Before offering	After offering
Directors and Named Executive Officers			
Krisztina M. Zsebo, Ph.D.(8)	2,426,735	1.6%	%
Rebecque J. Laba (9)	569,814	*	*
Jeffrey J. Rudy (10)	569,814	*	*
Gregg Alton	—	*	*
Fouad Azzam, Ph.D.	—	*	*
Graham Cooper.	—	*	*
Barbara J. Dalton, Ph.D.	—	*	*
Todd Foley	—	*	*
Joshua Funder, Ph.D.	—	*	*
Johan Kördel, Ph.D.	—	*	*
Daniel Omstead, Ph.D.	—	*	*
Andrew E. Senyei, M.D.	—	*	*
Lauren Silverman, Ph.D.	—	*	*
All current executive officers and directors as a group (15 persons)(11)	4,107,594	2.7%	%

* Represents beneficial ownership of less than one percent

(1) Consists of 10,252,764 shares held by Enterprise Partners V, L.P., 11,911,464 shares held by Enterprise Partners VI, L.P. and 362,141 shares held by Enterprise Partners Management, LLC. Andrew E. Senyei, M.D., one of our directors, shares voting and investment power with respect to the foregoing shares. Dr. Senyei disclaims beneficial ownership of such shares except to the extent of his pecuniary interest therein.

(2) Johan Kördel, Ph.D., one of our directors, shares voting and investment power with respect to the shares held by Lundbeckfond Invest A/S. Dr. Kördel disclaims beneficial ownership of such shares except to the extent of his pecuniary interest therein.

(3) Joshua Funder, Ph.D., one of our directors, shares voting and investment power with respect to the shares held by GBS Bioventures IV. Dr. Funder disclaims beneficial ownership of such shares except to the extent of his pecuniary interest therein.

(4) Consists of 11,048,241 shares held by MPM BioVentures IV-QP, L.P., 425,642 shares held by MPM BioVentures IV GmbH & Co. Beteiligungs KG and 314,164 shares held by MPM Asset Management Investors BV4 LLC. MPM BioVentures IV LLC is the Managing Member of MPM BioVentures IV GP LLC, which is the General Partner of MPM BioVentures IV-QP, L.P. and the Managing Limited Partner of MPM BioVentures IV GmbH & Co. Beteiligungs KG. MPM BioVentures IV LLC is the Manager of MPM Asset Management Investors BV4 LLC. Todd Foley, one of our directors, is a Member of MPM BioVentures IV LLC and shares the power to vote, hold and dispose of the shares held by MPM BioVentures IV-QP, L.P., MPM Bio BioVentures IV GmbH & Co. Beteiligungs KG and MPM Asset Management Investors BV4 LLC. Mr. Foley and each such other Member of MPM BioVentures IV LLC disclaims beneficial ownership of the securities reported herein except to the extent of his respective pecuniary interest therein.

(5) Consists of 9,297,071 shares held by Venrock Associates IV, L.P., 228,424 shares held by Venrock Entrepreneurs Fund IV, L.P. and 1,895,963 shares held by Venrock Partners, L.P. The sole general partner of Venrock Associates IV, L.P. is Venrock Management IV, LLC. The sole general partner of Venrock Entrepreneurs Fund IV, L.P. is VEF Management IV, LLC. The sole general partner of Venrock Partners, L.P. is Venrock Partners Management, LLC. Venrock Management IV, LLC, VEF Management IV, LLC and Venrock Partners Management, LLC disclaim beneficial ownership over all shares held by Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P. and Venrock Partners, L.P., except to the extent of their pecuniary interests therein.

(6) Consists of 7,399,474 shares held by H&Q Healthcare Investors and 3,324,401 shares held by H&Q Life Sciences Investors (together with H&Q Healthcare Investors, the "H&Q Funds"). Tekla Capital Management LLC ("TCM"), the investment adviser to the H&Q Funds, and Daniel Omstead, Ph.D., one of our directors and the controlling member of TCM, have investment power with respect to the foregoing shares and share voting power with respect to the foregoing shares with the H&Q Funds. Neither TCM nor Dr. Omstead has any pecuniary interest therein.

(7) Fouad Azzam, Ph.D., one of our directors, shares voting and investment power with respect to the shares held by Coöperatief LSP IV UA. Dr. Azzam disclaims beneficial ownership of such shares except to the extent of his pecuniary interest therein.

(8) Represents 2,426,735 shares that Dr. Zsebo has the right to acquire from us within 60 days of August 12, 2013 pursuant to the exercise of stock options.

(9) Represents 569,814 shares that Ms. Laba has the right to acquire from us within 60 days of August 12, 2013 pursuant to the exercise of stock options.

(10) Represents 569,814 shares that Mr. Rudy has the right to acquire from us within 60 days of August 12, 2013 pursuant to the exercise of stock options.

(11) Represents 4,107,594 shares that all executive officers and directors as a group have the right to acquire from us within 60 days of August 12, 2013 pursuant to the exercise of stock options.

DESCRIPTION OF CAPITAL STOCK

The following is a summary of the rights of our common and preferred stock and some of the provisions of our amended and restated certificate of incorporation and amended and restated bylaws, which will become effective upon the closing of this offering, and of the Delaware General Corporation Law. This summary is not complete. For more detailed information, please see our amended and restated certificate of incorporation and amended and restated bylaws, which are filed as exhibits to the registration statement of which this prospectus is a part, as well as the relevant provisions of the Delaware General Corporation Law.

General

Upon closing of this offering and the filing of our amended and restated certificate of incorporation, our authorized capital stock will consist of 200,000,000 shares of common stock, par value $0.0001 per share and 10,000,000 shares of preferred stock, par value $0.0001 per share. All of our authorized preferred stock upon the closing of this offering will be undesignated.

Common Stock

Outstanding Shares

On June 30, 2013, there were 11,043,541 shares of common stock outstanding, held of record by 25 stockholders. Based on such number of shares of common stock outstanding as of June 30, 2013, and assuming (1) the conversion of all outstanding shares of our preferred stock which, at June 30, 2013, will convert into 139,278,610 shares of common stock in connection with the closing of this offering and (2) the issuance by us of shares of common stock in this offering, there will be shares of common stock outstanding upon closing of this offering.

As of June 30, 2013, there were 16,975,497 shares of common stock subject to outstanding options under our equity incentive plans and 8,777 shares of common stock issuable upon the exercise of outstanding warrants.

Voting

Our common stock is entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders, including the election of directors, and does not have cumulative voting rights. Accordingly, the holders of a majority of the shares of our common stock entitled to vote in any election of directors can elect all of the directors standing for election.

Dividends

Subject to preferences that may be applicable to any then outstanding preferred stock, the holders of common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

Liquidation

In the event of our liquidation, dissolution or winding up, holders of our common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities, subject to the satisfaction of any liquidation preference granted to the holders of any outstanding shares of preferred stock.

Rights and Preferences

Holders of our common stock have no preemptive, conversion or subscription rights, and there are no redemption or sinking fund provisions applicable to our common stock. The rights, preferences and privileges of

the holders of our common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

Fully Paid and Nonassessable

All of our outstanding shares of common stock are, and the shares of common stock to be issued in this offering will be, fully paid and nonassessable.

Preferred Stock

As of June 30, 2013, we had outstanding an aggregate of 139,278,610 shares of preferred stock held of record by 24 stockholders.

Upon closing of this offering, all outstanding shares of preferred stock at June 30, 2013, will convert into 139,278,610 shares of our common stock.

Immediately prior to closing of this offering, our certificate of incorporation will be amended and restated to delete all references to such shares of preferred stock. Under the amended and restated certificate of incorporation, our board of directors will have the authority, without further action by the stockholders, to issue up to 10,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding.

Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of the common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in our control that may otherwise benefit holders of our common stock and may adversely affect the market price of the common stock and the voting and other rights of the holders of common stock. We have no current plans to issue any shares of preferred stock.

Stock Options

As of June 30, 2013, 16,975,497 shares of common stock were issuable upon the exercise of outstanding stock options, at a weighted-average exercise price of $0.18 per share.

Warrants

As of June 30, 2013, 8,777 shares of our common stock were issuable upon exercise of outstanding warrants to purchase common stock with a weighted-average exercise price of $2.94 per share. These warrants provide for cashless exercise at the option of the holder, and also contain provisions for the adjustment of the number of shares issuable upon the exercise of the warrant in the event of stock splits, recapitalizations, reclassifications and consolidations. Upon closing of this offering, these warrants will be automatically cancelled if not previously exercised.

Registration Rights

Following the closing of this offering, certain holders of our common stock, or their transferees, will be entitled to the registration rights set forth below with respect to registration of the resale of such shares under the Securities Act pursuant to an amended and restated investors' rights agreement by and among us and certain of our stockholders.

Demand Registration Rights

At any time beginning on the earlier of (1) January 27, 2015 and (2) 180 days after the public offering date set forth on the cover page of this prospectus, upon the written request from the holders of 25% of the registrable securities (excluding registrable securities derived from our Junior preferred stock) then outstanding that we file a registration statement under the Securities Act with an anticipated aggregate price to the public of at least $5.0 million, we will be obligated to notify all holders of registrable securities of such request and to use our reasonable best efforts to register the sale of all registrable securities that holders may request to be registered. We are not required to effect more than two registration statements which are declared or ordered effective, subject to certain exceptions. We may postpone the filing of a registration statement for up to 90 days once in any 12-month period if in the good faith judgment of our board of directors such registration would be detrimental to us, and we are not required to effect the filing of a registration statement during the period beginning 90 days prior to our good faith estimate of the date of the filing of, and ending on a date 180 days following the effective date of the registration statement for this offering.

Form S-3 Registration Rights

If we are eligible to file a registration statement on Form S-3, holders of registrable securities have the right to demand that we file a registration statement on Form S-3 so long as the aggregate amount of securities to be sold under the registration statement on Form S-3 is at least $3.0 million, subject to specified exceptions, conditions and limitations.

"Piggyback" Registration Rights

If we register any securities for public sale, holders of registration rights will have the right to include their shares in the registration statement. The underwriters of any underwritten offering will have the right to limit the number of shares having registration rights to be included in the registration statement, but not below 33% of the total number of shares included in the registration statement, except this offering in which the holders have waived any and all rights to have their shares included.

Expenses of Registration

Generally, we are required to bear all registration and selling expenses incurred in connection with the demand, piggyback and Form S-3 registrations described above, other than underwriting discounts and commissions.

Expiration of Registration Rights

The demand, piggyback and Form S-3 registration rights discussed above will terminate seven years following the closing of this offering or, as to a given holder of registrable securities, when such holder is able to sell all of their registrable securities in a single 90-day period under Rule 144 of the Securities Act.

Anti-Takeover Effects of Provisions of Our Amended and Restated Certificate of Incorporation, Our Bylaws and Delaware Law

Delaware Anti-Takeover Law

We are subject to Section 203 of the Delaware General Corporation Law, or Section 203. Section 203 generally prohibits a public Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

- the interested stockholder owned at least 85% of the voting stock of the corporation outstanding upon consummation of the transaction, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the consummation of the transaction, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;
- subject to exceptions, any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder;
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; and
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Provisions of our amended and restated certificate of incorporation and amended and restated bylaws, which will become effective upon the closing of this offering, may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our amended and restated certificate of incorporation and amended and restated bylaws:

- permit our board of directors to issue up to 10,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate (including the right to approve an acquisition or other change in our control);
- provide that the authorized number of directors may be changed only by resolution adopted by a majority of the board of directors;
- provide that the board of directors or any individual director may only be removed with cause and the affirmative vote of the holders of at least 66 2/3% of the voting power of all of our then outstanding common stock;
- provide that all vacancies, including newly created directorships, may, except as otherwise required by law or subject to the rights of holders of preferred stock as designated from time to time, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide our board of directors into three classes;

- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner and also specify requirements as to the form and content of a stockholder's notice;
- do not provide for cumulative voting rights (therefore allowing the holders of a majority of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election, if they should so choose);
- provide that special meetings of our stockholders may be called only by the chairman of the board, our Chief Executive Officer or by the board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors (whether or not there exists any vacancies); and
- provide that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors or officers to us or our stockholders, (3) any action asserting a claim against the us arising pursuant to any provision of the DGCL or our certificate of incorporation or bylaws or (4) any action asserting a claim against us governed by the internal affairs doctrine.

The amendment of any of these provisions, with the exception of the ability of our board of directors to issue shares of preferred stock and designate any rights, preferences and privileges thereto, would require the affirmative vote of the holders of at least 66 2/3% of the voting power of all of our then outstanding common stock.

NASDAQ Global Market Listing

We have applied for listing of our common stock on the NASDAQ Global Market under the symbol "CLDN."

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is . The transfer agent and registrar's address is .

SHARES ELIGIBLE FOR FUTURE SALE

Immediately prior to this offering, there has been no public market for our common stock. Future sales of substantial amounts of common stock in the public market could adversely affect prevailing market prices. Furthermore, since only a limited number of shares will be available for sale shortly after this offering because of contractual and legal restrictions on resale described below, sales of substantial amounts of common stock in the public market after the restrictions lapse could adversely affect the prevailing market price for our common stock as well as our ability to raise equity capital in the future.

Based on the number of shares of common stock outstanding as of June 30, 2013, upon the closing of this offering and assuming (1) the 1-for- reverse stock split of all outstanding shares of our capital stock, (2) the conversion of our outstanding preferred stock into common stock, (3) no exercise of the underwriters' option to purchase additional shares of common stock and (4) no exercise of outstanding options or warrants, an aggregate of shares of common stock will be outstanding. All of the shares sold in this offering will be freely tradable in the public market without restriction or further registration under the Securities Act, unless held by an "affiliate" of ours, as such term is defined in Rule 144 of the Securities Act. Except as set forth below, the remaining shares of common stock outstanding after this offering will be restricted as a result of securities laws or lock-up agreements. In addition, any shares sold in this offering to entities affiliated with our existing stockholders and directors will be subject to lock-up agreements. These remaining shares will generally become available for sale in the public market as follows:

- No restricted shares will be eligible for immediate sale upon the closing of this offering;
- Up to restricted shares will be eligible for sale under Rule 144 or Rule 701 upon expiration of lock-up agreements at least 180 days after the date of this offering; and
- The remainder of the restricted shares will be eligible for sale from time to time thereafter upon expiration of their respective holding periods under Rule 144, but could be sold earlier if the holders exercise any available registration rights.

Rule 144

In general, under Rule 144 as currently in effect, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, any person who is not an affiliate of ours and has held their shares for at least six months, including the holding period of any prior owner other than one of our affiliates, may sell shares without restriction, provided current public information about us is available. In addition, under Rule 144, any person who is not an affiliate of ours and has held their shares for at least one year, including the holding period of any prior owner other than one of our affiliates, would be entitled to sell an unlimited number of shares immediately upon the closing of this offering without regard to whether current public information about us is available.

Beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours and who has beneficially owned restricted securities for at least six months, including the holding period of any prior owner other than one of our affiliates, is entitled to sell a number of restricted shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately shares immediately after this offering; or
- the average weekly trading volume of our common stock on the NASDAQ Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale.

Sales of restricted shares under Rule 144 held by our affiliates are also subject to requirements regarding the manner of sale, notice and the availability of current public information about us. Rule 144 also provides that

affiliates relying on Rule 144 to sell shares of our common stock that are not restricted shares must nonetheless comply with the same restrictions applicable to restricted shares, other than the holding period requirement.

Notwithstanding the availability of Rule 144, the holders of substantially all of our restricted shares have entered into lock-up agreements as described below and their restricted shares will become eligible for sale at the expiration of the restrictions set forth in those agreements.

Rule 701

Under Rule 701, shares of our common stock acquired upon the exercise of currently outstanding options or pursuant to other rights granted under our stock plans may be resold by:

- persons other than affiliates, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, subject only to the manner-of-sale provisions of Rule 144; and
- our affiliates, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, subject to the manner-of-sale and volume limitations, current public information and filing requirements of Rule 144, in each case, without compliance with the six-month holding period requirement of Rule 144.

As of June 30, 2013, options to purchase a total of 16,975,497 shares of common stock were outstanding, of which 5,535,202 were vested. Of the total number of shares of our common stock issuable under these options, substantially all are subject to contractual lock-up agreements with us or the underwriters described below under “Underwriting” and will become eligible for sale in accordance with Rule 701 at the expiration of those agreements.

Lock-Up Agreements

We, along with our directors, executive officers and substantially all of our other stockholders, optionholders and warrantholders, have agreed with the underwriters that for a period of 180 days (the restricted period), after the date of this prospectus, except with the prior written consent of J.P. Morgan Securities LLC and Barclays Capital Inc. and subject to specified exceptions, we or they will not offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, any shares of common stock or any securities convertible into or exercisable or exchangeable for shares of common stock, or enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the common stock. J.P. Morgan Securities LLC and Barclays Capital Inc. have advised us that they have no current intent or arrangement to release any of the shares subject to the lock-up agreements prior to the expiration of the lock-up period. Upon expiration of the restricted period, certain of our stockholders and warrantholders will have the right to require us to register their shares under the Securities Act. See “—Registration Rights” below and “Description of Capital Stock—Registration Rights.”

After this offering, certain of our employees, including our executive officers and/or directors, may enter into written trading plans that are intended to comply with Rule 10b5-1 under the Exchange Act. Sales under these trading plans would not be permitted until the expiration of the lock-up agreements relating to the offering described above.

Registration Rights

Upon closing of this offering, the holders of 139,278,610 shares of our common stock will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to the lock-up agreements described under “—Lock-Up Agreements” above. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares

purchased by affiliates, immediately upon the effectiveness of the registration statement of which this prospectus is a part. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock. See “Description of Capital Stock—Registration Rights.”

Equity Incentive Plans

We intend to file with the SEC a registration statement on Form S-8 under the Securities Act covering the shares of common stock reserved for issuance under the 2013 plan and the ESPP. The registration statement is expected to be filed and become effective as soon as practicable after the closing of this offering. Accordingly, shares registered under the registration statement will be available for sale in the open market following its effective date, subject to Rule 144 volume limitations and the lock-up agreements described above, if applicable.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS OF OUR COMMON STOCK

The following discussion describes the material U.S. federal income tax consequences of the acquisition, ownership and disposition of our common stock acquired in this offering by Non-U.S. Holders (as defined below). This discussion does not address all aspects of U.S. federal income taxes that may be relevant to Non-U.S. Holders in light of their particular circumstances, nor does it address any U.S. federal estate or gift tax, any state, local or non-U.S. tax consequences. Rules different from those described below may apply to certain Non-U.S. Holders that are subject to special treatment under the Code such as financial institutions, insurance companies, tax-exempt organizations, tax-qualified retirement plans, broker-dealers and traders in securities, commodities or currencies, U.S. expatriates, "controlled foreign corporations," "passive foreign investment companies," corporations that accumulate earnings to avoid U.S. federal income tax, persons that hold our common stock as part of a "straddle," "conversion transaction," or other risk reduction strategy, holders deemed to sell our common stock under the constructive sale provisions of the Code, holders who hold or receive our common stock pursuant to the exercise of employee stock options or otherwise as compensation, holders who are subject to the alternative minimum tax or Medicare contribution tax, partnerships and other pass-through entities, and investors in such pass-through entities or entities that are treated as disregarded entities for U.S. federal income tax purposes (regardless of their places of organization or formation). Such Non-U.S. Holders are urged to consult their own tax advisors to determine the U.S. federal, state, local and other tax consequences that may be relevant to them. Furthermore, the discussion below is based upon the provisions of the Code and Treasury regulations, published administrative pronouncements, rulings and judicial decisions thereunder as of the date hereof. Such authorities may be repealed, revoked or modified, perhaps retroactively, so as to result in U.S. federal income tax consequences different from those discussed below. We have not requested a ruling from the U.S. Internal Revenue Service, or the IRS, with respect to the statements made and the conclusions reached in the following summary. This discussion assumes that the Non-U.S. Holder holds our common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment).

The following discussion is for general information only and is not tax advice for any Non-U.S. Holder under its particular circumstances. Persons considering the purchase of our common stock pursuant to this offering should consult their own tax advisors concerning the U.S. federal income and estate tax consequences of acquiring, owning and disposing of our common stock in light of their particular situations as well as any consequences arising under the laws of any other taxing jurisdiction, including any state, local and non-U.S. tax consequences and any U.S. federal non-income tax consequences.

For the purposes of this discussion, a "Non-U.S. Holder" is, for U.S. federal income tax purposes, a beneficial owner of common stock that is not a U.S. Holder. A "U.S. Holder" means a beneficial owner of our common stock that is for U.S. federal income tax purposes (a) an individual who is a citizen or resident of the United States, (b) a corporation or other entity treated as a corporation created or organized in or under the laws of the United States, any state thereof or the District of Columbia, (c) an estate the income of which is subject to U.S. federal income taxation regardless of its source or (d) a trust if it (1) is subject to the primary supervision of a court within the United States and one or more U.S. persons have the authority to control all substantial decisions of the trust or (2) has a valid election in effect under applicable U.S. Treasury regulations to be treated as a U.S. person. Also, partnerships, or other entities that are treated as partnerships for U.S. federal income tax purposes (regardless of their place of organization or formation) and entities that are treated as disregarded entities for U.S. federal income tax purposes (regardless of their place of organization or formation) are not addressed by this discussion and are, therefore, not considered to be Non-U.S. Holders for the purposes of this discussion.

Distributions on Our Common Stock

Subject to the discussion below regarding backup withholding and foreign accounts, distributions, if any, made on our common stock to a Non-U.S. Holder of our common stock generally will constitute dividends for U.S. tax purposes to the extent made out of our current or accumulated earnings and profits (as determined under U.S. federal income tax principles) and will be subject to withholding tax at a 30% rate or such lower rate as may

be specified by an applicable income tax treaty. To obtain a reduced rate of withholding under a treaty, a Non-U.S. Holder generally will be required to provide us with a properly executed IRS Form W-8BEN, or other appropriate form, certifying the Non-U.S. Holder's entitlement to benefits under that treaty. In the case of a Non-U.S. Holder that is an entity, Treasury regulations and the relevant tax treaty provide rules to determine whether, for purposes of determining the applicability of a tax treaty, dividends will be treated as paid to the entity or to those holding an interest in that entity. If a Non-U.S. Holder holds stock through a financial institution or other agent acting on the holder's behalf, the holder will be required to provide appropriate documentation to such agent. The holder's agent will then be required to provide certification to the applicable withholding agent, either directly or through other intermediaries. If you are eligible for a reduced rate of U.S. federal withholding tax under an income tax treaty, you should consult with your own tax advisor to determine if you are able to obtain a refund or credit of any excess amounts withheld by timely filing an appropriate claim for a refund with the IRS.

We generally are not required to withhold tax on dividends paid to a Non-U.S. Holder that are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, are attributable to a permanent establishment that such holder maintains in the United States) if a properly executed IRS Form W-8ECI, stating that the dividends are so connected, is furnished to us (or, if stock is held through a financial institution or other agent, to such agent). In general, such effectively connected dividends will be subject to U.S. federal income tax, on a net income basis at the regular graduated rates, unless a specific treaty exemption applies. A corporate Non-U.S. Holder receiving effectively connected dividends may also be subject to an additional "branch profits tax," which is imposed, under certain circumstances, at a rate of 30% (or such lower rate as may be specified by an applicable treaty) on the corporate Non-U.S. Holder's effectively connected earnings and profits, subject to certain adjustments.

To the extent distributions on our common stock, if any, exceed our current and accumulated earnings and profits, they will first reduce your basis in our common stock as a non-taxable return of capital, but not below zero, and then any excess will be treated as gain and taxed in the same manner as gain realized from a sale or other disposition of common stock as described in the next section.

Gain on Disposition of Our Common Stock

Subject to the discussion below regarding backup withholding and foreign accounts, a Non-U.S. Holder generally will not be subject to U.S. federal income tax with respect to gain realized on a sale or other disposition of our common stock unless (a) the gain is effectively connected with a trade or business of such holder in the United States (and, if required by an applicable income tax treaty, is attributable to a permanent establishment that such holder maintains in the United States), (b) the Non-U.S. Holder is a nonresident alien individual and is present in the United States for 183 or more days in the taxable year of the disposition and certain other conditions are met, or (c) we are or have been a "United States real property holding corporation," or a USRPHC, within the meaning of Code Section 897(c)(2) at any time within the shorter of the five-year period preceding such disposition or such holder's holding period.

If you are a Non-U.S. Holder described in (a) above, you will be required to pay tax on the net gain derived from the sale at regular graduated U.S. federal income tax rates, unless a specific treaty exemption applies, and corporate Non-U.S. Holders described in (a) above may be subject to the additional branch profits tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty. If you are an individual Non-U.S. Holder described in (b) above, you will be required to pay a flat 30% tax on the gain derived from the sale, which gain may be offset by U.S. source capital losses (even though you are not considered a resident of the United States). With respect to (c) above, in general, we would be a USRPHC if interests in U.S. real estate constituted (by fair market value) at least half of our assets. We believe that we are not, and do not anticipate becoming, a USRPHC, however, there can be no assurance that we will not become a USRPHC in the future. Even if we are treated as a USRPHC, gain realized by a Non-U.S. Holder on a disposition of our common stock will not be subject to U.S. federal income tax so long as (1) the Non-U.S. Holder owned, directly, indirectly and constructively, no more than 5% of our common stock at all times within the shorter of (a) the five-year period

preceding the disposition or (b) the holder's holding period and (2) our common stock is regularly traded on an established securities market. There can be no assurance that our common stock will continue to qualify as regularly traded on an established securities market.

Information Reporting Requirements and Backup Withholding

Generally, we or certain financial middlemen must report information to the IRS with respect to any dividends we pay on our common stock including the amount of any such dividends, the name and address of the recipient, and the amount, if any, of tax withheld. A similar report is sent to the holder to whom any such dividends are paid. Pursuant to tax treaties or certain other agreements, the IRS may make its reports available to tax authorities in the recipient's country of residence.

Dividends paid by us (or our paying agents) to a Non-U.S. Holder may also be subject to U.S. backup withholding. U.S. backup withholding generally will not apply to a Non-U.S. Holder who provides a properly executed IRS Form W-8BEN or otherwise establishes an exemption.

Under current U.S. federal income tax law, U.S. information reporting and backup withholding requirements generally will apply to the proceeds of a disposition of our common stock effected by or through a U.S. office of any broker, U.S. or non-U.S., unless the holder provides a properly executed IRS Form W-8BEN or otherwise establishes an exemption. Generally, U.S. information reporting and backup withholding requirements will not apply to a payment of disposition proceeds to a Non-U.S. Holder where the transaction is effected outside the United States through a non-U.S. office of a non-U.S. broker. For information reporting purposes, certain brokers with substantial U.S. ownership or operations will generally be treated in a manner similar to U.S. brokers.

If backup withholding is applied to you, you should consult with your own tax advisor to determine if you are able to obtain a tax refund or credit with respect to the amount withheld.

Foreign Accounts

A U.S. federal withholding tax of 30% may apply to dividends and the gross proceeds of a disposition of our common stock paid to a foreign financial institution (as specifically defined by applicable rules), including when the foreign financial institution holds our common stock on behalf of a Non-U.S. Holder, unless such institution enters into an agreement with the U.S. government to withhold on certain payments and to collect and provide to the U.S. tax authorities substantial information regarding U.S. account holders of such institution (which may include certain equity holders of such institution, as well as certain account holders that are foreign entities with U.S. owners). Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing these withholding and reporting requirements may be subject to different rules. This U.S. federal withholding tax of 30% will also apply to dividends and the gross proceeds of a disposition of our common stock paid to a non-financial foreign entity unless such entity provides the withholding agent with either a certification that it does not have any substantial direct or indirect U.S. owners or provides information regarding direct and indirect U.S. owners of the entity. The withholding tax described above will not apply if the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from the rules. Under certain circumstances, a Non-U.S. Holder might be eligible for refunds or credits of such taxes. Holders are encouraged to consult with their own tax advisors regarding the possible implications of the legislation on their investment in our common stock.

The withholding provisions described above will generally apply to payments of dividends made on or after July 1, 2014 and to payments of gross proceeds from a sale or other disposition of common stock on or after January 1, 2017.

EACH PROSPECTIVE INVESTOR SHOULD CONSULT ITS OWN TAX ADVISOR REGARDING THE TAX CONSEQUENCES OF PURCHASING, HOLDING AND DISPOSING OF OUR COMMON STOCK, INCLUDING THE CONSEQUENCES OF ANY PROPOSED CHANGE IN APPLICABLE LAW, AS WELL AS TAX CONSEQUENCES ARISING UNDER ANY STATE, LOCAL, NON-U.S. OR U.S. FEDERAL NON-INCOME TAX LAWS.

UNDERWRITING

We are offering the shares of our common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC and Barclays Capital Inc. are acting as joint book running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the representatives. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of our common stock listed next to its name in the following table:

Name	Number of Shares
J.P. Morgan Securities LLC	
Barclays Capital Inc.	
Stifel, Nicolaus & Company Incorporated	
Wedbush Securities Inc.	
Total	

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

Certain of our existing principal stockholders or their affiliates and entities affiliated with certain of our directors have indicated an interest in purchasing an aggregate of approximately $ million in shares of our common stock in this offering at the initial public offering price. However, because indications of interest are not binding agreements or commitments to purchase, these stockholders may determine to purchase fewer shares than they indicate an interest in purchasing or not to purchase any shares in this offering. It is also possible that these stockholders could indicate an interest in purchasing more shares of our common stock. In addition, the underwriters could determine to sell fewer shares to any of these stockholders than the stockholders indicate an interest in purchasing or not to sell any shares to these stockholders.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial public offering of the shares, the offering price and other selling terms may be changed by the underwriters. Sales of shares made outside of the United States may be made by affiliates of the underwriters.

The underwriters have an option to buy up to additional shares of our common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this over-allotment option. If any shares are purchased with this over-allotment option, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without Over-allotment Exercise	With full Over-allotment Exercise
Per Share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $. We have also agreed to reimburse the underwriters for up to $20,000 of expenses related to the review of this offering by the Financial Industry Regulatory Authority.

A prospectus in electronic format may be made available on the websites maintained by one or more underwriters, or selling group members, if any, participating in the offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise transfer, dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or any securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of any shares of our common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of our common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC and Barclays Capital Inc. for a period of 180 days after the date of this prospectus, other than the (A) shares of our common stock to be sold pursuant to this offering, (B) the filing of a registration statement on Form S-8 relating to the shares of our common stock granted pursuant to or reserved for issuance under our stock plans described in this prospectus, (C) the issuance of equity-based awards and any shares issued upon exercise of such equity-based awards under our stock plans described in this prospectus, (D) the issuance by us of any shares of our common stock in connection with a licensing agreement, joint venture, acquisition or business combination or other collaboration or strategic transaction (including the filing of a registration statement on Form S-4 or other appropriate form with respect thereto); provided that, in the case of clauses (C) and (D), recipients of such shares of our common stock agree to be bound by the terms of the lock-up agreement described below and the sum of the aggregate number of shares of our common stock so issued shall not exceed 5% of the total outstanding shares of our common stock outstanding immediately following the consummation of this offering, and (E) any shares of our common stock issued upon the exercise of options granted under our stock plans described in this prospectus.

Our directors, executive officers and certain of our significant stockholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, for a period of 180 days after the date of this prospectus, may not, without the prior written consent of J.P. Morgan Securities LLC and Barclays Capital Inc. (1) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors,

executive officers, managers and members in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant) or publicly disclose the intention to make any offer, sale, pledge or disposition or (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of our common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or such other securities, in cash or otherwise, or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock, in each case subject to certain exceptions, including, (A) transfers of shares of common stock or other securities as a bona fide gift or gifts, (B) transfers or dispositions of shares of common stock or other securities to any trust for the direct or indirect benefit of the director, officer or stockholder and/or the immediate family of the such person in a transaction not involving a disposition for value, (C) transfers or dispositions of shares of common stock or other securities to any corporation, partnership, limited liability company or other entity all of the beneficial ownership interests of which are held by such director, officer or stockholder or the immediate family of such person in a transaction not involving a disposition for value, (D) transfers or dispositions of shares of common stock or other securities by will, other testamentary document or intestate succession to the legal representative, heir, beneficiary or a member of the immediate family of such director, officer or stockholder, (E) distributions of shares of common stock or other securities to partners, members, stockholders or trust beneficiaries of such director, officer or stockholder, (F) if such stockholder is a corporation, partnership, limited liability company, trust or other business entity the transfer of shares of common stock or other securities to another corporation, partnership, limited liability company, trust or other business entity that is a direct or indirect affiliate (as defined in Rule 405 promulgated under the Securities Act of 1933, as amended) of such stockholder, (G) the transfer of shares of common stock or other securities solely by operation of law, such as pursuant to a qualified domestic order or in connection with a divorce settlement, and (H) the transfer or disposal of shares of common stock or such other securities acquired in the this offering or on the open market following this offering. In the case of any transfer, disposition or distribution pursuant to clause (A), (B), (C), (D), (E) (F) or (G), each transferee, donee or distributee must execute and deliver to J.P. Morgan Securities LLC and Barclays Capital, Inc. a lock-up agreement. In addition, in the case of any transfer, disposition or distribution pursuant to clause (A), (B), (C), (D), (E) (F), (G) or (H), no filing by any party under the Exchange Act, or other public announcement may be required or voluntarily made in connection with such transfer, disposition or distribution, other than a filing on a Form 5 made after the expiration of the 180-day period referred to above. In addition, notwithstanding the foregoing restrictions, the director, officer or stockholder may (1) transfer such persons' common stock or any security convertible into or exercisable or exchangeable for common stock to us pursuant to any contractual arrangement in effect on the date of the lock-up agreement that provides for the repurchase of the such person's common stock or such other securities by us or in connection with the termination of such person's employment with us, provided that no filing by any party under the Exchange Act or other public announcement shall be required or shall be made voluntarily in connection with such transfer, disposition or distribution (other than a filing on a Form 5 made after the expiration of the 180-day period referred to above), (2) establish a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of common stock, provided that such plan does not provide for any transfers of common stock during the 180-day restricted period pursuant to the lock-up agreement and provided, further, that no filing with the SEC or other public announcement shall be required or voluntarily made by such person or any other person in connection therewith, (3) receive shares of common stock in connection with the vesting of restricted stock or the exercise of options to purchase shares of common stock, including any transfer for the payment of taxes due as a result of such vesting or exercise, whether by means of "net settlement" or otherwise (provided any such transfer shall only be permitted to us), provided that the underlying shares of common stock shall continue to be subject to the restrictions on transfer set forth in the lock-up agreement, (4) transfer shares of common stock or any security convertible into or exercisable or exchangeable for common stock pursuant to a bona fide third-party tender offer, merger, consolidation or other similar transaction made to all holders of our securities involving a change of control (including, without limitation, the entering into any lock-up, voting or similar agreement pursuant to which the undersigned may agree to transfer, sell, tender or otherwise dispose of our common stock or other such securities in connection with such transaction, or vote any of our common stock or other such securities in favor of any such transaction), and (5) convert outstanding shares of our preferred

stock into shares of common stock, provided that any such shares received upon such conversion shall be subject to the terms of the lock-up agreement.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

We have applied to have our common stock listed on The NASDAQ Global Market under the symbol “CLDN.”

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of our common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters of a greater number of shares of our common stock than they are required to purchase in this offering, and purchasing shares of our common stock on the open market to cover positions created by short sales. Short sales may be “covered” shorts, which are short positions in an amount not greater than the underwriters’ over-allotment option referred to above, or may be “naked” shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their over-allotment option, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the over-allotment option. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The NASDAQ Global Market, in the over the counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

Certain of the underwriters and their affiliates have provided in the past to us and our affiliates and may provide from time to time in the future certain commercial banking, financial advisory, investment banking and other services for us and such affiliates in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, from time to time, certain of the underwriters and their affiliates may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future.

Selling Restrictions

General

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), from and including the date on which the European Union Prospectus Directive (the "EU Prospectus Directive") was implemented in that Relevant Member State (the "Relevant Implementation Date") an offer of securities described in this prospectus may not be made to the public in that Relevant Member State prior to the publication of a prospectus in relation to the shares which has been approved by the competent authority in that Relevant Member State or, where appropriate, approved in another Relevant Member State and notified to the competent authority in that Relevant Member State, all in accordance with the EU Prospectus Directive, except that, with effect from and including the Relevant Implementation Date, an offer of securities described in this prospectus may be made to the public in that Relevant Member State at any time:

- to any legal entity which is a qualified investor as defined under the EU Prospectus Directive;
- to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150 natural or legal persons (other than qualified investors as defined in the EU Prospectus Directive); or
- in any other circumstances falling within Article 3(2) of the EU Prospectus Directive, provided that no such offer of securities described in this prospectus shall result in a requirement for the publication by us of a prospectus pursuant to Article 3 of the EU Prospectus Directive.

For the purposes of this provision, the expression an ''offer of securities to the public'' in relation to any securities in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the securities to be offered so as to enable an investor to decide to purchase or subscribe for the securities, as the same may be varied in that Member State by any measure implementing the EU Prospectus Directive in that Member State. The expression "EU Prospectus Directive" means Directive 2003/71/EC (and any amendments thereto, including the 2010 PD Amending Directive, to the

extent implemented in the Relevant Member State) and includes any relevant implementing measure in each Relevant Member State, and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

United Kingdom

Each of the underwriters has:

(1) only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act 2000, or FSMA), received by it in connection with the issue or sale of the securities in circumstances in which Section 21(1) of the FSMA does not apply to us; and

(2) complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to the securities in, from or otherwise involving the United Kingdom.

Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, us or the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

United Arab Emirates

This prospectus relates to an Exempt Offer in accordance with the Offered Securities Rules of the Dubai Financial Services Authority, or DFSA. This prospectus is intended for distribution only to persons of a type specified in the Offered Securities Rules of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus nor taken steps to verify the information set forth herein and has no responsibility for the prospectus. The shares to which this prospectus relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the shares offered should conduct their own due diligence on the shares. If you do not understand the contents of this prospectus you should consult an authorized financial advisor.

LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus will be passed upon for us by Cooley LLP, San Diego, California. As of the date of this prospectus, Cooley LLP beneficially owned less than one percent of the outstanding shares of our common stock. The underwriters are being represented by Latham & Watkins LLP, San Diego, California.

EXPERTS

Ernst & Young LLP, an independent registered public accounting firm, has audited our consolidated financial statements at December 31, 2012 and 2011, and for the year ended December 31, 2012, the six months ended December 31, 2011 and the fiscal year ended June 30, 2011, as set forth in their report. We have included our consolidated financial statements in this prospectus and elsewhere in the registration statement in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1, including exhibits and schedules, under the Securities Act, with respect to the shares of common stock being offered by this prospectus. This prospectus, which constitutes part of the registration statement, does not contain all of the information in the registration statement and its exhibits. For further information with respect to us and the common stock offered by this prospectus, we refer you to the registration statement and its exhibits. Statements contained in this prospectus as to the contents of any contract or any other document referred to are not necessarily complete, and in each instance, we refer you to the copy of the contract or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference.

You can read our SEC filings, including the registration statement, over the Internet at the SEC's website at www.sec.gov. You may also read and copy any document we file with the SEC at its public reference facilities at 100 F Street, NE, Washington, D.C. 20549. You may also obtain copies of these documents at prescribed rates by writing to the Public Reference Section of the SEC at 100 F Street, NE, Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference facilities. You may also request a copy of these filings, at no cost, by writing us at 12760 High Bluff Drive, Suite 240, San Diego, California or telephoning us at (858) 366-4288.

Upon the closing of this offering, we will be subject to the information reporting requirements of the Exchange Act, and we will file reports, proxy statements and other information with the SEC. These reports, proxy statements and other information will be available for inspection and copying at the public reference room and web site of the SEC referred to above. We also maintain a website at www.celladon.net, at which, following the closing of this offering, you may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Information contained on or accessible through our website is not a part of this prospectus, and the inclusion of our website address in this prospectus is an inactive textual reference only.

Celladon Corporation
(A Development Stage Company)

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of
Celladon Corporation

We have audited the accompanying consolidated balance sheets of Celladon Corporation, as of December 31, 2011 and 2012, and the related consolidated statements of operations and comprehensive loss, preferred stock and stockholders' deficit, and cash flows for the year ended December 31, 2012, the six-month period ended December 31, 2011, the fiscal year ended June 30, 2011, and the period from December 21, 2000 (inception) to December 31, 2012. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Celladon Corporation at December 31, 2012 and 2011, and the consolidated results of its operations and its cash flows for the year ended December 31, 2012, the six-month period ended December 31, 2011, the fiscal year ended June 30, 2011, and the period from December 21, 2000 (inception) to December 31, 2012, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

San Diego, California
September 6, 2013

Celladon Corporation
(A Development Stage Company)

Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2011	December 31, 2012	June 30, 2013	Pro Forma June 30, 2013
Assets			(unaudited)	(unaudited)
Current assets:				
Cash and cash equivalents	$ 468	$ 13,841	$ 8,319	
Short-term investments	–	18,808	19,658	
Prepaid expenses and other assets	30	288	304	
Total current assets	498	32,937	28,281	
Long-term investments	–	2,862	–	
Property and equipment, net	138	122	97	
Other assets	–	8	8	
Total assets	$ 636	$ 35,929	$ 28,386	
Liabilities, preferred stock and stockholders' deficit				
Current liabilities:				
Accounts payable and accrued expenses	$ 890	$ 1,134	$ 1,169	
Accrued clinical expenses	10	644	1,252	
Accrued interest	2,083	–	–	
Convertible notes	12,350	–	–	
Total current liabilities	15,333	1,778	2,421	
Deferred rent	–	28	42	
Redeemable non-controlling interest	–	4,814	–	
Commitments and contingencies (Note 5)				
Preferred stock, $0.0001 par value:				
Authorized shares - 51,367,139 at December 31, 2011, 143,732,952 at December 31, 2012 and 143,732,951 at June 30, 2013 (unaudited)				
Series A-1 redeemable convertible preferred stock:				
Authorized shares - none at December 31, 2011 and 131,594,871 at December 31, 2012 and June 30, 2013 (unaudited); issued and outstanding shares - none, 116,424,125 and 127,140,530 at December 31, 2011 and 2012 and June 30, 2013 (unaudited), respectively; liquidation preference - $104,549 and $114,172 at December 31, 2012 and June 30, 2013 (unaudited), respectively; no shares issued and outstanding, pro forma (unaudited)	–	52,274	60,098	$ –
Convertible preferred stock:				
Authorized shares - 51,367,139 at December 31, 2011 and 12,138,080 at December 31, 2012 and June 30, 2013 (unaudited); issued and outstanding shares - 39,186,807 at December 31, 2011 and 12,138,080 at December 31, 2012 and June 30, 2013 (unaudited); liquidation preference - $5,450 at December 31, 2012 and June 30, 2013 (unaudited); no shares issued and outstanding, pro forma (unaudited)	56,282	5,450	5,450	–
Special voting preferred:				
Authorized, issued and outstanding shares - none, one and none at December 31, 2011, December 31, 2012 and June 30, 2013 (unaudited), respectively; no shares authorized, issued and outstanding, pro forma (unaudited)	–	1	–	–
Stockholders' equity (deficit):				
Common stock, $0.0001 par value; authorized shares - 67,867,000 at December 31, 2011 and 172,249,444 at December 31, 2012 and June 30, 2013 (unaudited); issued and outstanding - 35,079 at December 31, 2011 and 11,043,541 at December 31, 2012 and June 30, 2013 (unaudited); 150,322,151 shares issued and outstanding, pro forma (unaudited)	5,895	1	1	150
Additional paid-in capital	–	64,165	61,326	126,725
Accumulated other comprehensive income	–	9	2	2
Deficit accumulated during the development stage	(76,874)	(92,591)	(100,954)	(100,954)
Total stockholders' equity (deficit)	(70,979)	(28,416)	(39,625)	$ 25,923
Total liabilities, preferred stock and stockholders' deficit	$ 636	$ 35,929	$ 28,386	

See accompanying notes.

Celladon Corporation
(A Development Stage Company)

Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share data)

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Period From December 21, 2000 (inception) to December 31, 2012	Six Months Ended June 30, 2012 (unaudited)	Six Months Ended June 30, 2013	Period From December 21, 2000 (inception) to June 30, 2013 (unaudited)
Operating expenses:							
Research and development	$ 4,193	$ 1,252	$ 13,314	$ 75,117	$ 7,867	$ 7,136	$ 82,253
General and administrative	1,832	920	2,631	16,485	1,383	1,328	17,813
Total operating expenses	6,025	2,172	15,945	91,602	9,250	8,464	100,066
Loss from operations	(6,025)	(2,172)	(15,945)	(91,602)	(9,250)	(8,464)	(100,066)
Other income (expense):							
Interest income	7	–	35	606	2	44	650
Interest expense	(1,124)	(689)	(108)	(2,298)	(108)	–	(2,298)
Other income (expense)	152	–	147	549	(55)	(39)	510
Consolidated net loss	(6,990)	(2,861)	(15,871)	(92,745)	(9,411)	(8,459)	(101,204)
Net loss attributable to non-controlling interest	–	–	154	154	72	96	250
Net loss attributable to Celladon Corporation	(6,990)	(2,861)	(15,717)	(92,591)	(9,339)	(8,363)	(100,954)
Accretion to redemption value of redeemable convertible preferred stock	–	–	(343)	(343)	(341)	–	(343)
Change in fair value of non-controlling interest	–	–	(154)	(154)	(72)	(3,105)	(3,259)
Net loss attributable to common stockholders	$ (6,990)	$ (2,861)	$ (16,214)	$ (93,088)	$ (9,752)	$ (11,468)	$ (104,556)
Other comprehensive loss:							
Unrealized gain (loss) on investments	–	–	9	9	–	(7)	2
Comprehensive loss	$ (6,990)	$ (2,861)	$ (15,862)	$ (92,736)	$ (9,411)	$ (8,466)	$ (101,202)
Net loss per share attributable to common stockholders, basic and diluted	$(217.66)	$ (81.56)	$ (1.58)		$ (1.03)	$ (1.04)	
Weighted-average shares outstanding, basic and diluted	32,115	35,079	10,261,532		9,470,930	11,043,541	
Pro forma net loss per share attributable to common stockholders, basic and diluted (unaudited)			$ (0.15)			$ (0.06)	
Pro forma weighted-average shares outstanding, basic and diluted (unaudited)			107,053,441			150,322,151	

See accompanying notes.

Celladon Corporation
(A Development Stage Company)

Consolidated Statements of Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Series A-1 Redeemable Convertible Preferred Stock		Convertible Preferred Stock		Special Voting Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Deficit Accumulated During the Development Stage	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balance at December 21, 2000	–	$ –	–	$ –	–	$ –	–	$ –	$ –	$ –	$ –	$ –
Issuance of common stock to founders	–	–	–	–	–	–	7,541	16	–	–	–	16
Net income through June 30, 2003	–	–	–	–	–	–	–	–	–	–	27	27
Balance at June 30, 2003	–	–	–	–	–	–	7,541	16	–	–	27	43
Issuance of common stock to founders	–	–	–	–	–	–	121	145	–	–	–	145
Net loss	–	–	–	–	–	–	–	–	–	–	(658)	(658)
Balance at June 30, 2004	–	–	–	–	–	–	7,662	161	–	–	(631)	(470)
Issuance of common stock to founders	–	–	–	–	–	–	16,333	151	–	–	–	151
Issuance of Series A convertible preferred stock at $1.00 per share, net of $104 of offering costs	–	–	4,000,000	3,896	–	–	–	–	–	–	–	–
Stock-based compensation	–	–	–	–	–	–	–	1	–	–	–	1
Net loss	–	–	–	–	–	–	–	–	–	–	(2,576)	(2,576)
Balance at June 30, 2005	–	–	4,000,000	3,896	–	–	23,995	313	–	–	(3,207)	(2,894)
Issuance of common stock to founders	–	–	–	–	–	–	113	1	–	–	–	1
Issuance of Series A convertible preferred stock at $1.00 per share	–	–	500,000	500	–	–	–	–	–	–	–	–
Issuance of Series B convertible preferred stock at $1.10 per share, net of $76 of offering costs	–	–	6,909,093	7,524	–	–	–	–	–	–	–	–
Conversion of Series B convertible preferred stock to common stock	–	–	(4,000,068)	(4,400)	–	–	4,000	4,400	–	–	–	4,400
Stock-based compensation	–	–	–	–	–	–	–	4	–	–	–	4
Net loss	–	–	–	–	–	–	–	–	–	–	(9,745)	(9,745)
Balance at June 30, 2006	–	–	7,409,025	7,520	–	–	28,108	4,718	–	–	(12,952)	(8,234)

See accompanying notes.

Celladon Corporation
(A Development Stage Company)

Consolidated Statements of Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Series A-1 Redeemable Convertible Preferred Stock		Convertible Preferred Stock		Special Voting Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Deficit Accumulated During the Development Stage	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balance at June 30, 2006	–	$ –	7,409,025	$ 7,520	–	$ –	28,108	$ 4,718	$ –	$ –	$ (12,952)	$ (8,234)
Issuance of Series B convertible preferred stock at $1.10 per share, net of $27 of offering costs	–	–	10,000,000	10,973	–	–	–	–	–	–	–	–
Issuance of Series B-1 convertible preferred stock at $1.80 per share, net of $57 of offering costs	–	–	2,222,223	3,943	–	–	–	–	–	–	–	–
Stock-based compensation	–	–	–	–	–	–	–	102	–	–	–	102
Net loss	–	–	–	–	–	–	–	–	–	–	(14,200)	(14,200)
Balance at June 30, 2007	–	–	19,631,248	22,436	–	–	28,108	4,820	–	–	(27,152)	(22,332)
Issuance of Series B-1 convertible preferred stock at $1.80 per share, net of $5 of offering costs	–	–	6,666,669	11,996	–	–	–	–	–	–	–	–
Issuance of Series B-1 convertible preferred stock	–	–	39,568	75	–	–	–	–	–	–	–	–
Issuance of Series C convertible preferred stock at $1.80 per share, net of $44 of offering costs	–	–	5,555,556	9,956	–	–	–	–	–	–	–	–
Issuance of common stock for services	–	–	–	–	–	–	347	–	–	–	–	–
Stock-based compensation	–	–	–	–	–	–	–	166	–	–	–	166
Net loss	–	–	–	–	–	–	–	–	–	–	(12,381)	(12,381)
Balance at June 30, 2008	–	–	31,893,041	44,463	–	–	28,455	4,986	–	–	(39,533)	(34,547)
Issuance of Series B-1 convertible preferred stock at $1.90 per share	–	–	36,034	68	–	–	–	–	–	–	–	–
Cancellation of Series B-1 convertible preferred stock	–	–	(75,602)	(56)	–	–	–	–	–	–	–	–
Issuance of Series C convertible preferred stock at $1.80 per share	–	–	5,000,000	8,999	–	–	–	–	–	–	–	–
Stock-based compensation	–	–	–	–	–	–	–	221	–	–	–	221
Net loss	–	–	–	–	–	–	–	–	–	–	(17,752)	(17,752)
Balance at June 30, 2009	–	–	36,853,473	53,474	–	–	28,455	5,207	–	–	(57,285)	(52,078)

See accompanying notes.

Celladon Corporation
(A Development Stage Company)

Consolidated Statements of Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Series A-1 Redeemable Convertible Preferred Stock		Convertible Preferred Stock		Special Voting Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Deficit Accumulated During the Development Stage	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balance at June 30, 2009	–	$ –	36,853,473	$ 53,474	–	$ –	28,455	$ 5,207	$ –	$ –	$ (57,285)	$ (52,078)
Issuance of common stock	–	–	–	–	–	–	500	9	–	–	–	9
Issuance of Series C convertible preferred stock at $1.80 per share	–	–	1,555,556	2,800	–	–	–	–	–	–	–	–
Issuance of Series C convertible preferred stock at $0.01 per share upon the exercise of warrants	–	–	777,778	8	–	–	–	–	–	–	–	–
Stock-based compensation	–	–	–	–	–	–	–	290	–	–	–	290
Net loss	–	–	–	–	–	–	–	–	–	–	(9,738)	(9,738)
Balance at June 30, 2010	–	–	39,186,807	56,282	–	–	28,955	5,506	–	–	(67,023)	(61,517)
Issuance of common stock	–	–	–	–	–	–	6,124	90	–	–	–	90
Stock-based compensation	–	–	–	–	–	–	–	217	–	–	–	217
Net loss	–	–	–	–	–	–	–	–	–	–	(6,990)	(6,990)
Balance at June 30, 2011	–	–	39,186,807	56,282	–	–	35,079	5,813	–	–	(74,013)	(68,200)
Stock-based compensation	–	–	–	–	–	–	–	82	–	–	–	82
Net loss	–	–	–	–	–	–	–	–	–	–	(2,861)	(2,861)
Balance at December 31, 2011	–	–	39,186,807	56,282	–	–	35,079	5,895	–	–	(76,874)	(70,979)

See accompanying notes.

Celladon Corporation
(A Development Stage Company)

Consolidated Statements of Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Series A-1 Redeemable Convertible Preferred Stock		Convertible Preferred Stock		Special Voting Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Deficit Accumulated During the Development Stage	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balance at December 31, 2011	–	$ –	39,186,807	$ 56,282	–	$ –	35,079	$ 5,895	$ –	$ –	$ (76,874)	$ (70,979)
Issuance of common stock	–	–	–	–	–	–	696	–	–	–	–	–
Conversion of Series A, B, B-1 and C preferred stock to common stock	–	–	(39,186,807)	(56,282)	–	–	391,866	56,282	–	–	–	56,282
Issuance of preferred stock and common stock in connection with conversion of debt and accrued interest	15,160,301	6,807	12,138,080	5,450	–	–	10,615,900	2,188	–	–	–	2,188
Delaware reincorporation	–	–	–	–	–	–	–	(64,167)	64,167	–	–	–
Issuance of special voting stock	–	–	–	–	1	1	–	–	–	–	–	–
Issuance of Series A-1 preferred stock, net of $343 of offering costs	101,263,824	45,124	–	–	–	–	–	–	–	–	–	–
Accretion to redemption value of redeemable convertible preferred stock	–	343	–	–	–	–	–	(252)	(91)	–	–	(343)
Stock-based compensation	–	–	–	–	–	–	–	55	243	–	–	298
Change in fair value of redeemable non-controlling interest	–	–	–	–	–	–	–	–	(154)	–	–	(154)
Consolidated net loss	–	–	–	–	–	–	–	–	–	–	(15,871)	(15,871)
Net loss attributable to redeemable non-controlling interest	–	–	–	–	–	–	–	–	–	–	154	154
Unrealized gain on investment securities	–	–	–	–	–	–	–	–	–	9	–	9
Balance at December 31, 2012	116,424,125	52,274	12,138,080	5,450	1	1	11,043,541	1	64,165	9	(92,591)	(28,416)
Stock-based compensation (unaudited)	–	–	–	–	–	–	–	–	266	–	–	266
Change in fair value of redeemable non-controlling interest (unaudited)	–	–	–	–	–	–	–	–	(3,105)	–	–	(3,105)
Share exchange related to non-controlling interest (unaudited)	10,716,405	7,824	–	–	(1)	(1)	–	–	–	–	–	–
Consolidated net loss (unaudited)	–	–	–	–	–	–	–	–	–	–	(8,459)	(8,459)
Net loss attributable to redeemable non-controlling interest (unaudited)	–	–	–	–	–	–	–	–	–	–	96	96
Unrealized loss on investment securities (unaudited)	–	–	–	–	–	–	–	–	–	(7)	–	(7)
Balance at June 30, 2013 (unaudited)	127,140,530	$ 60,098	12,138,080	$ 5,450	–	$ –	11,043,541	$ 1	$ 61,326	$ 2	$ (100,954)	$ (39,625)

See accompanying notes.

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Consolidated Statements of Cash Flows
(in thousands)

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Period From December 21, 2000 (inception) to December 31, 2012	Six Months Ended June 30, 2012	Six Months Ended June 30, 2013	Period From December 21, 2000 (inception) to June 30, 2013
Cash flows from operating activities					(unaudited)		(unaudited)
Consolidated net loss	$ (6,990)	$ (2,861)	$ (15,871)	$ (92,745)	$ (9,411)	$ (8,459)	$ (101,204)
Adjustments to reconcile net loss to net cash (used in) operating activities							
Depreciation	73	31	64	406	31	33	439
Stock-based compensation	217	82	298	1,687	131	266	1,953
Foregiveness of notes receivable	–	–	–	72	–	–	72
Noncash interest expense	1,123	683	108	2,191	108	–	2,191
Amortization of investment premium (discount)	–	–	124	124	–	171	295
Loss on disposal of property and equipment	92	–	–	92	–	–	92
Deferred rent	–	–	28	28	15	20	48
Changes in operating assets and liabilities:							
Prepaid expenses and other assets	133	(6)	(266)	(296)	(70)	(16)	(312)
Accounts payable and accrued expenses	(259)	489	878	1,778	310	637	2,415
Net cash used in operating activities	(5,611)	(1,582)	(14,637)	(86,663)	(8,886)	(7,348)	(94,011)
Cash flows from investing activities							
Purchases of investment securities	–	–	(26,751)	(26,751)	–	(14,366)	(41,117)
Proceeds from maturities of investment securities	–	–	4,966	4,966	–	16,200	21,166
Purchases of property and equipment	(2)	–	(48)	(679)	(32)	(8)	(687)
Proceeds from sale of property and equipment	37	–	–	59	–	–	59
Net cash provided by (used in) investing activities	35	–	(21,833)	(22,405)	(32)	1,826	(20,579)
Cash flows from financing activities							
Proceeds from issuance of common stock	90	–	–	106	–	–	106
Proceeds from issuance of preferred stock, net	–	–	45,140	105,822	45,142	–	105,822
Proceeds from issuance of exchangeable shares	–	–	4,814	4,814	4,814	–	4,814
Proceeds from issuance of convertible debt	4,400	1,450	–	12,350	–	–	12,350
Repayment of convertible debt	–	–	(111)	(111)	(111)	–	(111)
Proceeds from equipment loan	–	–	–	175	–	–	175
Repayment of equipment loan	(18)	–	–	(175)	–	–	(175)
Issuance of notes receivable	–	–	–	(72)	–	–	(72)
Net cash provided by financing activities	4,472	1,450	49,843	122,909	49,845	–	122,909
Net (decrease) increase in cash and cash equivalents	(1,104)	(132)	13,373	13,841	40,927	(5,522)	8,319
Cash and cash equivalents, beginning of period	1,704	600	468	–	468	13,841	–
Cash and cash equivalents, end of period	$ 600	$ 468	$ 13,841	$ 13,841	$ 41,395	$ 8,319	$ 8,319
Supplemental disclosure of cash flow information							
Interest paid	$ 1	$ 6	$ –	$ 107	$ –	$ –	$ 107
Supplemental schedule of noncash investing and financing activities							
Conversion of convertible debt and accrued interest for Series A-1 and Junior preferred stock and common stock	$ –	$ –	$ 14,430	$ 14,430	$ 14,430	$ –	$ 14,430
Share exchange related to non-controlling interest and special voting stock	$ –	$ –	$ –	$ –	$ –	$ 7,824	$ 7,824

See accompanying notes.

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(Information as of June 30, 2013 and thereafter and for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013 is unaudited)

1. Organization and Summary of Significant Accounting Policies

Organization

Celladon Corporation (Celladon or the Company) was incorporated in California on December 21, 2000 (inception) and reincorporated in Delaware in April 2012. The Company changed its fiscal year end from June 30 to December 31, effective for the fiscal period ended December 31, 2011. The Company is a biotechnology company focused on developing treatments for heart failure, diabetes and neurodegenerative diseases. Celladon's lead product candidate targets SERCA2a, an enzyme that becomes deficient in patients with heart failure.

Liquidity

As of December 31, 2012 and June 30, 2013, the Company has devoted substantially all of its efforts to product development, raising capital and building infrastructure and has not generated revenues from its planned principal operations. Accordingly, the Company is considered to be in the development stage.

The Company has a limited operating history and the revenue and income potential of the Company's business and market are unproven. The Company has experienced net losses and negative cash flows from operating activities since its inception, and as of December 31, 2012 and June 30, 2013, had a deficit accumulated during the development stage of $92.6 million and $101.0 million, respectively. Due to the Company's continuing research and development activities, the Company expects to continue to incur net losses into the foreseeable future. Successful transition to attaining profitable operations is dependent upon achieving a level of revenues adequate to support the Company's cost structure.

The Company plans to continue to fund its losses from operations and capital funding needs through future debt and equity financing. If the Company is not able to secure adequate additional funding, the Company may be forced to make reductions in spending, extend payment terms with suppliers, liquidate assets where possible, and/or suspend or curtail planned programs. Any of these actions could materially harm the Company's business, results of operations, and future prospects.

Use of Estimates

The Company's consolidated financial statements are prepared in accordance with U.S. generally accepted accounting principles (GAAP). The preparation of the Company's consolidated financial statements requires it to make estimates and assumptions that impact the reported amounts of assets, liabilities and expenses and the disclosure of contingent assets and liabilities in the Company's consolidated financial statements and accompanying notes. The most significant estimates in the Company's consolidated financial statements relate to the fair value of equity awards, the fair value of the redeemable non-controlling interest, and clinical trial expense accruals. Although these estimates are based on the Company's knowledge of current events and actions it may undertake in the future, actual results may ultimately materially differ from these estimates and assumptions.

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Reverse Stock Split

In January 2012, the Company filed an amended and restated certificate of incorporation under which each share of the Company's common stock was reverse split on a 1-for-100 basis. The accompanying consolidated financial statements and notes to the consolidated financial statements give retroactive effect to the reverse split for all periods presented.

Principles of Consolidation

On April 27, 2012, Celladon formed a subsidiary, Celladon Europe B.V. (Celladon EU), a Dutch limited liability company, for the purpose of managing the new capital investment made by Cooperatief LSP IV U.A. (LSP) related to Celladon's Series A-1 preferred stock (see Note 2). From its inception to June 6, 2013 the subsidiary was 90% owned by Celladon and subsequent to June 6, 2013 the subsidiary is wholly-owned by Celladon. The financial statements of Celladon EU are consolidated with those of the Company. All intercompany transactions and balances are eliminated in consolidation. The U.S. dollar is the functional currency of Celladon EU. The Company remeasures Celladon EU's assets and liabilities related to monetary assets and liabilities to the U.S. dollar and records the net gains or losses resulting from remeasurement in other income (expense) in the consolidated statements of operations and comprehensive loss. During the year ended December 31, 2012 and the six months ended June 30, 2012 and 2013, the Company did not record any material gains or losses from remeasurement.

Unaudited Interim Financial Information

The accompanying interim consolidated balance sheet as of June 30, 2013 and the consolidated statements of operations and comprehensive loss and cash flows for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013 and the consolidated statements of preferred stock and stockholders' deficit for the six months ended June 30, 2013 and the related footnote disclosures are unaudited. These unaudited interim financial statements have been prepared in accordance with GAAP. In management's opinion, the unaudited interim financial statements have been prepared on the same basis as the audited financial statements and include all adjustments, which include only normal recurring adjustments, necessary for the fair presentation of the Company's financial position as of June 30, 2013 and its results of operations and comprehensive loss and its cash flows for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013. The results for the six months ended June 30, 2013 are not necessarily indicative of the results expected for the full fiscal year or any other interim period.

Unaudited Pro Forma Balance Sheet Information

The unaudited pro forma balance sheet information as of June 30, 2013 assumes the conversion of all outstanding shares of preferred stock into 139,278,610 shares of the Company's common stock, resulting in the reclassification of the carrying value of the preferred stock to stockholders' deficit upon the completion of the initial public offering (IPO) contemplated by this prospectus. Shares of common stock issued in such IPO and any related net proceeds are excluded from the pro forma information.

Segment Reporting

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker in making decisions regarding resource allocation and assessing performance. The Company views its operations and manages its business in one operating segment.

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Fair Value of Financial Instruments

The Company's financial instruments primarily consist of cash and cash equivalents, investment securities, accounts payable and accrued liabilities. The carrying value of these financial instruments generally approximates fair value due to their short-term nature. Investment securities are recorded at fair value.

Cash and Cash Equivalents

Cash and cash equivalents consists primarily of readily available checking, money market accounts and money market funds. The Company considers all highly liquid investments with an original maturity of three months or less at the date of purchase to be cash equivalents.

Investment Securities

Investment securities primarily consist of investment grade corporate debt securities. The Company classifies all investment securities as available-for-sale. Investments with maturity dates greater than 12 months from the end of each reporting period are classified as long-term. Investment securities are carried at fair value, with the unrealized gains and losses reported as a component of other comprehensive income (loss) in stockholders' equity (deficit) until realized. Realized gains and losses from the sale of investment securities, if any, are determined on a specific identification basis. A decline in the market value of any investment security below cost that is determined to be other than temporary will result in an impairment charge to earnings and a new cost basis for the security is established. No such impairment charges were recorded for any period presented. As of December 31, 2012 and June 30, 2013, none of the investment securities have been in an unrealized loss position for more than 12 months. Premiums and discounts are amortized or accreted over the life of the related security as an adjustment to yield using the straight-line method and are included in interest income. Interest income is recognized when earned.

The following table sets forth the composition of the Company's investment securities (in thousands):

As of June 30, 2013	Maturity in Years	Amortized Cost	Unrealized		Fair Value
			Gains	Losses	
Corporate debt securities	Less than 1 year	$ 19,656	$ 8	$ (6)	$ 19,658

As of December 31, 2012	Maturity in Years	Amortized Cost	Unrealized		Fair Value
			Gains	Losses	
Corporate debt securities	Less than 1 year	$ 18,798	$ 12	$ (2)	$ 18,808
Corporate debt securities	Greater than 1 year	$ 2,863	$ –	$ (1)	$ 2,862

Concentration of Credit Risk

Financial instruments, which potentially subject the Company to significant concentration of credit risk, consist primarily of cash, cash equivalents and investment securities. The Company has established guidelines regarding diversification of investments and their maturities, which are designed to maintain principal and maximize liquidity. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. The Company has not experienced any losses in such accounts and management believes

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that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held.

Property and Equipment

Property and equipment are recorded at cost and depreciated using the straight-line method over the estimated useful lives of the assets (generally three to five years) and generally consist of furniture and fixtures, computers, and office equipment. Repairs and maintenance costs are charged to expense as incurred.

Impairment of Long-Lived Assets

Long-lived assets consist primarily of property and equipment. An impairment loss is recorded if and when events and circumstances indicate that assets might be impaired and the undiscounted cash flows estimated to be generated by those assets are less than the carrying amount of those assets. While the Company's current and historical operating losses and negative cash flows are indicators of impairment, management believes that future cash flows to be received support the carrying value of its long-lived assets and, accordingly, has not recognized any impairment losses since inception.

Clinical Trial Accruals

As part of the process of preparing its financial statements, the Company is required to estimate its expenses resulting from its obligations under contracts with vendors and consultants and clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided to us under such contracts. The Company's objective is to reflect the appropriate trial expenses in its financial statements by matching those expenses with the period in which services and efforts are expended. The Company accounts for these expenses according to the progress of the trial as measured by patient progression and the timing of various aspects of the trial. The Company determines accrual estimates through financial models taking into account discussion with applicable personnel and outside service providers as to the progress or state of consummation of trials, or the services completed. During the course of a clinical trial, the Company adjusts its rate of clinical expense recognition if actual results differ from its estimates. The Company makes estimates of its accrued expenses as of each balance sheet date in its financial statements based on the facts and circumstances known at that time. Although the Company does not expect its estimates to be materially different from amounts actually incurred, its understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in us reporting amounts that are too high or too low for any particular period. Through June 30, 2013, there have been no material adjustments to the Company's prior period estimates of accrued expenses for clinical trials. The Company's clinical trial accrual is dependent upon the timely and accurate reporting of contract research organizations and other third-party vendors.

Deferred Rent

Deferred rent consists of the difference between cash payments and the recognition of rent expense on a straight-line basis for the facility the Company occupies. The Company's lease for its facility provides for fixed increases in minimum annual rental payments. The total amount of rental payments due over the lease term is being charged to rent expense ratably over the life of the lease.

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Preferred Stock

The Company classifies preferred stock that is redeemable outside of the Company's control outside of permanent equity. For preferred stock that is contractually redeemable outside of the Company's control, the carrying value was increased to its redemption value by accretion in the period of issuance. In the absence of retained earnings, these accretion charges were recorded against additional paid-in capital.

Research and Development Costs

All research and development costs are expensed as incurred.

Patent Costs

Costs related to filing and pursuing patent applications are recorded as general and administrative expense and expensed as incurred since recoverability of such expenditures is uncertain.

Stock-Based Compensation

Stock-based compensation expense represents the cost of the grant date fair value of employee stock option grants recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures. The Company estimates the fair value of stock option grants using the Black-Scholes option pricing model.

The Company accounts for stock options granted to non-employees using the fair value approach. These option grants are subject to periodic revaluation over their vesting terms.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

The Company recognizes net deferred tax assets to the extent that management believes these assets are more likely than not to be realized. In making such a determination, management considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If management determines that the Company would be able to realize its deferred tax assets in the future in excess of their net recorded amount, management would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes.

The Company records uncertain tax positions on the basis of a two-step process whereby (1) management determines whether it is more likely than not that the tax positions will be sustained on the basis of the technical merits of the position and (2) for those tax positions that meet the more-likely-than-not recognition threshold, management recognizes the largest amount of tax benefit that is more than 50% likely to be realized upon ultimate settlement with the related tax authority. The Company recognizes interest and penalties related to unrecognized tax benefits within income tax expense. Any accrued interest and penalties are included within the related tax liability.

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Comprehensive Loss

Comprehensive loss is defined as a change in equity during a period from transactions and other events and circumstances from non-owner sources. The Company's only component of other comprehensive loss is unrealized gains (losses) on investment securities. Comprehensive loss has been reflected in the consolidated statements of operations and comprehensive loss and as a separate component of the statements of stockholders' deficit for all periods presented.

Net Loss Per Share Attributable to Common Stockholders

Basic net loss per share attributable to common stockholders is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of common shares outstanding for the period, without consideration for common stock equivalents. Diluted net loss per share attributable to common stockholders is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common share equivalents outstanding for the period determined using the treasury-stock method. Dilutive common stock equivalents are comprised of convertible preferred stock and rights to acquire convertible preferred stock (non-controlling interest), warrants for the purchase of common stock and options outstanding under the Company's stock option plans. For all periods presented, there is no difference in the number of shares used to calculate basic and diluted shares outstanding due to the Company's net loss position.

Potentially dilutive securities not included in the calculation of diluted net loss per share attributable to common stockholders because to do so would be anti-dilutive are as follows (in common stock equivalent shares):

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Six Months Ended June 30, 2012	Six Months Ended June 30, 2013
Redeemable convertible preferred stock	–	–	116,424,125	116,424,125	127,140,530
Convertible preferred stock	39,186,087	39,186,087	12,138,080	12,138,080	12,138,080
Warrants for common stock	8,777	8,777	8,777	8,777	8,777
Redeemable non-controlling interest	–	–	10,716,405	10,716,405	–
Common stock options	76,917	76,917	16,107,973	15,568,073	16,975,497
	39,271,781	39,271,781	155,395,360	154,855,460	156,262,884

Unaudited Pro Forma Net Loss Per Share

The following table summarizes the unaudited pro forma net loss per share (in thousands, except share and per share data):

	Year Ended December 31, 2012	Six Months Ended June 30, 2013
Numerator		
Net loss attributable to common stockholders	$(16,214)	$(11,468)
Net loss attributable to non-controlling interest	(154)	(96)
Accretion to redemption value of redeemable convertible preferred stock	343	–
Change in fair value of redeemable non-controlling interest	154	3,105
Pro forma net loss	$(15,871)	$ (8,459)

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(Information as of June 30, 2013 and thereafter and for the six months ended June 30, 2012 and 2013 and the period from December 21, 2000 (inception) to June 30, 2013 is unaudited)

	Year Ended December 31, 2012	Six Months Ended June 30, 2013
Denominator		
Weighted-average shares outstanding, basic and diluted	10,261,532	11,043,541
Pro forma adjustments to reflect assumed weighted-average effect of conversion of convertible preferred stock	88,739,965	130,042,371
Pro forma adjustments to reflect assumed weighted-average effect of exchange of exchangeable shares	8,051,944	9,236,239
Pro forma weighted-average shares outstanding, basic and diluted	107,053,441	150,322,151
Pro forma net loss per share attributable to common stockholders, basic and diluted	$ (0.15)	$ (0.06)

Recent Accounting Pronouncements

In February 2013, the Financial Accounting Standards Board (FASB), issued guidance to provide information about the amounts reclassified out of accumulated other comprehensive income (AOCI), by component. An entity is required to present, either on the face of the consolidated financial statements or in the notes, significant amounts reclassified out of AOCI by the respective line items of net income, but only if the amount reclassified is required to be reclassified in its entirety in the same reporting period. For amounts that are not required to be reclassified in their entirety to net income, an entity is required to cross-reference to other disclosures that provide additional details about those amounts. On January 1, 2013, the Company adopted this standard, which had no impact on its financial position or results of operations.

2. Celladon Europe B.V.

In April 2012 and June 2012, LSP invested an aggregate of $4.8 million in Celladon EU. In exchange for the investment, the Company issued LSP one share of Special Preferred Voting stock and Celladon EU issued LSP 1,999 non-voting B shares. The 1,999 B shares were exchangeable into 10,716,405 shares of the Company's Series A-1 preferred stock at the option of LSP. The Company determined that the investment held by LSP in Celladon EU should be classified as a redeemable non-controlling interest, as the shares of Celladon EU were not in-substance common stock. In-substance common stock is an investment in an entity that has risk and reward characteristics that are substantially similar to that entity's common stock. Due to the liability characteristics associated with the shares of Celladon EU held by LSP, the Company concluded that the investor's shares were not substantially similar to common stock. The liability characteristics include the investor's put rights, which provide the investor with the ability to exchange its shares in Celladon EU for Series A-1 preferred stock of the Company.

The redeemable non-controlling interest was initially valued using the fair value of the Series A-1 preferred stock. At each reporting period, the Company adjusts the carrying value of the redeemable non-controlling interest by the net loss attributable to the redeemable non-controlling interest. Any difference between the fair value and the adjusted carrying value of the redeemable non-controlling interest is recorded as an adjustment to additional paid-in capital and presented as a component of net loss attributable to common stockholders in the accompanying consolidated statements of operations and comprehensive loss.

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On June 6, 2013, LSP delivered a notice to exchange its 1,999 B shares of Celladon EU for 10,716,405 shares of the Company's Series A-1 preferred stock. Concurrently, the one share of outstanding Special Preferred Voting stock was cancelled. As of June 6, 2013, the redeemable non-controlling interest was adjusted to fair value and reclassified to Series A-1 preferred stock on the accompanying consolidated balance sheet.

From April 2012 through June 6, 2013, LSP owned approximately 10% of Celladon EU.

During the year ended December 31, 2012 and the six months ended June 30, 2012 and 2013, the Company adjusted the loss attributable to common stockholders as a result of increases in the fair value of the redeemable non-controlling interest of approximately $0.2 million, $0.1 million, and $3.1 million, respectively. The increases in fair value increased the loss attributable to common stockholders.

As of December 31, 2012 and June 30, 2013, the $0.3 million and $0.7 million, respectively, of liabilities recognized as a result of consolidating Celladon EU do not represent additional claims on the Company's general assets; rather, they represent claims against the specific assets of Celladon EU. As of December 31, 2012 and June 30, 2013, the $3.6 million and $2.5 million, respectively, of assets recognized as a result of consolidating Celladon EU do not represent additional assets that could be used to satisfy claims against the Company's general assets. The assets of Celladon EU represent the only significant assets of the Company not located in the United States.

3. Balance Sheet Details

Property and equipment consist of the following (in thousands):

	As of December 31,		As of June 30,
	2011	2012	2013
Office furniture and equipment	$ 360	$ 332	$ 326
Accumulated depreciation	(222)	(210)	(229)
	$ 138	$ 122	$ 97

Accounts payable and accrued expenses consist of the following (in thousands):

	As of December 31,		As of June 30,
	2011	2012	2013
Accounts payable	$ 553	$ 569	$ 699
Current portion of deferred rent	–	–	6
Accrued compensation	244	460	329
Accrued other	93	105	135
	$ 890	$ 1,134	$ 1,169

4. Fair Value Measurements

The Company's financial instruments primarily consist of cash and cash equivalents, investment securities, accounts payable and accrued liabilities. The carrying value of these financial instruments generally approximates fair value due to their short-term nature. Investment securities are recorded at fair value.

The accounting guidance defines fair value, establishes a consistent framework for measuring fair value and expands disclosure for each major asset and liability category measured at fair value on either a recurring or
nonrecurring basis. Fair value is defined as an exit price, representing the amount that would be received to sell

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an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, the accounting guidance establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value as follows:

Level 1: Observable inputs such as quoted prices in active markets;

Level 2: Inputs, other than the quoted prices in active markets, that are observable either directly or indirectly; and

Level 3: Unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions

As of December 31, 2011 and 2012 and June 30, 2013, cash and cash equivalents consist primarily of bank deposits with third-party financial institutions and highly liquid money market securities with original maturities at date of purchase of 90 days or less and are stated at cost which approximate fair value and are classified within the Level 1 designation discussed above. Marketable securities are recorded at fair value, defined as the exit price in the principal market in which the Company would transact, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. Level 2 securities are valued using quoted market prices for similar instruments, non-binding market prices that are corroborated by observable market data, or discounted cash flow techniques and include the Company's investments in corporate debt securities and commercial paper. Financial assets and liabilities that are measured or disclosed at fair value on a recurring basis, and are classified within the Level 3 designation, include the redeemable non-controlling interest. None of the Company's non-financial assets and liabilities are recorded at fair value on a non-recurring basis. No transfers between levels have occurred during the periods presented.

Cash equivalents measured at fair value as of December 31, 2011 and 2012 and June 30, 2013, are all classified within Level 1. Below is a summary of assets and liabilities measured at fair value (in thousands):

		Fair Value Measurements at Reporting Date Using		
	As of June 30, 2013	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Corporate debt securities	$ 19,658	$ –	$ 19,658	$ –

		Fair Value Measurements at Reporting Date Using		
	As of December 31, 2012	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Corporate debt securities	$ 21,670	$ –	$ 21,670	$ –
Liabilities:				
Redeemable non-controlling interest	$ 4,814	$ –	$ –	$ 4,814

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The following table provides a reconciliation of all liabilities measured at fair value using Level 3 significant unobservable inputs (in thousands):

	Redeemable Non-Controlling Interest
Balance at December 31, 2011	$ –
Issuance of shares of redeemable non-controlling interest	4,814
Net loss attributable to redeemable non-controlling interest	(154)
Change in fair value	154
Balance at December 31, 2012	4,814
Net loss attributable to redeemable non-controlling interest	(96)
Changes in fair value	3,105
Exchange of redeemable non-controlling interest for Series A-1 preferred stock	(7,823)
Balance at June 30, 2013	$ –

The fair value per share of the Company's underlying Series A-1 preferred stock was used to determine the fair value of the redeemable non-controlling interest. As of December 31, 2012 and June 30, 2013, the fair value of the Series A-1 preferred stock was $0.449 and $0.73, respectively. The fair value was determined using either an option pricing model or a hybrid option pricing and probability weighted expected return model. The key inputs into the models included the probability and timing of expected liquidity event dates, discount rates and the selection of appropriate market comparable transactions and multiples to apply to the Company's various historical and forecasted operational metrics.

5. Commitments and Contingencies

Sublicense Agreement and Amended and Restated License Agreement with AmpliPhi

Sublicense Agreement

In June 2012, the Company entered into a sublicense agreement (the AmpliPhi Sublicense) with AmpliPhi Biosciences Corporation (AmpliPhi), pursuant to which AmpliPhi sublicensed to the Company certain rights under a separate agreement which AmpliPhi entered into in 2009 with the Trustees of University of Pennsylvania (UPenn). Under the terms of the AmpliPhi Sublicense, the Company obtained an exclusive, worldwide sublicense from AmpliPhi under certain UPenn patents related to AAV1 vectors for the development, manufacture, use and sale of companion diagnostics to MYDICAR. In addition, the Company is required to use commercially reasonable efforts to meet certain developmental, regulatory and commercial milestones with respect to companion diagnostics under the agreement. The Company is currently in compliance with these milestone requirements. In consideration for the sublicense granted to the Company under the agreement, the Company paid to AmpliPhi a sublicense initiation fee of $310,000, and the Company is obligated to pay to AmpliPhi an annual sublicense maintenance fee of $310,000. The Company is also required to pay to AmpliPhi a low single-digit percentage royalty based on net sales of any companion diagnostic covered by a licensed patent sold by the Company, its affiliates or its sublicensees. The Company's royalty obligations continue on a companion diagnostic-by-companion diagnostic and country-by-country basis until the expiration of the last-to-expire valid claim in a licensed patent covering the applicable companion diagnostic in such country. Finally, the Company is obligated to pay to AmpliPhi all royalty and milestone payments that become due and payable by AmpliPhi to UPenn under AmpliPhi's agreement with UPenn as a result of the Company's exercise of the

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sublicense granted under the Company's agreement with AmpliPhi, including a low single-digit tiered percentage royalty on net sales of any companion diagnostic sold by the Company, its affiliates or its sublicensees and up to an aggregate of $850,000 in potential milestone payments per product covered by the licensed patents.

The Company may unilaterally terminate the agreement upon 30 days' written notice to AmpliPhi. Absent early termination, the agreement will automatically terminate upon the expiration of the last-to-expire licensed patent, which is expected to be in 2019.

Amended and Restated License Agreement

The Company entered into an amended and restated license agreement with AmpliPhi concurrently with the AmpliPhi Sublicense that both amended the terms of the license agreement which the Company entered into with AmpliPhi in 2009 and terminated its manufacturing agreement with AmpliPhi which the Company entered into in 2009. Under the agreement, the Company obtained an exclusive, worldwide license under certain patents and know-how related to AmpliPhi's AAV vector and manufacturing technology for the development, manufacture, use and sale of MYDICAR. In addition, the Company has agreed to use commercially reasonable efforts to meet certain diligence milestones with respect to the development and commercialization of at least one product covered by the UPenn patent rights licensed to AmpliPhi by UPenn under the Company's agreement with UPenn. The Company is currently in compliance with these milestone requirements. During the term of the agreement, the Company is obligated to pay to AmpliPhi all royalty and milestone payments that become due and payable by AmpliPhi to UPenn under AmpliPhi's agreement with UPenn as a result of the Company's exercise of the sublicense granted under the Company's agreement with AmpliPhi. This includes a low single-digit tiered percentage royalty on net sales of MYDICAR and any other product covered by the licensed patents sold by the Company, its affiliates or its sublicensees, and up to $850,000 in milestone payments upon the achievement of certain developmental and regulatory milestones related to MYDICAR and any other product covered by the licensed patents. The agreement does not provide either party with termination rights and does not have a provision for expiration or automatic termination. In addition, the Company paid $3.2 million in exchange for certain intangible assets associated with the license agreement that the Company acquired from AmpliPhi in June 2012, which were expensed as in-process research and development during the year ended December 31, 2012.

Exclusive Patent License with the Regents of the University of Minnesota

In May 2009, the Company entered into an exclusive patent license agreement with the Regents of the University of Minnesota (UMinn) under which it obtained an exclusive license to UMinn's joint ownership interest in a patent application related to screening technology for isolation of small molecule modulators of SERCA enzymes.

The Company has agreed to meet certain performance milestones under the agreement, the deadline for which may be extended at the Company's request provided that the Company has used commercially reasonable efforts to achieve such milestones by the applicable deadlines. The Company is currently in compliance with these milestone requirements. The Company has the first right to prosecute and maintain the applicable patent family.

The Company made an upfront payment to UMinn of $120,000. In addition, the Company is obligated to pay to UMinn an annual license fee of $120,000. The annual license fee will increase to $325,000 if the Company (1) undergoes a change of control, (2) assigns the agreement, any of its rights or obligations under the

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agreement or as joint ownership interest in the licensed technology, (3) receives a certain amount in license and sublicense revenues under the agreement, (4) files an investigational new drug application, or IND, new drug application, biologic license application or orphan drug application (or a foreign equivalent of any such application) for a product covered by the licensed technology, or (5) enters into any agreement with a third party to market or use the licensed technology, subject to certain exceptions.

The Company may unilaterally terminate the agreement upon 90 days' written notice to UMinn. UMinn may terminate the agreement upon 10 days' written notice to the Company upon the Company's insolvency or for its breach of the agreement if such breach remains uncured for 90 days after the Company receives notice of such breach, or 30 days in the case of a non-payment breach. Absent early termination, the agreement will automatically terminate upon the expiration of all active claims in any licensed patent or patent application.

Other License Agreements

The Company has entered into various license agreements pursuant to which the Company acquired certain intellectual property. Pursuant to each agreement the Company paid a license fee and reimbursed historical patent costs. Additionally, under each agreement, the Company may be required to pay annual maintenance fees, royalties, milestone payments and sublicensing fees. Each of the license agreements is generally cancelable by the Company, given appropriate prior written notice. Minimum annual payments to maintain these cancelable licenses total an aggregate of approximately $0.1 million and potential future milestone payments total an aggregate of approximately $2.2 million.

Leases

The Company maintains an office facility in San Diego, California. On March 6, 2012, the Company entered into a long-term operating lease that expires in November 2017. During 2011, the Company was under a month-to-month lease. Rent expense was $0.1 million, $28,000, $0.1 million, and $0.5 million for the year ended December 31, 2012, the six months ended December 31, 2011, the year ended June 30, 2011, and the period from December 21, 2000 (inception) to December 31, 2012, respectively. In addition, rent expense was $33,000 and $42,000 for the six months ended June 30, 2012 and 2013, respectively.

The future minimum annual rental commitments under the lease obligations are as follows (in thousands):

	Lease Obligations
Year ending December 31:	
2013	$ 67
2014	92
2015	95
2016	97
2017	83
Thereafter	–
Total	$ 434

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6. Preferred Stock and Stockholders' Equity (Deficit)

The authorized, issued and outstanding shares of preferred stock by series are as follows (in thousands, except share amounts):

As of June 30, 2013	Shares Authorized	Shares Outstanding	Liquidation Preference	Redemption Amount
Redeemable convertible preferred stock:				
Series A-1	131,594,871	127,140,530	$ 114,172	$ 57,086
Convertible preferred stock:				
Junior preferred stock	12,138,080	12,138,080	5,450	–
Total	143,732,951	139,278,610	$ 119,622	$ 57,086

As of December 31, 2012	Shares Authorized	Shares Outstanding	Liquidation Preference	Redemption Amount
Redeemable convertible preferred stock:				
Series A-1	131,594,871	116,424,125	$ 104,549	$ 52,274
Convertible preferred stock:				
Junior preferred stock	12,138,080	12,138,080	5,450	–
Special voting preferred	1	1	–	–
Total	143,732,952	128,562,206	$ 109,999	$ 52,274

Description of Securities

Dividends

Each holder of preferred stock is entitled to non-cumulative dividends at an annual rate of 8.0% of the original issue price when and if declared by the board of directors. Dividends are paid with the following preference: (i) Series A-1 preferred stock, (ii) Junior preferred stock and, finally, (iii) common stock. If dividends are paid to the holders of common stock, the holders of Series A-1 preferred stock will participate as if they had converted to common stock. As of June 30, 2013, the board of directors of the Company has not declared any dividends.

Liquidation Preferences

Liquidation amounts are paid with the same preference as the dividends above. Once all series of preferred stock have been paid the liquidation preference, plus declared but unpaid dividends, all remaining assets of the Company would be distributed to holders of common stock and Series A-1 preferred stock as if they had converted to common stock.

Conversion

Each holder of preferred stock has the right, at the option of the holder, to convert shares of preferred stock into shares of common stock at a ratio of one-to-one. Each share of preferred stock will convert into shares of common stock, at the then-effective applicable conversion rate, upon such time as: (i) may be designated by the holders of at least 60% of the Series A-1 preferred stock, voting as a separate class on an as-if-converted to common stock basis;

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or (ii) is immediately prior to the closing of a firmly underwritten public offering in which the Company receives gross proceeds (after deduction of underwriting commissions and expenses) of at least $50 million and the offering price per share is not less than $1.347.

Voting

The holder of each share of preferred stock is entitled to one vote for each share of common stock into which it would convert.

Redemption Requirements

The Series A-1 preferred stock is redeemable upon the consent of at least 60% of the then-outstanding shares of Series A-1 preferred stock on or after January 27, 2017. The redemptions shall occur in three annual installments, with the first redemption occurring within 60 days of written notice.

Preferred Stock and Related Transactions

Beginning in September 2004 through September 2009, the Company issued 43,262,477 shares of preferred stock for aggregate gross proceeds of $61.1 million. The Company incurred offering costs of $0.4 million, receiving net proceeds of $60.7 million. In fiscal 2006, 4,000,068 shares of preferred stock were converted into common stock due to the nonparticipation of certain preferred stockholders in a preferred stock financing. In fiscal 2009, an additional 75,602 shares of preferred stock were cancelled. In connection with the Company's reincorporation in Delaware in April 2012, the 39,186,807 remaining outstanding shares of preferred stock were converted into common stock on a basis of one share of common stock for each 100 shares of preferred stock.

Beginning in December 2009 through December 2011, the Company issued $10.0 million and $2.4 million in non-secured and secured convertible promissory notes, respectively, to its Series C convertible preferred stockholders. The notes accrued interest at 12% annually. On January 27, 2012, the Company closed its Series A-1 preferred stock and Junior preferred stock financing. The financing included the conversion of the outstanding convertible notes to Series A-1 preferred stock and Junior preferred stock and conversion of approximately $2.2 million of accrued interest to common stock.

In January 2012, the Company issued 27,616,923 shares of Series A-1 preferred stock and 12,138,080 of Junior preferred stock under the initial closing of a Series A-1 and Junior preferred stock purchase agreement at a price of $0.449 per share for net proceeds of $17.8 million, which included the conversion of $12.2 million in outstanding convertible debt and $2.2 million of accrued interest.

In March 2012 and June 2012, the Company issued 1,913,987 and 86,893,215 shares of Series A-1 preferred stock for gross proceeds of $0.9 million and $39.1 million, respectively.

Common Warrants

The following table summarizes the fully exercisable warrants outstanding for the purchase of common stock as of December 31, 2012 and June 30, 2013:

Share Issuable Upon Exercise	Exercise Price	Expiration Date
1,000	$ 18.00	January 2015
7,777	$ 1.00	October 2016
8,777		

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Stock Options

In December 2001, the Company adopted its 2001 Stock Option Plan (the 2001 Plan) and in January 2012 adopted its 2012 Equity Incentive Plan (the 2012 Plan, and collectively the Plans). The 2001 Plan has no remaining shares available for future grant. The 2012 Plan (as amended April 2012) provides for the grant of up to 18,589,734 incentive stock options, non-statutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, and other stock awards to eligible recipients. Options granted under the Plans generally expire no more than ten years from the date of grant and generally vest and become exercisable over a period not to exceed four years, as determined by the board of directors. Recipients of stock options are eligible to purchase shares of the Company's common stock at an exercise price equal to no less than the estimated fair market value of such stock on the date of grant.

A summary of the Company's stock option activity under the Plans is as follows:

	Shares	Weighted-Average Exercise Price
Outstanding at June 30, 2010	85,123	$ 19.00
Granted	300	17.00
Exercised	(6,121)	15.00
Canceled	(2,385)	16.00
Outstanding at June 30, 2011 and December 31, 2011	76,917	20.00
Granted	16,031,056	0.09
Outstanding at December 31, 2012	16,107,973	0.18
Granted	870,000	0.09
Canceled	(2,476)	14.54
Outstanding at June 30, 2013	16,975,497	0.18

Information about the Company's outstanding stock options is as follows (in thousands, except share and per share data):

	Number of Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
June 30, 2013:				
Options outstanding	16,975,497	$ 0.18	8.99	$ 8,113
Options vested and expected to vest	16,655,497	$ 0.18	8.98	$ 7,959
Options exercisable	16,975,497	$ 0.18	8.99	$ 8,113
December 31, 2012:				
Options outstanding	16,107,973	$ 0.18	9.45	$ –
Options vested and expected to vest	16,107,973	$ 0.18	9.45	$ –
Options exercisable	16,107,973	$ 0.18	9.45	$ –

The weighted-average grant date fair value of employee option grants during the year ended December 31, 2012 and the six months ended June 30, 2012 and 2013 was $0.06 per share.

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Stock-Based Compensation Expense

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of the employee stock option grants were as follows:

	Year Ended December 31, 2012	Six Months Ended June 30,	
		2012	2013
Risk-free interest rate	2.29%	2.28%	1.06%
Expected volatility	84%	84%	84%
Expected term (in years)	5.9	5.9	6.1
Expected dividend yield	0.0%	0.0%	0.0%

Risk-free interest rate. The Company bases the risk-free interest rate assumption on observed interest rates appropriate for the expected term of the stock option grants.

Expected volatility. The expected volatility assumption is based on volatilities of a peer group of similar companies whose share prices are publicly available. The peer group was developed based on companies in the biotechnology industry.

Expected term. The expected term represents the period of time that options are expected to be outstanding. Because the Company does not have historical exercise behavior, it determines the expected life assumption using the simplified method, which is an average of the contractual term of the option and its vesting period.

Expected dividend yield. The Company bases the expected dividend yield assumption on the fact that it has never paid cash dividends and has no present intention to pay cash dividends.

The allocation of stock-based compensation for all equity awards is as follows (in thousands):

	Year Ended June 30, 2011	Six Months Ended December 31, 2011	Year Ended December 31, 2012	Six Months Ended June 30,	
				2012	2013
Research and development	$ 159	$ 63	$ 222	$ 97	$ 228
General and administrative	58	19	76	34	38
	$ 217	$ 82	$ 298	$ 131	$ 266

As of December 31, 2012 and June 30, 2013, the unrecognized compensation cost related to outstanding employee options, was $0.6 million and $0.5 million, respectively, and is expected to be recognized as expense over approximately 3.0 years and 3.0 years, respectively.

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Common Stock Reserved for Future Issuance

Common stock reserved for future issuance is as follows:

	December 31, 2012	June 30, 2013
Granted and outstanding under the Plans	16,107,973	16,975,497
Available for grant under the 2012 Plan	2,558,678	1,688,678
Warrants issued and outstanding	8,777	8,777
Rights to acquire convertible preferred stock (non-controlling interest)	10,716,405	–
Convertible preferred stock	128,562,205	139,278,610
	157,954,038	157,951,562

7. Income Taxes

Significant components of the Company's deferred tax assets are summarized as follows (in thousands):

	December 31,	
	2011	2012
Deferred tax assets:		
Capitalized R&D	$ 4,006	$ 7,671
Other	361	324
Deferred tax assets	4,367	7,995
Valuation allowance	(4,367)	(7,995)
Net deferred tax assets	$ –	$ –

A valuation allowance of $4.4 million and $7.9 million at December 31, 2011 and 2012, respectively, has been established to offset the deferred tax assets, as realization of such assets is uncertain.

At December 31, 2012, the Company had federal and California net operating loss (NOL) carryforwards of approximately $67.9 million and $69.4 million, respectively, which may be available to offset future taxable income, subject to Section 382 of the Internal Revenue Code of 1986, as amended (the Code), as well as similar state and foreign provisions discussed below. The federal and California NOL carryforwards begin to expire in 2021 and 2018, respectively, unless previously utilized. At December 31, 2012, the Company had federal and California research and development (R&D) credit carryforwards of approximately $2.9 million and $0.9 million, respectively. The federal R&D tax credit carryforwards will begin to expire in 2024 unless previously utilized. The California R&D credit carryforwards will carry forward indefinitely.

Utilization of the NOL and R&D credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that may have occurred or that could occur in the future, as required by Section 382 of the Internal Revenue Code of 1986, as amended (the Code), as well as similar state and foreign provisions. These ownership changes may limit the amount of NOL and R&D credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an "ownership change" as defined by Section 382 of the Code results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50 percentage points of the outstanding stock of a company by certain stockholders. Since the Company's formation, the Company has raised capital through the issuance of

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capital stock on several occasions, which on its own or combined with the purchasing stockholders' subsequent disposition of those shares, have resulted in an ownership change, and could result in an ownership change in the future.

The Company is currently in the process of completing a Section 382 study to determine the impact that ownership changes through December 31, 2012 have had on its carryforwards. Until this analysis has been completed, the Company has removed the deferred tax assets for net operating losses of approximately $27.1 million and research and development credits of approximately $2.7 million generated through 2012 from its deferred tax asset schedule, and has recorded a corresponding decrease to its valuation allowance. Based on the preliminary results of the study, the Company has estimated that federal and California NOLs of $30.6 million and $31.4 million are available and federal and California R&D credit carryforwards of zero and $0.9 million are available. When this analysis is finalized, the Company plans to update its unrecognized tax benefits accordingly. Due to the existence of the valuation allowance, future changes in the Company's unrecognized tax benefits will not impact the Company's effective tax rate. If the Company has experienced an ownership change at any time since its formation, utilization of the NOL or R&D credit carryforwards would be subject to an annual limitation
under Section 382 of the Code, which is determined by first multiplying the value of the Company's stock at the time of the ownership change by the applicable long-term, tax-exempt rate, and then could be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the NOL or R&D credit carryforwards before utilization. Further, until a study is completed and any limitation known, no amounts are being considered as an uncertain tax position or disclosed as an unrecognized tax benefit. Due to the existence of the valuation allowance, future changes in the Company's unrecognized tax benefits will not impact its effective tax rate. Any carryforwards that will expire prior to utilization as a result of such limitations will be removed from deferred tax assets, with a corresponding reduction of the valuation allowance.

The Company files income tax returns in the United States, California and the Netherlands. The Company currently has no years under examination by any jurisdiction. The tax years for 2001 and later are subject to examination by the federal and California tax authorities due to the carry forward of unutilized NOLs and R&D credits. The foreign income tax returns are open to examination for the year 2012.

The Company does not have any material unrecognized tax benefits and does not anticipate that the amount of unrecognized tax benefits as of December 31, 2012 will change within the next twelve months. The Company has not recognized interest and/or penalties in its consolidated statements of operations and comprehensive loss since inception.

8. Employee Benefits

All employees of the Company are eligible to participate in the 401(k) Plan. The 401(k) matching contributions, if any, are determined by the Company at its sole discretion. During the year ended June 30, 2011, the six months ended December 31, 2011, the year ended December 31, 2012 and the period from December 21, 2000 (inception) to December 31, 2012, the Company made matching contributions totaling $0.1 million, $20,000, $0.1 million and $0.3 million, respectively. In addition, the Company made matching contributions totaling $42,000 and $0.1 million for the six months ended June 30, 2012 and 2013, respectively.

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Shares

Common Stock

J.P. Morgan

Barclays

Stifel

Wedbush PacGrow Life Sciences

, 2013

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth all costs and expenses, other than underwriting discounts and commissions, payable by Celladon Corporation (the "Registrant") in connection with the sale of the common stock being registered. All amounts shown are estimates except for the Securities and Exchange Commission ("SEC") registration fee, the Financial Industry Regulatory Authority, Inc. ("FINRA") filing fee and the NASDAQ Global Market listing fee.

	Amount to be paid
SEC registration fee	$ *
FINRA filing fee	*
NASDAQ Global Market listing fee	125,000
Blue sky qualification fees and expenses	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent and registrar fees and expenses	*
Miscellaneous expenses	*
Total	$ *

* To be provided by amendment.

Item 14. Indemnification of Directors and Officers.

The Registrant is incorporated under the laws of the State of Delaware. Section 145 of the Delaware General Corporation Law provides that a Delaware corporation may indemnify any persons who were, are, or are threatened to be made, parties to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation), by reason of the fact that such person is or was an officer, director, employee or agent of such corporation, or is or was serving at the request of such corporation as an officer, director, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal. A Delaware corporation may indemnify any persons who were, are, or are threatened to be made, a party to any threatened, pending or completed action or suit by or in the right of the corporation by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit provided such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him or her against the expenses (including attorneys' fees) actually and reasonably incurred.

The Registrant's amended and restated certificate of incorporation and amended and restated bylaws, each of which will become effective upon the closing of this offering, provide for the indemnification of its directors and officers to the fullest extent permitted under the Delaware General Corporation Law.

Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duties as a director, except for liability for any:

- transaction from which the director derives an improper personal benefit;
- act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or redemption of shares; or
- breach of a director's duty of loyalty to the corporation or its stockholders.

The Registrant's amended and restated certificate of incorporation includes such a provision. Expenses incurred by any officer or director in defending any such action, suit or proceeding in advance of its final disposition shall be paid by the Registrant upon delivery to it of an undertaking, by or on behalf of such director or officer, to repay all amounts so advanced if it shall ultimately be determined that such director or officer is not entitled to be indemnified by the Registrant.

Section 174 of the Delaware General Corporation Law provides, among other things, that a director who willfully or negligently approves of an unlawful payment of dividends or an unlawful stock purchase or redemption, may be held liable for such actions. A director who was either absent when the unlawful actions were approved or dissented at the time may avoid liability by causing his or her dissent to such actions to be entered in the books containing minutes of the meetings of the board of directors at the time such action occurred or immediately after such absent director receives notice of the unlawful acts.

As permitted by the Delaware General Corporation Law, the Registrant has entered into indemnity agreements with each of its directors and executive officers, that require the Registrant to indemnify such persons against any and all costs and expenses (including attorneys', witness or other professional fees) actually and reasonably incurred by such persons in connection with any action, suit or proceeding (including derivative actions), whether actual or threatened, to which any such person may be made a party by reason of the fact that such person is or was a director or officer or is or was acting or serving as an officer, director, employee or agent of the Registrant or any of its affiliated enterprises. Under these agreements, the Registrant is not required to provided indemnification for certain matters, including:

- indemnification beyond that permitted by the Delaware General Corporation Law;
- indemnification for any proceeding with respect to the unlawful payment of remuneration to the director or officer;
- indemnification for certain proceedings involving a final judgment that the director or officer is required to disgorge profits from the purchase or sale of the Registrant's stock;
- indemnification for proceedings involving a final judgment that the director's or officer's conduct was in bad faith, knowingly fraudulent or deliberately dishonest or constituted willful misconduct or a breach of his or her duty of loyalty, but only to the extent of such specific determination;
- indemnification for proceedings or claims brought by an officer or director against us or any of the Registrant's directors, officers, employees or agents, except for (1) claims to establish a right of indemnification or proceedings, (2) claims approved by the Registrant's board of directors, (3) claims required by law, (4) when there has been a change of control as defined in the indemnification agreement with each director or officer, or (5) by the Registrant in its sole discretion pursuant to the powers vested to the Registrant under Delaware law;
- indemnification for settlements the director or officer enters into without the Registrant's consent; or
- indemnification in violation of any undertaking required by the Securities Act or in any registration statement filed by the Registrant.

The indemnification agreements also set forth certain procedures that will apply in the event of a claim for indemnification thereunder.

Except as otherwise disclosed under the heading “Legal Proceedings” in the “Business” section of the prospectus included in this registration statement, there is at present no pending litigation or proceeding involving any of the Registrant’s directors or executive officers as to which indemnification is required or permitted, and the Registrant is not aware of any threatened litigation or proceeding that may result in a claim for indemnification.

The Registrant has an insurance policy in place that covers its officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act of 1933, as amended (the “Securities Act”) or otherwise.

The Registrant plans to enter into an underwriting agreement which provides that the underwriters are obligated, under some circumstances, to indemnify the Registrant’s directors, officers and controlling persons against specified liabilities, including liabilities under the Securities Act.

Item 15. Recent Sales of Unregistered Securities.

The following sets forth information regarding all unregistered securities sold by the Registrant since January 1, 2010:

(1) From May 2010 to December 2011, the Registrant issued and sold to investors convertible promissory notes in the aggregate principal amount of $8.9 million, which notes bore interest at the rate of 12% per annum.

(2) In January 2012, the Registrant issued and sold to investors an aggregate of 27,616,923 shares of its Series A-1 Preferred Stock and 12,138,080 shares of its Junior preferred stock, at a purchase price of $0.449 per share, for aggregate consideration of $17.8 million. Of this amount, $12.4 million was paid for by cancellation of principal indebtedness under the promissory notes described in paragraph (1) above and the balance was paid for in cash.

(3) In January 2012, the Registrant issued an aggregate of 10,615,900 shares of its common stock to the holders of the convertible promissory notes described in paragraph (1) above in exchange for the waiver of such holders’ rights to receive payment of unpaid accrued interest under such notes.

(4) From March 2012 to June 2012, the Registrant issued and sold to investors an aggregate of 88,807,202 shares of its Series A-1 preferred stock, at a purchase price of $0.449 per share, for aggregate cash consideration of $39.9 million. In addition, from April 2012 to June 2012, the Registrant issued securities exchangeable for 10,716,405 shares of its Series A-1 preferred stock, at a purchase price of $0.449 per share on an as-exchanged basis, for aggregate cash consideration of $4.8 million.

(5) In June 2013, the Registrant issued 10,716,405 shares of its Series A-1 preferred stock to Coöperatief LSP IV UA in consideration for the exchange by Coöperatief LSP IV UA of share capital it held in the Registrant’s Netherlands-based subsidiary, Celladon Europe B.V. No additional consideration was provided for this issuance.

(6) From January 14, 2010 to June 10, 2010, the Registrant granted stock options under its 2001 Stock Option Plan to purchase an aggregate of 22,252 shares of common stock to its employees, directors and consultants, having exercise prices ranging from $18.00 to $28.00 per share. A total of 543 of these options were exercised and 106 of these options to purchase shares of common were cancelled through June 30, 2013. The foregoing share numbers and per share exercise prices reflect the effect of the 1-for-100 reverse split of the Registrant’s capital stock that occurred in January 2012.

(7) From June 15, 2012 to April 25, 2013, the Registrant granted stock options under its 2012 Equity Incentive Plan to purchase up to an aggregate of 16,901,056 shares of its common stock to its

employees, directors and consultants, at an exercise price of $0.09 per share. None of these options to purchase shares of common stock have been exercised through June 30, 2013.

The offers, sales and issuances of the securities described in paragraphs (1) through (5) above were deemed to be exempt from registration under the Securities Act in reliance on Section 4(2) of the Securities Act and Rule 506 promulgated under Regulation D promulgated thereunder as transactions by an issuer not involving a public offering. The recipients of securities in each of these transactions acquired the securities for investment only and not with a view to or for sale in connection with any distribution thereof and appropriate legends were affixed to the securities issued in these transactions. Each of the recipients of securities in these transactions was an accredited investor within the meaning of Rule 501 of Regulation D under the Securities Act and had adequate access, through employment, business or other relationships, to information about us. No underwriters were involved in these transactions.

The offers, sales and issuances of the securities described in paragraphs (6) and (7) above were deemed to be exempt from registration under the Securities Act in reliance on Rule 701 in that the transactions were under compensatory benefit plans and contracts relating to compensation as provided under Rule 701. The recipients of such securities were our employees, directors or bona fide consultants and received the securities under the Registrant's 2001 Stock Option Plan and/or the Registrant's 2012 Equity Incentive Plan. Appropriate legends were affixed to the securities issued in these transactions. Each of the recipients of securities in these transactions had adequate access, through employment, business or other relationships, to information about us.

Item 16. Exhibits and Financial Statement Schedules.

(a) Exhibits.

Exhibit Number	Description of Document
1.1†	Form of Underwriting Agreement.
3.1	Amended and Restated Certificate of Incorporation, as amended and as currently in effect.
3.2	Form of Amended and Restated Certificate of Incorporation to become effective upon closing of this offering.
3.3	Bylaws, as currently in effect.
3.4	Form of Amended and Restated Bylaws to become effective upon closing of this offering.
4.1†	Form of Common Stock Certificate of the Registrant.
4.2†	Amended and Restated Investor Rights Agreement by and among the Registrant and certain of its stockholders, to be effective upon closing of this offering.
5.1†	Opinion of Cooley LLP.
10.1+	Form of Indemnity Agreement by and between the Registrant and its directors and officers.
10.2+	Celladon Corporation 2001 Stock Option Plan and Form of Notice of Grant of Stock Option, Stock Option Agreement and Stock Option Exercise Notice thereunder.
10.3+	Celladon Corporation 2012 Equity Incentive Plan and Form of Stock Option Grant Notice, Option Agreement and Notice of Exercise thereunder.
10.4+	Celladon Corporation 2013 Equity Incentive Plan and Form of Stock Option Grant Notice, Option Agreement and Notice of Exercise thereunder.
10.5+	Celladon Corporation 2013 Employee Stock Purchase Plan.

Exhibit Number	Description of Document
10.6+	Celladon Corporation Non-Employee Director Compensation Policy.
10.7+	Employment Agreement by and between the Registrant and Jeffrey J. Rudy, dated September 3, 2013.
10.8+	Employment Agreement by and between the Registrant and Rebecque Laba, dated September 3, 2013.
10.9+	Employment Agreement by and between the Registrant and Ryan K. Takeya, dated September 2, 2013.
10.10+	Employment Agreement by and between the Registrant and Fredrik Wiklund, dated September 3, 2013.
10.11+	Employment Agreement by and between the Registrant and Krisztina M. Zsebo, Ph.D., dated as of August 30, 2013.
10.12+	Letter Agreement by and between the Registrant and Gregg Huber Alton, dated as of August 30, 2013.
10.13+	Letter Agreement by and between the Registrant and Graham Cooper, dated as of September 2, 2013.
10.14†	Office Lease by and between the Registrant and Arden Realty, Inc., dated as of March 6, 2012.
10.15*	License Agreement by and between the Registrant and the Regents of the University of California, dated February 10, 2001, as amended.
10.16*	Exclusive License Agreement by and between the Registrant and Martin J. Kaplitt, M.D., dated June 7, 2006.
10.17*	Non-Exclusive License Agreement by and between the Registrant and AskBio, LLC, dated January 15, 2008.
10.18	License Agreement by and between the Registrant and AdVec Inc., dated February 24, 2009.
10.19*	Exclusive Patent License Agreement by and between the Registrant and the Regents of the University of Minnesota, dated May 11, 2009.
10.20*	Non-Exclusive License Agreement by and between the Registrant and Virovek Incorporation, dated November 4, 2010.
10.21*	Amended and Restated License Agreement by and between the Registrant and AmpliPhi Biosciences Corporation, dated June 27, 2012.
10.22*	Sublicense Agreement by and between the Registrant and AmpliPhi Biosciences Corporation, dated June 27, 2012.
10.23*	Amended and Restated Manufacturing Services Agreement by and between the Registrant and Lonza Houston, Inc., dated August 26, 2013.
23.1†	Consent of Ernst & Young LLP, an Independent Registered Public Accounting Firm.
23.2†	Consent of Cooley LLP. Reference is made to Exhibit 5.1.
24.1	Power of Attorney. Reference is made to the signature page hereto.

† To be filed by amendment.
+ Indicates management contract or compensatory plan.
* Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the SEC.

(b) Financial Statement Schedules.

No financial statement schedules are provided because the information called for is not required or is shown either in the financial statements or the notes thereto.

Item 17. Undertakings.

The undersigned Registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer, or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question of whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(a) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(b) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

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SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Diego, State of California, on the day of , 2013.

CELLADON CORPORATION

Krisztina M. Zsebo, Ph.D.
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Krisztina M. Zsebo, Ph.D., and Rebecque J. Laba, and each of them, as his or her true and lawful attorneys-in-fact and agents, each with the full power of substitution, for him or her and in his or her name, place or stead, in any and all capacities, to sign any and all amendments to this registration statement (including post-effective amendments), and to sign any registration statement for the same offering covered by this registration statement that is to be effective upon filing pursuant to Rule 462(b) promulgated under the Securities Act, and all post-effective amendments thereto, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
Krisztina M. Zsebo, Ph.D.	President, Chief Executive Officer and Member of the Board of Directors *(Principal Executive Officer)*	, 2013
Rebecque J. Laba	Vice President, Finance and Administration *(Principal Financial and Accounting Officer)*	, 2013
Barbara J. Dalton, Ph.D.	Chairman of the Board of Directors	, 2013
Gregg Alton	Member of the Board of Directors	, 2013
Fouad Azzam, Ph.D.	Member of the Board of Directors	, 2013
Graham Cooper	Member of the Board of Directors	, 2013

Todd Foley	Member of the Board of Directors	, 2013
Joshua Funder, Ph.D.	Member of the Board of Directors	, 2013
Johan Kördel, Ph.D.	Member of the Board of Directors	, 2013
Daniel Omstead, Ph.D.	Member of the Board of Directors	, 2013
Andrew E. Senyei, M.D.	Member of the Board of Directors	, 2013
Lauren Silverman, Ph.D.	Member of the Board of Directors	, 2013

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23.1†	Consent of Ernst & Young LLP, an Independent Registered Public Accounting Firm.
23.2†	Consent of Cooley LLP. Reference is made to Exhibit 5.1.
24.1	Power of Attorney. Reference is made to the signature page hereto.

† To be filed by amendment.
+ Indicates management contract or compensatory plan.
* Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the SEC.

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF CELLADON CORPORATION

Krisztina M. Zsebo, Ph.D., hereby certifies that:

ONE: The original name of this corporation is Celladon Corporation and the date of filing the original Certificate of Incorporation of this corporation with the Secretary of State of the State of Delaware was February 24, 2012.

TWO: She is the duly elected and acting President and Chief Executive Officer of Celladon Corporation, a Delaware corporation.

THREE: The Certificate of Incorporation of this corporation is hereby amended and restated to read as follows:

I.

The name of this corporation is Celladon Corporation (the "***Company***").

II.

The address of the registered office of the Company in the State of Delaware is 1209 Orange Street, City of Wilmington, County of New Castle, Zip Code 19801, and the name of the registered agent of the Company in the State of Delaware at such address is The Corporation Trust Company.

III.

The purpose of the Company is to engage in any lawful act or activity for which a corporation may be organized under the Delaware General Corporation Law ("***DGCL***").

IV.

A. The Company is authorized to issue two classes of stock to be designated, respectively, "Common Stock" and "Preferred Stock." The total number of shares which the Company is authorized to issue is 315,982,396 shares, 172,249,444 shares of which shall be Common Stock (the "***Common Stock***") and 143,732,952 shares of which shall be Preferred Stock (the "***Preferred Stock***"). The Common Stock shall have a par value of $0.0001 per share. The par value per share of each series of Preferred Stock shall be as set forth below.

B. 131,594,871 of the authorized shares of Preferred Stock are hereby designated "Series A-1 Preferred Stock" (the "***Series A-1 Preferred***"), par value $0.0001 per share. 12,138,080 of the authorized shares of Preferred Stock are hereby designated "Junior Preferred Stock" (the "***Junior Preferred***" and collectively with the Series A-1 Preferred, the "***Series Preferred***"), par value $0.0001 per share. One (1) of the authorized shares of Preferred Stock is

hereby designated "Special Voting Preferred Stock" (the "***Special Voting Preferred***"), par value $1,000.00 per share.

C. Subject to any additional vote required by the holders of any class of Preferred Stock, the number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the votes represented by all outstanding shares of capital stock of the Company entitled to vote, irrespective of the provisions of Section 242(b)(2) of the DGCL or any successor thereto.

D. The rights, preferences, privileges, restrictions and other matters relating to the Series Preferred and the Special Voting Preferred are as follows:

1. Dividend Rights.

a. Holders of Series A-1 Preferred, in preference to the holders of any other stock of the Company (except Special Voting Preferred, but solely to the extent provided below) ("***Junior Stock***"), shall be entitled to receive, when and as declared by the Board of Directors, but only out of funds that are legally available therefor, cash dividends at the rate of eight percent of the "Series A-1 Original Issue Price" (as defined below) per annum on each outstanding share of Series A-1 Preferred (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares). The Original Issue Price of the Series A-1 Preferred shall be $0.449 (the "***Series A-1 Original Issue Price***") subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A-1 Preferred. Such dividends shall be payable only when, as and if declared by the Board of Directors and shall be non-cumulative. The holder of Special Voting Preferred shall be entitled to receive, when and as declared by the Board of Directors, but only out of funds that are legally available therefor, cash dividends at the rate of five percent of the par value of the Special Voting Preferred per annum on the outstanding share of Special Voting Preferred (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such share). Except as set forth in the preceding sentence, the Special Voting Preferred shall not be entitled to receive any dividends.

b. So long as any shares of Series A-1 Preferred shall be outstanding, no dividend, whether in cash or property, shall be paid or declared, nor shall any other distribution be made, on any Junior Stock, nor shall any shares of any Junior Stock of the Company be purchased, redeemed, or otherwise acquired for value by the Company (except for Permitted Acquisitions (as defined below)) until all dividends (set forth in Section 1(a) above) on the Series A-1 Preferred shall have been paid or declared and set apart. In the event dividends are paid on any share of Junior Preferred or Common Stock, an additional dividend shall be paid with respect to all outstanding shares of Series A-1 Preferred in an amount equal per share (on an as-if-converted to Common Stock basis) to the amount paid or set aside for each share of Common Stock. The provisions of this Section 1(b) shall not, however, apply to (i) a dividend payable in Common Stock for which an adjustment to the applicable Series A-1 Preferred Conversion Price is made pursuant to Section 5(f) below or (ii) any of the following (collectively, "***Permitted Acquisitions***"): (A) the acquisition of shares of Junior Stock as approved by the Company's Board of Directors pursuant to agreements which permit the

Company to repurchase such shares at no greater than cost upon termination of services to the Company or in exercise of the Company's right of first refusal upon a proposed transfer or (B) any repurchase of any outstanding securities of the Company that is unanimously approved by the Company's Board of Directors. The holders of the Series A-1 Preferred expressly waive their rights, if any, with regard to any preferential dividends arrears amount or any preferential rights amount (each as determined under applicable law) as they relate to Permitted Acquisitions.

2. Voting Rights.

a. General Rights. Except as otherwise provided herein or as required by law, the Series Preferred and the Special Voting Preferred shall vote together with the Common Stock of the Company and not as a separate class, at any annual or special meeting of stockholders of the Company, and may act by written consent in the same manner as the Common Stock. Each holder of shares of Series Preferred shall be entitled to such number of votes as shall be equal to the whole number of shares of Common Stock into which such holder's aggregate number of shares of Series Preferred are convertible (pursuant to Section 5 hereof) immediately after the close of business on the record date fixed for such meeting or the effective date of such written consent. The holder of the outstanding share of Special Voting Preferred shall be entitled to such number of votes as is equal to the number of votes to which the holder would have been entitled had such holder exchanged all shares of Celladon Europe, B.V., a private limited liability company established under the laws of the Netherlands ("***Celladon Europe***") or Exchangeable DRs (as defined in that certain Exchange Agreement, dated on or about the date this Amended and Restated Certificate of Incorporation is accepted for filing by the Secretary of State of the State of Delaware (the "***Original Filing Date***"), by and among the Company and the other parties thereto (as may be amended from time to time, the "***Exchange Agreement***")), then held by such holder and such holder's affiliates (such shares of Celladon Europe or Exchangeable DRs, as the case may be, the "***Exchangeable Shares***"), for shares of Series A-1 Preferred (or Common Stock if the Exchangeable Shares are then exchangeable for Common Stock) pursuant to the terms of the Exchange Agreement, immediately after the close of business on the record date fixed for such meeting or the effective date of such written consent. So long as the share of Special Voting Preferred remains outstanding, the Special Voting Preferred shall be entitled to vote or provide written consent in all instances where the Series A-1 Preferred or Series Preferred (or Common Stock if at such time all shares of Series A-1 Preferred have previously been converted into shares of Common Stock pursuant to Section 5(m) below) are entitled to vote or provide written consent, and with respect to any required vote or written consent of the holders of a minimum portion of the outstanding Series A-1 Preferred or Series Preferred, (i) the outstanding Series A-1 Preferred or Series Preferred, as applicable, shall be deemed to include all shares of Series A-1 Preferred, if any, then issuable upon exchange of the Exchangeable Shares pursuant to the Exchange Agreement and (ii) the holder of the Special Voting Preferred shall be deemed to hold the number of shares of Series A-1 Preferred then issuable upon exchange of the Exchangeable Shares pursuant to the Exchange Agreement. The Special Voting Preferred shall be cancelled and all voting rights of the Special Voting Preferred shall automatically terminate upon the exchange of any Exchangeable Shares for shares of Series A-1 Preferred (or Common Stock if the Exchangeable Shares are then exchangeable for Common Stock) pursuant to the terms of the Exchange Agreement.

b. Separate Vote of Series A-1 Preferred and Special Voting Preferred. So long as any shares of Series A-1 Preferred remain outstanding, in addition to any other vote or consent required herein or by law, the vote or written consent of the holders of at least 60% of the outstanding Series A-1 Preferred, voting together as a single class on an as-if-converted to Common Stock basis, shall be necessary for effecting or validating the following actions (whether taken by amendment, merger, consolidation or in any other manner), and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(i) Liquidate, dissolve or wind-up the business and affairs of the Company, effect any merger or consolidation or any other Deemed Liquidation Event (as defined in Section 3(d)), or consent to any of the foregoing;

(ii) Any amendment, alteration, or repeal of any provision of the Certificate of Incorporation or the Bylaws of the Company (including any filing of a Certificate of Designation);

(iii) Any authorization or any designation, whether by reclassification or otherwise, of any new class or series of stock or any other securities convertible into equity securities of the Company ranking on a parity with or senior to the Series A-1 Preferred in rights of redemption, liquidation preference, voting or dividends;

(iv) Any increase or decrease (other than by redemption or conversion) in the authorized number of shares of Common Stock or Preferred Stock or any series thereof;

(v) Any alteration or change in the voting powers, preferences, or other special rights or privileges, qualifications, limitations, or restrictions of the Series A-1 Preferred so as to affect adversely the shares of such class;

(vi) Reclassify, alter or amend any existing security of the Company that is *pari passu* with the Series A-1 Preferred in respect of the distribution of assets on the liquidation, dissolution or winding up of the Company, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to the Series A-1 Preferred in respect of any such right, preference or privilege;

(vii) Reclassify, alter or amend any existing security of the Company that is junior to the Series A-1 Preferred in respect of the distribution of assets on the liquidation, dissolution or winding up of the Company, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or *pari passu* with the Series A-1 Preferred in respect of any such right, preference or privilege;

(viii) Purchase or redeem for value (or permit any subsidiary to purchase or redeem for value) or pay or declare any dividend or make any distribution on, any shares of capital stock of the Company other than (i) redemptions of or dividends or distributions on the Series A-1 Preferred and the Special Voting Preferred as expressly authorized herein, (ii)

dividends or other distributions payable on the Common Stock solely in the form of additional shares of Common Stock and (iii) Permitted Acquisitions;

(ix) Create, or authorize the creation of, or issue, or authorize the issuance of any debt security, or permit any subsidiary to take any such action with respect to any debt security;

(x) Create, or hold capital stock in, any subsidiary other than Celladon Europe that is not wholly owned (either directly or through one or more other subsidiaries) by the Company, or sell, transfer or otherwise dispose of any capital stock of any direct or indirect subsidiary of the Company other than pursuant to that certain Amended and Restated Series A-1 and Junior Preferred Stock Purchase Agreement, dated on or about the Original Filing Date, by and among the Company and the other parties thereto (as may be amended from time to time, the "***Purchase Agreement***"), or permit any direct or indirect subsidiary to sell, lease, transfer, exclusively license or otherwise dispose (in a single transaction or series of related transactions) of all or substantially all of the assets of such subsidiary;

(xi) Any increase or decrease in the authorized number of members of the Company's Board of Directors;

(xii) Increase the number of shares authorized for issuance under any existing stock or option plan or create any new stock or option plan;

(xiii) Acquire a material amount of assets of another entity through a merger, asset purchase or similar transaction;

(xiv) Encumber or grant a security interest in any material asset of the Company; or

(xv) Any change in the nature of the Company's business.

c. Election of Board of Directors.

(i) The members of the Board of Directors shall be elected as follows:

(a) For so long as any shares of Series A-1 Preferred remain outstanding, the holders of Series A-1 Preferred and Special Voting Preferred, voting together as a single class on an as-if-converted to Common Stock basis with respect to the Series A-1 Preferred, shall be entitled to elect eight (8) members of the Company's Board of Directors (the "***Series A-1 Directors***") at each meeting or pursuant to each consent of the Company's stockholders for the election of directors, and to remove from office such directors and to fill any vacancy caused by the resignation, death or removal of such directors;

(b) the holders of Common Stock, voting as a separate class, shall be entitled to elect one member of the Board of Directors (the "***Common Director***") at each meeting or pursuant to each consent of the Company's stockholders for the

election of directors, and to remove from office such director and to fill any vacancy caused by the resignation, death or removal of such director; and

(c) the holders of Common Stock, Series Preferred and Special Voting Preferred, voting together as a single class on an as-if-converted to Common Stock basis with respect to the Series Preferred, shall be entitled to elect all remaining members of the Board of Directors at each meeting or pursuant to each consent of the Company's stockholders for the election of directors, and to remove from office such directors and to fill any vacancy caused by the resignation, death or removal of such directors.

(ii) No person entitled to vote at an election of directors may cumulate votes to which such person is entitled unless required by applicable law at the time of such election. During such time or times that applicable law requires cumulative voting, every stockholder entitled to vote at an election of directors may cumulate such stockholder's votes and give one candidate a number of votes equal to the number of directors to be elected multiplied by the number of votes to which such stockholder's shares are otherwise entitled, or distribute the stockholder's votes on the same principle among as many candidates as such stockholder desires. No stockholder, however, shall be entitled to so cumulate such stockholder's votes unless (A) the names of such candidate or candidates have been placed in nomination prior to the voting and (B) the stockholder has given notice at the meeting, prior to the voting, of such stockholder's intention to cumulate such stockholder's votes. If any stockholder has given proper notice to cumulate votes, all stockholders may cumulate their votes for any candidates who have been properly placed in nomination. Under cumulative voting, the candidates receiving the highest number of votes, up to the number of directors to be elected, are elected.

(iii) Subject to Section 2(c)(i) above, during such time or times that applicable law requires cumulative voting, the Board of Directors or any individual director may be removed from office at any time without cause by the affirmative vote of the holders of at least a majority of the outstanding shares entitled to elect such director or directors; *provided, however*, that unless the entire Board of Directors is removed, no individual director may be removed when the votes cast against such director's removal, or not consenting in writing to such removal, would be sufficient to elect that director if voted cumulatively at an election which the same total number of votes were cast (or, if such action is taken by written consent, all shares entitled to vote were voted) and the entire number of directors authorized at the time of such director's most recent election were then being elected.

(iv) At any time or times that cumulative voting is not required by applicable law and subject to any limitations imposed by law, Section 2(c)(iii) above shall not apply and the Board of Directors or any director may be removed from office at any time with or without cause by the affirmative vote of the holders of a majority of the voting power of all then-outstanding shares of the class or series of capital stock of the Company entitled to elect such director.

3. Liquidation Rights.

a. Upon any liquidation, dissolution, or winding up of the Company, whether voluntary or involuntary, including any Deemed Liquidation Event (as defined below),

before any distribution or payment shall be made to the holders of any Junior Stock, the holders of Series A-1 Preferred shall be entitled to be paid out of the assets of the Company an amount per share of Series A-1 Preferred equal to two (2) times the Series A-1 Original Issue Price plus all declared and unpaid dividends on such share of Series A-1 Preferred (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares) for each share of Series A-1 Preferred held by them. If, upon any liquidation, distribution, or winding up or any Deemed Liquidation Event, the assets of the Company shall be insufficient to make payment in full to all holders of Series A-1 Preferred of the liquidation preference set forth in this Section 3(a), then such assets shall be distributed among the holders of Series A-1 Preferred at the time outstanding, ratably in proportion to the full amounts to which they would otherwise be respectively entitled under this Section 3(a).

b. After the payment of the full liquidation preference of the Series A-1 Preferred as set forth in Section 3(a) above, but before any distribution or payment shall be made to the holders of Common Stock, the holders of Junior Preferred shall be entitled to be paid out of the assets of the Company an amount per share of Junior Preferred equal to $0.449 (the "***Junior Preferred Original Issue Price***") plus all declared and unpaid dividends on such share of Junior Preferred (as adjusted for any stock dividends, combinations, splits, recapitalizations and the like with respect to such shares) for each share of Junior Preferred held by them. If the remaining assets of the Company shall be insufficient to make payment in full to all holders of Junior Preferred of the liquidation preference set forth in this Section 3(b), then such assets shall be distributed among the holders of Junior Preferred at the time outstanding, ratably in proportion to the full amounts to which they would otherwise be respectively entitled under this Section 3(b).

c. After the payment of the full liquidation preferences as set forth in Sections 3(a) and 3(b) above, the assets of the Company legally available for distribution, if any, shall be distributed ratably to the holders of the Common Stock and Series A-1 Preferred on an as-if-converted to Common Stock basis. The Special Voting Preferred shall not be entitled to participate in any such distribution.

d. Unless the holders of at least 60% of the outstanding Series A-1 Preferred, voting together as a single class elect otherwise, the following events shall be considered a liquidation under this Section 3 (each such event, a "***Deemed Liquidation Event***"): (i) any consolidation or merger of the Company with or into any other corporation or other entity or person, or any other corporate reorganization, in which the stockholders of the Company immediately prior to such consolidation, merger or reorganization, own less than 50% of the Company's voting power immediately after such consolidation, merger or reorganization, or any transaction or series of related transactions in which in excess of 50% of the Company's voting power is transferred, but excluding (x) any transaction effected exclusively to change the domicile of the Company or a parent of the Company, (y) any transaction effected solely for bona fide equity financing purposes in which cash is received by the Company or indebtedness of the Company is cancelled or converted or a combination thereof and (z) a consolidation with a wholly-owned subsidiary of the Company; or (ii) a sale, lease or other disposition of all or substantially all of the assets of the Company or a license of all or substantially all of the intellectual property of the Company in all or substantially all fields of use.

e. In the event of a Deemed Liquidation Event, if the consideration received by the Company is other than cash, its value will be deemed its fair market value. Any securities shall be valued as follows:

(i) Securities not subject to investment letter or other similar restrictions on free marketability:

(a) If traded on a securities exchange or The Nasdaq Stock Market ("***Nasdaq***"), the value shall be based on the formula specified in the definitive agreements for the Deemed Liquidation Event or, if no such formula exists, then the value of such securities shall be based on a formula approved by the Board of Directors and derived from the closing prices of the securities on such exchange or Nasdaq over a specified time period;

(b) If actively traded over-the-counter, the value shall be based on the formula specified in the definitive agreements for the Deemed Liquidation Event or, if no such formula exists, then the value of such securities shall be based on a formula approved by the Board of Directors and derived from the closing bid or sales prices (whichever is applicable) for such securities over a specified time period; and

(c) If there is no active public market, the value shall be the fair market value thereof, as determined in good faith by the Board of Directors.

(ii) The method of valuation of securities subject to investment letter or other restrictions on free marketability (other than restrictions arising solely by virtue of a stockholder's status as an affiliate or former affiliate) shall be to make an appropriate discount from the market value determined as specified above in Section 3(e)(i) to reflect the approximate fair market value thereof, as determined in good faith by the Board of Directors.

f. In the event of a Deemed Liquidation Event, if any portion of the consideration payable to the stockholders of the Company is placed into escrow and/or is payable to the stockholders of the Company subject to contingencies, the definitive agreement relating to the transaction contemplated pursuant to the Deemed Liquidation Event shall provide that (i) the portion of such consideration that is not placed in escrow and not subject to any contingencies (the "***Initial Consideration***") shall be allocated among the holders of capital stock of the Company in accordance with Sections 3(a), 3(b) and 3(c) as if the Initial Consideration were the only consideration payable in connection with such Deemed Liquidation Event, and (ii) any additional consideration which becomes payable to the stockholders of the Company upon release from escrow or satisfaction of contingencies shall be allocated among the holders of capital stock of the Company in accordance with Sections 3(a), 3(b) and 3(c) after taking into account the previous payment of the Initial Consideration as part of the same transaction.

4. Redemption.

a. Unless prohibited by Delaware law governing distributions to stockholders, shares of Series A-1 Preferred shall be redeemed by the Company at a price equal to the Series A-1 Original Issue Price per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A-1 Preferred, plus all declared but unpaid dividends thereon (the "***Redemption Price***"),

in three annual installments commencing not more than 60 days following the affirmative election of the holders of at least 60% of the then outstanding shares of Series A-1 Preferred by vote or written consent, at any time on or after January 27, 2017, to redeem all shares of Series A-1 Preferred (the "***Redemption Request***"). The date of each such installment shall be referred to as a "***Redemption Date***". On each Redemption Date, the Company shall redeem, on a pro rata basis in accordance with the number of shares of Series A-1 Preferred owned by each holder, that number of outstanding shares of Series A-1 Preferred determined by dividing (i) the total number of shares of Series A-1 Preferred outstanding immediately prior to such Redemption Date by (ii) the number of remaining Redemption Dates (including the Redemption Date to which such calculation applies); *provided*, *however*, that Excluded Shares (as such term is defined in Section 4(b)) shall not be redeemed and shall be excluded from the calculations set forth in this sentence. If on any Redemption Date Delaware law governing distributions to stockholders prevents the Company from redeeming all shares of Series A-1 Preferred to be redeemed, the Company shall ratably redeem the maximum number of shares that it may redeem consistent with such law, and shall redeem the remaining shares as soon as it may lawfully do so under such law.

b. The Company shall send written notice of the mandatory redemption (the "***Redemption Notice***") to each holder of record of Series A-1 Preferred and Exchangeable Shares not less than 40 days prior to each Redemption Date. Each Redemption Notice shall state: (i) the number of shares of Series A-1 Preferred held by the holder (or the number of shares that the holder would hold if such holder exchanged the Exchangeable Shares) that the Company shall redeem on the Redemption Date specified in the Redemption Notice; (ii) the Redemption Date and the Redemption Price; and (iii) that the holder is to surrender to the Company, in the manner and at the place designated, his, her or its certificate or certificates representing the shares of Series A-1 Preferred to be redeemed or, if applicable, that the holder is to exchange any Exchangeable Shares for the shares of Series A-1 Preferred to be redeemed.

If the Company receives, on or prior to the 20th day after the date of delivery of the Redemption Notice to a holder of Series A-1 Preferred or Exchangeable Shares, written notice from such holder that such holder elects to be excluded from the redemption provided in this Section 4, then the shares of Series A-1 Preferred registered on the books of the Company in the name of such holder at the time of the Company's receipt of such notice and, if applicable, the shares of Series A-1 Preferred issuable upon exchange if Exchangeable Shares held by such holder at the time of the Company's receipt of such notice, shall thereafter be "***Excluded Shares***." Excluded Shares shall not be redeemed or redeemable pursuant to this Section 4, whether on such Redemption Date or thereafter.

c. On or before the applicable Redemption Date, each holder of shares of Series A-1 Preferred to be redeemed on such Redemption Date shall surrender the certificate or certificates representing such shares (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Company to indemnify the Company against any claim that may be made against the Company on account of the alleged loss, theft or destruction of such certificate) to the Company, in the manner and at the place designated in the Redemption Notice, and thereupon the Redemption Price for such shares shall be payable to the order of the person whose name appears on such certificate or certificates as the owner thereof. In the event less than all of the

shares of Series A-1 Preferred represented by a certificate are redeemed, a new certificate representing the unredeemed shares of Series A-1 Preferred shall promptly be issued to such holder.

d. If the Redemption Notice shall have been duly given, and if on the applicable Redemption Date the Redemption Price payable upon redemption of the shares of Series A-1 Preferred to be redeemed on such Redemption Date is paid or tendered for payment or deposited with an independent payment agent so as to be available therefor in a timely manner, then notwithstanding that the certificates evidencing any of the shares of Series A-1 Preferred so called for redemption shall not have been surrendered, and all rights with respect to such shares shall forthwith after the Redemption Date terminate, except only the right of the holders to receive the Redemption Price without interest upon surrender of their certificate or certificates therefor.

e. Shares of Junior Preferred and the share of Special Voting Preferred shall not be redeemable.

5. Conversion Rights.

The holders of the Series Preferred shall have the following rights with respect to the conversion of the Series Preferred into shares of Common Stock (the "***Conversion Rights***"):

a. Optional Conversion. Subject to and in compliance with the provisions of this Section 5, any shares of Series Preferred may, at the option of the holder, be converted pursuant to this Section 5(a) into fully-paid and nonassessable shares of Common Stock at any time. The number of shares of Common Stock to which a holder of Series Preferred shall be entitled upon conversion pursuant to this Section 5(a) shall be obtained by multiplying the Series Preferred Conversion Rate (as defined below) by the number of shares of Series Preferred being converted.

b. Series Preferred Conversion Rate. The conversion rate in effect at any time for conversion of the Series Preferred (as applicable, the "***Series Preferred Conversion Rate***") shall be the quotient obtained by dividing the applicable Original Issue Price of the Series Preferred by the applicable "Series Preferred Conversion Price," calculated as provided in Section 5(c).

c. Conversion Price. The conversion price for the Series Preferred shall initially be the Original Issue Price of such Series Preferred (as applicable, the "***Series Preferred Conversion Price***"). Each initial Series Preferred Conversion Price shall be adjusted from time to time in accordance with this Section 5. All references to the applicable Series Preferred Conversion Price herein shall mean the applicable Series Preferred Conversion Price as so adjusted.

d. Mechanics of Conversion. Each holder of Series Preferred who desires to convert the same into shares of Common Stock pursuant to this Section 5 shall surrender the certificate or certificates therefor, duly endorsed, or the holder shall notify the Company or its transfer agent that such certificates have been lost, stolen or destroyed and

execute an agreement reasonably satisfactory to the Company to indemnify the Company from any loss incurred by it in connection with such lost, stolen or destroyed certificates (a "***Loss Affidavit***") at the office of the Company or any transfer agent for the Series Preferred, and shall give written notice to the Company at such office that such holder elects to convert the same. Such notice shall state the number of shares of Series Preferred being converted. Thereupon, the Company shall promptly issue and deliver at such office to such holder a certificate or certificates for the number of shares of Common Stock to which such holder is entitled and shall promptly pay in cash or, to the extent sufficient funds are not then legally available therefor, in Common Stock (at the Common Stock's fair market value as determined by the Board of Directors as of the date of such conversion), any declared and unpaid dividends on the shares of Series Preferred being converted. Such conversion shall be deemed to have been made at the close of business on the date of such surrender of the certificates representing the shares of Series Preferred to be converted, and the person entitled to receive the shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holder of such shares of Common Stock on such date.

e. Adjustment for Stock Splits and Combinations. If the Company shall at any time or from time to time after the Original Filing Date effect a subdivision of the outstanding Common Stock without a corresponding subdivision of the applicable Series Preferred, the applicable Series Preferred Conversion Price in effect immediately before that subdivision shall be proportionately decreased. Conversely, if the Company shall at any time or from time to time after the Original Filing Date combine the outstanding shares of Common Stock into a smaller number of shares without a corresponding combination of the applicable Series Preferred, the applicable Series Preferred Conversion Price in effect immediately before the combination shall be proportionately increased. Any adjustment under this Section 5(e) shall become effective at the close of business on the date the subdivision or combination becomes effective.

f. Adjustment for Common Stock Dividends and Distributions. If the Company at any time or from time to time after the Original Filing Date makes, or fixes a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in additional shares of Common Stock, in each such event the applicable Series Preferred Conversion Price that is then in effect shall be decreased as of the time of such issuance or, in the event such record date is fixed, as of the close of business on such record date, by multiplying such Series Preferred Conversion Price then in effect by a fraction (1) the numerator of which is the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date and (2) the denominator of which is the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date plus the number of shares of Common Stock issuable in payment of such dividend or distribution; *provided*, *however*, that if such record date is fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, such Series Preferred Conversion Price shall be recomputed accordingly as of the close of business on such record date and thereafter such Series Preferred Conversion Price shall be adjusted pursuant to this Section 5(f) to reflect the actual payment of such dividend or distribution.

g. Adjustments for Other Dividends and Distributions. If the Company at any time or from time to time after the Original Filing Date makes, or fixes a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in securities of the Company other than shares of Common Stock (other than a Deemed Liquidation Event as defined in Section 3(e) or a subdivision or combination of shares or stock dividend or a reorganization, merger, consolidation or sale of assets provided for elsewhere in this Section 5), in each such event provision shall be made so that the holders of the Series Preferred (including holders of Exchangeable Shares to the extent such Exchangeable Shares are exchangeable for Series A-1 Preferred) shall receive upon conversion thereof, in addition to the number of shares of Common Stock receivable thereupon, the amount of other securities of the Company which they would have received had their Series Preferred been converted into Common Stock on the date of such event and had they thereafter, during the period from the date of such event to and including the conversion date, retained such securities receivable by them as aforesaid during such period, subject to all other adjustments called for during such period under this Section 5 with respect to the rights of the holders of the Series Preferred or with respect to such other securities by their terms.

h. Adjustment for Reclassification, Exchange and Substitution. If at any time or from time to time after the Original Filing Date, the Common Stock issuable upon the conversion of the Series Preferred is changed into the same or a different number of shares of any class or classes of stock, whether by recapitalization, reclassification or otherwise (other than a Deemed Liquidation Event as defined in Section 3(e) or a subdivision or combination of shares or stock dividend or a reorganization, merger, consolidation or sale of assets provided for elsewhere in this Section 5), in any such event each holder of Series Preferred (including holders of Exchangeable Shares to the extent such Exchangeable Shares are exchangeable for Series A-1 Preferred) shall have the right thereafter to convert such stock into the kind and amount of stock and other securities and property receivable upon such recapitalization, reclassification or other change by holders of the maximum number of shares of Common Stock into which such shares of Series Preferred could have been converted immediately prior to such recapitalization, reclassification or change, all subject to further adjustment as provided herein or with respect to such other securities or property by the terms thereof.

i. Reorganizations, Mergers, Consolidations or Sales of Assets. If at any time or from time to time after the Original Filing Date, there is a capital reorganization of the Common Stock (other than a Deemed Liquidation Event as defined in Section 3(e) or a recapitalization, subdivision, combination, reclassification, exchange or substitution of shares provided for elsewhere in this Section 5), as a part of such capital reorganization, provision shall be made so that the holders of the Series Preferred (including holders of Exchangeable Shares to the extent such Exchangeable Shares are exchangeable for Series A-1 Preferred) shall thereafter be entitled to receive upon conversion of the Series Preferred the number of shares of stock or other securities or property of the Company to which a holder of the number of shares of Common Stock deliverable upon conversion would have been entitled on such capital reorganization, subject to adjustment in respect of such stock or securities by the terms thereof. In any such case, appropriate adjustment shall be made in the application of the provisions of this Section 5 with respect to the rights of the holders of Series Preferred (including holders of Exchangeable Shares to the extent such Exchangeable Shares are exchangeable for Series A-1 Preferred) after the capital reorganization to the end that the provisions of this Section 5

(including adjustment of each applicable Series Preferred Conversion Price then in effect and the number of shares issuable upon conversion of the Series Preferred) shall be applicable after that event and be as nearly equivalent as practicable.

j. Sale of Shares Below Series Preferred Conversion Price.

(i) If at any time or from time to time after the Original Filing Date, the Company issues or sells, or is deemed by the express provisions of this subsection (j) to have issued or sold, Additional Shares of Common Stock (as defined in subsection (j)(iv) below), other than as a dividend or other distribution on any class of stock as provided in Section 5(f) above, and other than a subdivision or combination of shares of Common Stock as provided in Section 5(e) above, for an Effective Price (as defined in subsection (j)(iv) below) less than the then effective applicable Series Preferred Conversion Price, then and in each such case the then effective applicable Series Preferred Conversion Price shall be reduced, as of the opening of business on the date of such issue or sale, to a price determined by multiplying such Series Preferred Conversion Price by a fraction (i) the numerator of which shall be (A) the number of shares of Common Stock deemed outstanding (as defined below) immediately prior to such issue or sale plus (B) the number of shares of Common Stock which the aggregate consideration received (as defined in subsection (j)(ii)) by the Company for the total number of Additional Shares of Common Stock so issued would purchase at such Series Preferred Conversion Price and (ii) the denominator of which shall be the number of shares of Common Stock deemed outstanding (as defined below) immediately prior to such issue or sale plus the total number of Additional Shares of Common Stock so issued. For the purposes of the preceding sentence, the number of shares of Common Stock deemed to be outstanding as of a given date shall be the sum of (A) the number of shares of Common Stock actually outstanding, (B) the number of shares of Common Stock into which the then outstanding shares of Preferred Stock could be converted if fully converted on the day immediately preceding the given date (assuming the exchange of all Exchangeable Shares pursuant to the Exchange Agreement) and (C) the number of shares of Common Stock which could be obtained through the exercise or conversion of all other rights, options and convertible securities outstanding on the day immediately preceding the given date.

(ii) For the purpose of making any adjustment required under this Section 5(j), the consideration received by the Company for any issue or sale of securities shall (A) to the extent it consists of cash, be computed at the net amount of cash received by the Company after deduction of any underwriting or similar commissions, compensation or concessions paid or allowed by the Company in connection with such issue or sale but without deduction of any expenses payable by the Company, (B) to the extent it consists of property other than cash, be computed at the fair value of that property as determined in good faith by the Board of Directors and (C) if Additional Shares of Common Stock, Convertible Securities (as defined in subsection (j)(iii) below) or rights or options to purchase either Additional Shares of Common Stock or Convertible Securities are issued or sold together with other stock or securities or other assets of the Company for a consideration which covers both, be computed as the portion of the consideration so received that may be reasonably determined in good faith by the Board of Directors to be allocable to such Additional Shares of Common Stock, Convertible Securities or rights or options.

(iii) For the purpose of the adjustment required under this Section 5(j), if the Company issues or sells any rights or options for the purchase of, or stock or other securities convertible into, Additional Shares of Common Stock (such convertible stock or securities being herein referred to as "***Convertible Securities***") and if the Effective Price of such Additional Shares of Common Stock is less than the applicable Series Preferred Conversion Price, in each case the Company shall be deemed to have issued at the time of the issuance of such rights or options or Convertible Securities the maximum number of Additional Shares of Common Stock issuable upon exercise or conversion thereof and to have received as consideration for the issuance of such shares an amount equal to the total amount of the consideration, if any, received by the Company for the issuance of such rights or options or Convertible Securities, plus, in the case of such rights or options, the minimum amounts of consideration, if any, payable to the Company upon the exercise of such rights or options, plus, in the case of Convertible Securities, the minimum amounts of consideration, if any, payable to the Company (other than by cancellation of liabilities or obligations evidenced by such Convertible Securities) upon the conversion thereof; provided that if in the case of Convertible Securities the minimum amounts of such consideration cannot be ascertained, but are a function of antidilution or similar protective clauses, the Company shall be deemed to have received the minimum amounts of consideration without reference to such clauses; provided further that if the minimum amount of consideration payable to the Company upon the exercise or conversion of rights, options or Convertible Securities is reduced over time or on the occurrence or non-occurrence of specified events other than by reason of antidilution adjustments, the Effective Price shall be recalculated at such time using the figure to which such minimum amount of consideration is reduced; provided further that if the minimum amount of consideration payable to the Company upon the exercise or conversion of such rights, options or Convertible Securities is subsequently increased, the Effective Price shall be again recalculated using the increased minimum amount of consideration payable to the Company upon the exercise or conversion of such rights, options or Convertible Securities. No further adjustment of such Series Preferred Conversion Price, as adjusted upon the issuance of such rights, options or Convertible Securities, shall be made as a result of the actual issuance of Additional Shares of Common Stock on the exercise of any such rights or options or the conversion of any such Convertible Securities. If any such rights or options or the conversion privilege represented by any such Convertible Securities shall expire without having been exercised, such Series Preferred Conversion Price as adjusted upon the issuance of such rights, options or Convertible Securities shall be readjusted to the applicable Series Preferred Conversion Price which would have been in effect had an adjustment been made on the basis that the only Additional Shares of Common Stock so issued were the Additional Shares of Common Stock, if any, actually issued or sold on the exercise of such rights or options or rights of conversion of such Convertible Securities, and such Additional Shares of Common Stock, if any, were issued or sold for the consideration actually received by the Company upon such exercise, plus the consideration, if any, actually received by the Company for the granting of all such rights or options, whether or not exercised, plus the consideration received for issuing or selling the Convertible Securities actually converted, plus the consideration, if any, actually received by the Company (other than by cancellation of liabilities or obligations evidenced by such Convertible Securities) on the conversion of such Convertible Securities, provided that such readjustment shall not apply to prior conversions of Series Preferred.

(iv) "***Additional Shares of Common Stock***" shall mean all shares of Common Stock issued by the Company or deemed to be issued pursuant to this Section 5(j), whether or not subsequently reacquired or retired by the Company, other than the Excluded Securities. "***Excluded Securities***" shall mean (1) shares of Common Stock issued upon conversion of the Series Preferred and upon exchange of the Exchangeable Shares or as a stock split or dividend on the Series Preferred for which an adjustment to the applicable Series Preferred Conversion Price is made pursuant to Section 5(e) or 5(f); (2) shares of Common Stock and/or options, warrants or other Common Stock purchase rights and the Common Stock issued pursuant to such options, warrants or other rights issued after the Original Filing Date to employees, officers or directors of, or consultants or advisors to, the Company or any subsidiary pursuant to stock purchase or stock option plans or other arrangements, in each instance that are approved by the Board of Directors (including a majority of the Series A-1 Directors); (3) shares of Common Stock issued pursuant to the exercise of options, warrants or convertible securities outstanding as of the Original Filing Date; (4) shares of Common Stock or rights to purchase Common Stock issued or issuable to banks, equipment lessors or other financial institutions, or to real property lessors, pursuant to a debt financing, equipment leasing or real property leasing transaction approved by the Board of Directors (including a majority of the Series A-1 Directors); and (5) the share of Special Voting Preferred and the shares of Series A-1 Preferred issued upon exchange of the Exchangeable Shares pursuant to the Exchange Agreement. The "***Effective Price***" of Additional Shares of Common Stock shall mean the quotient determined by dividing the total number of Additional Shares of Common Stock issued or sold, or deemed to have been issued or sold by the Company under this Section 5(j), into the aggregate consideration received, or deemed to have been received by the Company for such issue under this Section 5(j), for such Additional Shares of Common Stock.

k. Certificate of Adjustment. In each case of an adjustment or readjustment of the applicable Series Preferred Conversion Price for the number of shares of Common Stock or other securities issuable upon conversion of the applicable Series Preferred, if such Series Preferred is then convertible pursuant to this Section 5, the Company, at its expense, shall promptly compute such adjustment or readjustment in accordance with the provisions hereof and prepare a certificate showing such adjustment or readjustment, and shall mail such certificate, by first class mail, postage prepaid, to each registered holder of such Series Preferred or any Exchangeable Shares at the holder's address as shown in the Company's books or the books of Celladon Europe, as applicable, and no later than 30 days following the effective date of such adjustment or readjustment. The certificate shall set forth such adjustment or readjustment, showing in detail the facts upon which such adjustment or readjustment is based, including a statement of (1) the consideration received or deemed to be received by the Company for any Additional Shares of Common Stock issued or sold or deemed to have been issued or sold, (2) each Series Preferred Conversion Price in effect at the time, (3) the number of Additional Shares of Common Stock and (4) the type and amount, if any, of other property which at the time would be received upon conversion of each share of Series Preferred.

l. Notices of Record Date. Upon (i) any taking by the Company of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend or other distribution or (ii) any Deemed Liquidation Event or other capital reorganization of the Company, any reclassification or recapitalization of the capital stock of the Company, any merger or consolidation of the

Company with or into any other corporation, or any voluntary or involuntary dissolution, liquidation or winding up of the Company, the Company shall mail to each holder of Series Preferred and Exchangeable Shares at least 20 days prior to the record date or effective date, as applicable, specified therein a notice specifying (1) the date on which any such record is to be taken for the purpose of such dividend or distribution and a description of such dividend or distribution, (2) the date on which any such Deemed Liquidation Event, reorganization, reclassification, transfer, consolidation, merger, dissolution, liquidation or winding up is expected to become effective and (3) the date, if any, that is to be fixed as to when the holders of record of Common Stock (or other securities) shall be entitled to exchange their shares of Common Stock (or other securities) for securities or other property deliverable upon such Deemed Liquidation Event, reorganization, reclassification, transfer, consolidation, merger, dissolution, liquidation or winding up.

m. Automatic Conversion.

(i) Each share of Series Preferred shall automatically be converted into shares of Common Stock based on the then-effective applicable Series Preferred Conversion Rate, at such time (the "***Election/IPO Conversion Time***") as (A) may be designated by the holders of at least 60% of the outstanding shares of Series A-1 Preferred, voting as a separate class on an as-if-converted to Common Stock basis, or (B) is immediately prior to the closing of a firmly underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, covering the offer and sale of Common Stock for the account of the Company in which the gross cash proceeds to the Company (after deduction of underwriting commissions and expenses) are at least $50,000,000 and the offering price per share is not less than three times the Series A-1 Original Issue Price. Upon the Election/IPO Conversion Time, any declared and unpaid dividends shall be paid in accordance with the provisions of Section 5(d).

(ii) Upon the Election/IPO Conversion Time, the outstanding shares of Series Preferred that are subject to automatic conversion as provided above, as applicable, shall be converted automatically without any further action by the holders of such shares and whether or not the certificates representing such shares are surrendered to the Company or its transfer agent; *provided, however*, that the Company shall not be obligated to issue certificates evidencing the shares of Common Stock issuable upon such conversion unless the certificates evidencing such shares of Series Preferred or a Loss Affidavit are delivered to the Company or its transfer agent as provided below. Upon the occurrence of such automatic conversion of such Series Preferred, the holders of such Series Preferred shall surrender the certificates (or Loss Affidavit) representing such shares at the office of the Company or any transfer agent for the Series Preferred. Thereupon, there shall be issued and delivered to such holder promptly at such office and in its name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of shares of Common Stock into which the shares of Series Preferred surrendered were convertible on the date on which such automatic conversion occurred, and any declared and unpaid dividends shall be paid in accordance with the provisions of Section 5(d).

n. Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of Series Preferred. All shares of Common Stock (including fractions

thereof) issuable upon conversion of more than one share of Series Preferred by a holder thereof shall be aggregated for purposes of determining whether the conversion would result in the issuance of any fractional share. If, after the aforementioned aggregation, the conversion would result in the issuance of any fractional share, the Company shall, in lieu of issuing any fractional share, pay cash equal to the product of such fraction multiplied by the Common Stock's fair market value (as determined by the Board of Directors) on the date of conversion.

o. Reservation of Stock Issuable Upon Conversion. The Company shall at all times reserve and keep available out of its authorized but unissued shares of Common Stock, solely for the purpose of effecting the conversion of the shares of the Series Preferred, such number of its shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of the Series Preferred. If at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Series Preferred (including any Series A-1 Preferred issuable upon exchange of any outstanding Exchangeable Shares), the Company will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purpose.

p. Notices. Any notice required by the provisions of this Section 5 shall be in writing and shall be deemed effectively given: (i) upon personal delivery to the party to be notified, (ii) when sent by confirmed telex or facsimile if sent during normal business hours of the recipient; if not, then on the next business day, (iii) five days after having been sent by registered or certified mail, return receipt requested, postage prepaid or (iv) one day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All notices shall be addressed to each holder of record at the address of such holder appearing on the books of the Company or, in the case of notices to holders of Exchangeable Shares, the address of such holder appearing on the books of Celladon Europe.

q. Payment of Taxes. The Company will pay all taxes (other than taxes based upon income) and other governmental charges that may be imposed with respect to the issue or delivery of shares of Common Stock upon conversion of shares of Series Preferred, excluding any tax or other charge imposed in connection with any transfer involved in the issue and delivery of shares of Common Stock in a name other than that in which the shares of Series Preferred so converted were registered.

r. No Dilution or Impairment. Without the consent of the holders of the then outstanding Series A-1 Preferred, as required under Section 2(b), as applicable, the Company shall not amend this Amended and Restated Certificate of Incorporation or participate in any reorganization, transfer of assets, consolidation, merger, Deemed Liquidation Event, dissolution, issue or sale of securities or take any other voluntary action, for the purpose of avoiding or seeking to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Company, but shall at all times in good faith assist in carrying out all such action as may be reasonably necessary or appropriate in order to protect the conversion rights of the holders of the Series Preferred against dilution or other impairment.

s. Special Mandatory Conversion.

(i) Unless the holders of at least 60% of the outstanding shares of Series A-1 Preferred otherwise consent in writing (with notice to the Company) prior to the applicable Commitment Deadline (as defined in the Purchase Agreement) or applicable Funding Deadline (as defined in the Purchase Agreement), as applicable, all shares of Series A-1 Preferred held by any Non-Participating Purchaser (as defined in the Purchase Agreement) on the date of such Commitment Deadline or Funding Deadline, as applicable (including any shares of Series A-1 Preferred issuable upon exchange of any Exchangeable Shares held by any Non-Participating Purchaser), shall automatically, and without any further action on the part of such Non-Participating Purchaser, be converted into Common Stock at a rate of one (1) share of Common Stock for every ten (10) shares of Series A-1 Preferred; *provided*, that the Company has delivered to such Non-Participating Purchaser written notice of such Milestone Closing (as defined in the Purchase Agreement) as provided for in the Purchase Agreement. Such conversion is referred to as a "***Special Mandatory Conversion***."

(ii) Upon a Special Mandatory Conversion, each holder of shares of Series A-1 Preferred converted pursuant to Section 5(s)(i) shall be sent written notice of such Special Mandatory Conversion and the place designated for mandatory conversion of all such shares of Series A-1 Preferred pursuant to this Section 5(s). Upon receipt of such notice, each such holder shall surrender his, her or its certificate or certificates for all such applicable shares (or, if such holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Company to indemnify the Company against any claim that may be made against the Company on account of the alleged loss, theft or destruction of such certificate) to the Company at the place designated in such notice. If so required by the Company, certificates surrendered for conversion shall be endorsed or accompanied by written instrument or instruments of transfer, in form satisfactory to the Company, duly executed by the registered holder or by his, her or its attorney duly authorized in writing. All rights with respect to the Series A-1 Preferred converted pursuant to Section 5(s)(i), including the rights, if any, to receive notices and vote (other than as a holder of Common Stock), will terminate at the time of the Special Mandatory Conversion (notwithstanding the failure of the holder or holders thereof to surrender the certificates for such shares at or prior to such time), except only the rights of the holders thereof, upon surrender of their certificate or certificates therefor (or lost certificate affidavit and agreement), to receive the items provided for in the next sentence of this Section 5(s)(ii). As soon as practicable after the Special Mandatory Conversion and the surrender of the certificate or certificates (or lost certificate affidavit and agreement) for Series A-1 Preferred so converted, the Company shall issue and deliver to such holder, a certificate or certificates for the number of full shares of Common Stock issuable on such conversion in accordance with the provisions hereof, together with cash as provided in Section 5(n) in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion. All converted Series A-1 Preferred shall be retired and cancelled and may not be reissued as shares of such series.

6. No Reissuance of Preferred Stock. No share or shares of Preferred Stock acquired by the Company by reason of redemption, purchase, conversion or otherwise shall be reissued; and in addition, the Certificate of Incorporation shall be appropriately amended to effect the corresponding reduction in the Company's authorized stock.

7. No Preemptive Rights. Stockholders shall have no preemptive rights except as set forth in the Certificate of Incorporation; provided that the Company may grant rights of first refusal to stockholders pursuant to written agreements approved by the Board of Directors of the Company.

V.

A. The liability of the directors of the Company for monetary damages shall be eliminated to the fullest extent permissible under applicable law.

B. To the fullest extent permitted by applicable law, the Company is authorized to provide indemnification of (and advancements of expenses to) directors, officers and agents of the Company (and any other persons to which applicable law permits the Company to provide indemnification) through bylaw provisions, agreements with such persons, or otherwise, in excess of the indemnification and advancement of expenses otherwise permitted by such applicable law. If, after the effective date of this Article, applicable law is amended in a manner which permits a corporation to limit the monetary or other liability of its directors or to authorize indemnification of, or advancement of such defense expenses to, its directors or to authorize indemnification of, or advancement of such defense expenses to, its directors or other persons, in any such case to a greater extent than is permitted on such effective date, the references in this Article to "applicable law" shall to that extent be deemed to refer to such applicable law as so amended.

C. Any repeal or modification of this Article shall only be prospective and shall not affect the rights under this Article in effect at the time of the alleged occurrence of any action or omission to act giving rise to liability.

VI.

The Company renounces, to the fullest extent permitted by the laws of the State of Delaware, any interest or expectancy of the Company in, or in being offered an opportunity to participate in, any Excluded Opportunity. An "***Excluded Opportunity***" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of, (i) any director of the Company who is not an employee of the Company or any of its subsidiaries, or (ii) any holder of Preferred Stock or Exchangeable Shares or any partner, member, director, stockholder, employee, agent or investment adviser of any such holder, other than someone who is an employee of the Company or any of its subsidiaries (collectively, "***Covered Persons***"), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of the Company. No amendment or repeal of this provision shall apply to or have any effect on the liability or alleged liability of any director or stockholder of the Company for or with respect to any opportunities of which such director or stockholder becomes aware prior to such amendment or repeal.

* * * *

FOUR: This Amended and Restated Certificate of Incorporation has been duly approved by the Board of Directors of the Company in accordance with the provisions of Sections 242 and 245 of the DGCL.

FIVE: This Amended and Restated Certificate of Incorporation was approved by the holders of the requisite number of shares of the Company in accordance with Section 228 of the DGCL. This Amended and Restated Certificate of Incorporation has been duly adopted in accordance with the provisions of Sections 242 and 245 of the DGCL by the stockholders of the Company.

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IN WITNESS WHEREOF, Celladon Corporation has caused this Amended and Restated Certificate of Incorporation to be signed by its President and Chief Executive Officer this 26th day of April, 2012.

/s/ Krisztina M. Zsebo
Krisztina M. Zsebo, Ph.D.
President and Chief Executive Officer

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF CELLADON CORPORATION

Celladon Corporation, a corporation organized and existing under the laws of the State of Delaware, hereby certifies as follows:

FIRST: The name of this corporation is Celladon Corporation.

SECOND: The date on which the corporation's Certificate of Incorporation was originally filed with the Secretary of State of the State of Delaware is February 24, 2012.

THIRD: The Certificate of Incorporation of said corporation shall be amended and restated to read in full as follows:

I.

The name of this corporation is Celladon Corporation (the "***Company***").

II.

The address of the registered office of the Company in the State of Delaware is 1209 Orange Street, City of Wilmington, County of New Castle, Delaware, 19801 and the name of the registered agent of the Company in the State of Delaware at such address is The Corporation Trust Company.

III.

The purpose of the Company is to engage in any lawful act or activity for which a corporation may be organized under the Delaware General Corporation Law (the "***DGCL***").

IV.

A. The Company is authorized to issue two classes of stock to be designated, respectively, "***Common Stock***" and "***Preferred Stock***." The total number of shares which the Company is authorized to issue is 210,000,000 shares. 200,000,000 shares shall be Common Stock, each having a par value of $0.001. 10,000,000 shares shall be Preferred Stock, each having a par value of $0.001.

B. The Preferred Stock may be issued from time to time in one or more series. The Board of Directors of the Company (the "***Board of Directors***") is hereby expressly authorized to provide for the issue of any or all of the unissued and undesignated shares of the Preferred Stock in one or more series, and to fix the number of shares and to determine or alter for each such series, such voting powers, full or limited, or no voting powers, and such designation, preferences, and relative, participating, optional, or other rights and such qualifications, limitations, or restrictions thereof, as shall be stated and expressed in the resolution or resolutions adopted by the Board of Directors providing for the issuance of such shares and as may be

permitted by the DGCL. The Board of Directors is also expressly authorized to increase or decrease the number of shares of any series subsequent to the issuance of shares of that series, but not below the number of shares of such series then outstanding. In case the number of shares of any series shall be decreased in accordance with the foregoing sentence, the shares constituting such decrease shall resume the status that they had prior to the adoption of the resolution originally fixing the number of shares of such series. The number of authorized shares of Preferred Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the voting power of the stock of the Company entitled to vote thereon, without a separate vote of the holders of the Preferred Stock, or of any series thereof, unless a vote of any such holders is required pursuant to the terms of any certificate of designation filed with respect to any series of Preferred Stock.

C. Each outstanding share of Common Stock shall entitle the holder thereof to one vote on each matter properly submitted to the stockholders of the Company for their vote; *provided, however*, that, except as otherwise required by law, holders of Common Stock shall not be entitled to vote on any amendment to this Amended and Restated Certificate of Incorporation (this "***Certificate of Incorporation***") (including any certificate of designation filed with respect to any series of Preferred Stock) that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series of Preferred Stock are entitled, either separately or together as a class with the holders of one or more other series of Preferred Stock, to vote thereon by law or pursuant to this Certificate of Incorporation (including any certificate of designation filed with respect to any series of Preferred Stock).

V.

For the management of the business and for the conduct of the affairs of the Company, and in further definition, limitation and regulation of the powers of the Company, of its directors and of its stockholders or any class thereof, as the case may be, it is further provided that:

A. The management of the business and the conduct of the affairs of the Company shall be vested in its Board of Directors. The number of directors that shall constitute the Board of Directors shall be fixed exclusively by resolutions adopted by a majority of the authorized number of directors constituting the Board of Directors.

B. Subject to the rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, the directors shall be divided into three classes designated as Class I, Class II and Class III, respectively. The Board of Directors is authorized to assign members of the Board of Directors already in office to such classes at the time the classification becomes effective. At the first annual meeting of stockholders following the initial classification of the Board of Directors, the term of office of the Class I directors shall expire and Class I directors shall be elected for a full term of three years. At the second annual meeting of stockholders following such initial classification, the term of office of the Class II directors shall expire and Class II directors shall be elected for a full term of three years. At the third annual meeting of stockholders following such initial classification, the term of office of the Class III directors shall expire and Class III directors shall be elected for a full term of three years. At each succeeding annual meeting of stockholders, directors shall be elected for a full

term of three years to succeed the directors of the class whose terms expire at such annual meeting.

Notwithstanding the foregoing provisions of this section, each director shall serve until his or her successor is duly elected and qualified or until his or her death, resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director.

C. Subject to the rights of any series of Preferred Stock that may be designated from time to time to elect additional directors under specified circumstances, neither the Board of Directors nor any individual director may be removed without cause. Subject to any limitation imposed by law, any individual director or directors may be removed with cause by the affirmative vote of the holders of at least 66 2/3% of the voting power of all then-outstanding shares of capital stock of the Company entitled to vote generally at an election of directors, voting together as a single class.

D. Subject to the rights of the holders of any series of Preferred Stock that may be designated from time to time, any vacancies on the Board of Directors resulting from death, resignation, disqualification, removal or other causes and any newly created directorships resulting from any increase in the number of directors, shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by the stockholders, except as otherwise provided by law, be filled only by the affirmative vote of a majority of the directors then in office, even though less than a quorum of the Board of Directors, and not by the stockholders. Any director elected in accordance with the preceding sentence shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been elected and qualified.

E. Subject to the rights of the holders of any series of Preferred Stock that may be designated from time to time, the Board of Directors is expressly empowered to adopt, amend or repeal the Amended and Restated Bylaws of the Company (the "***Bylaws***"). Any adoption, amendment or repeal of the Bylaws by the Board of Directors shall require the approval of a majority of the authorized number of directors. The stockholders shall also have power to adopt, amend or repeal the Bylaws, subject to any restrictions which may be set forth in this Certificate of Incorporation (including any certificate of designation that may be filed from time to time); *provided, however,* that, in addition to any vote of the holders of any class or series of stock of the Company required by law or by this Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least 66 2/3% of the voting power of all of the then-outstanding shares of the capital stock of the Company entitled to vote generally at an election of directors, voting together as a single class.

F. The directors of the Company need not be elected by written ballot unless the Bylaws so provide.

G. No action shall be taken by the stockholders of the Company except at an annual or special meeting of stockholders called in accordance with the Bylaws. No action shall be taken by the stockholders of the Company by written consent or electronic transmission.

H. Advance notice of stockholder nominations for the election of directors and of business to be brought by stockholders before any meeting of the stockholders of the Company shall be given in the manner provided in the Bylaws.

VI.

A. The liability of a director of the Company for monetary damages shall be eliminated to the fullest extent under applicable law. If the DGCL is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Company shall be eliminated to the fullest extent permitted by the DGCL, as so amended.

B. Any repeal or modification of this Article VI shall be prospective and shall not affect the rights under this Article VI in effect at the time of the alleged occurrence of any act or omission to act giving rise to liability or indemnification.

VII.

A. The Company reserves the right to amend, alter, change or repeal any provision contained in this Certificate of Incorporation, in the manner now or hereafter prescribed by statute, except as provided in Section B of this Article VII, and all rights conferred upon the stockholders herein are granted subject to this reservation.

B. Notwithstanding any other provisions of this Certificate of Incorporation or any provision of law which might otherwise permit a lesser vote or no vote, but in addition to any affirmative vote of the holders of any particular class or series of the Company required by law or by this Certificate of Incorporation or any certificate of designation filed with respect to a series of Preferred Stock that may be designated from time to time, subject to the rights of the holders of any series of Preferred Stock, the affirmative vote of the holders of at least 66 2/3% of the voting power of all of the then-outstanding shares of capital stock of the Company entitled to vote generally at an election of directors, voting together as a single class, shall be required to alter, amend or repeal Articles V, VI or VII of this Certificate of Incorporation.

* * * *

FOURTH: This Certificate of Incorporation has been duly adopted and approved by the Board of Directors.

FIFTH: This Certificate of Incorporation has been duly adopted and approved by written consent of the stockholders in accordance with sections 228, 242 and 245 of the DGCL and written notice of such action has been given as provided in section 228 of the DGCL.

IN WITNESS WHEREOF, Celladon Corporation has caused this Amended and Restated Certificate of Incorporation to be signed by its President and Chief Executive Officer this ____ day of _____, 2013.

CELLADON CORPORATION

KRISZTINA M. ZSEBO, PH.D.
President and Chief Executive Officer

BYLAWS

OF

CELLADON CORPORATION
(A DELAWARE CORPORATION)

BYLAWS

OF

CELLADON CORPORATION
(A DELAWARE CORPORATION)

ARTICLE I

OFFICES

Section 1. Registered Office. The registered office of the corporation in the State of Delaware shall be in the City of Wilmington, County of New Castle.

Section 2. Other Offices. The corporation shall also have and maintain an office or principal place of business at such place as may be fixed by the Board of Directors, and may also have offices at such other places, both within and without the State of Delaware, as the Board of Directors may from time to time determine or the business of the corporation may require.

ARTICLE II

CORPORATE SEAL

Section 3. Corporate Seal. The Board of Directors may adopt a corporate seal. The corporate seal shall consist of a die bearing the name of the corporation and the inscription, "Corporate Seal-Delaware." Said seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE III

STOCKHOLDERS' MEETINGS

Section 4. Place of Meetings. Meetings of the stockholders of the corporation may be held at such place, either within or without the State of Delaware, as may be determined from time to time by the Board of Directors. The Board of Directors may, in its sole discretion, determine that the meeting shall not be held at any place, but may instead be held solely by means of remote communication as provided under the Delaware General Corporation Law ("DGCL").

Section 5. Annual Meeting.

(a) The annual meeting of the stockholders of the corporation, for the purpose of election of directors and for such other business as may lawfully come before it, shall be held on such date and at such time as may be designated from time to time by the Board of Directors. Nominations of persons for election to the Board of Directors of the corporation and the proposal of business to be considered by the stockholders may be made at an annual meeting of

stockholders: (i) pursuant to the corporation's notice of meeting of stockholders; (ii) by or at the direction of the Board of Directors; or (iii) by any stockholder of the corporation who was a stockholder of record at the time of giving of notice provided for in the following paragraph, who is entitled to vote at the meeting and who complied with the notice procedures set forth in Section 5.

(b) At an annual meeting of the stockholders, only such business shall be conducted as shall have been properly brought before the meeting. For nominations or other business to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Bylaws, (i) the stockholder must have given timely notice thereof in writing to the Secretary of the corporation, (ii) such other business must be a proper matter for stockholder action under the DGCL, (iii) if the stockholder, or the beneficial owner on whose behalf any such proposal or nomination is made, has provided the corporation with a Solicitation Notice (as defined in this Section 5(b)), such stockholder or beneficial owner must, in the case of a proposal, have delivered a proxy statement and form of proxy to holders of at least the percentage of the corporation's voting shares required under applicable law to carry any such proposal, or, in the case of a nomination or nominations, have delivered a proxy statement and form of proxy to holders of a percentage of the corporation's voting shares reasonably believed by such stockholder or beneficial owner to be sufficient to elect the nominee or nominees proposed to be nominated by such stockholder, and must, in either case, have included in such materials the Solicitation Notice, and (iv) if no Solicitation Notice relating thereto has been timely provided pursuant to this section, the stockholder or beneficial owner proposing such business or nomination must not have solicited a number of proxies sufficient to have required the delivery of such a Solicitation Notice under this Section 5. To be timely, a stockholder's notice shall be delivered to the Secretary at the principal executive offices of the corporation not later than the close of business on the ninetieth (90th) day nor earlier than the close of business on the one hundred twentieth (120th) day prior to the first anniversary of the preceding year's annual meeting; provided, however, that in the event that the date of the annual meeting is advanced more than thirty (30) days prior to or delayed by more than thirty (30) days after the anniversary of the preceding year's annual meeting, notice by the stockholder to be timely must be so delivered not earlier than the close of business on the one hundred twentieth (120th) day prior to such annual meeting and not later than the close of business on the later of the ninetieth (90th) day prior to such annual meeting or the tenth (10th) day following the day on which public announcement of the date of such meeting is first made. In no event shall the public announcement of an adjournment of an annual meeting commence a new time period for the giving of a stockholder's notice as described above. Such stockholder's notice shall set forth: (A) as to each person whom the stockholder proposed to nominate for election or reelection as a director all information relating to such person that is required to be disclosed in solicitations of proxies for election of directors in an election contest, or is otherwise required, in each case pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (the "1934 Act") and Rule 14a-4(d) thereunder (including such person's written consent to being named in the proxy statement as a nominee and to serving as a director if elected); (B) as to any other business that the stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the reasons for conducting such business at the meeting and any material interest in such business of such stockholder and the beneficial owner, if any, on whose behalf the proposal is made; and (C) as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the nomination or proposal is made (i)

the name and address of such stockholder, as they appear on the corporation's books, and of such beneficial owner, (ii) the class and number of shares of the corporation which are owned beneficially and of record by such stockholder and such beneficial owner, and (iii) whether either such stockholder or beneficial owner intends to deliver a proxy statement and form of proxy to holders of, in the case of the proposal, at least the percentage of the corporation's voting shares required under applicable law to carry the proposal or, in the case of a nomination or nominations, a sufficient number of holders of the corporation's voting shares to elect such nominee or nominees (an affirmative statement of such intent, a "Solicitation Notice").

(c) Notwithstanding anything in the second sentence of Section 5(b) of these Bylaws to the contrary, in the event that the number of directors to be elected to the Board of Directors of the corporation is increased and there is no public announcement naming all of the nominees for director or specifying the size of the increased Board of Directors made by the corporation at least one hundred (100) days prior to the first anniversary of the preceding year's annual meeting, a stockholder's notice required by this Section 5 shall also be considered timely, but only with respect to nominees for any new positions created by such increase, if it shall be delivered to the Secretary at the principal executive offices of the corporation not later than the close of business on the tenth (10^{th}) day following the day on which such public announcement is first made by the corporation.

(d) Only such persons who are nominated in accordance with the procedures set forth in this Section 5 shall be eligible to serve as directors and only such business shall be conducted at a meeting of stockholders as shall have been brought before the meeting in accordance with the procedures set forth in this Section 5. Except as otherwise provided by law, the Chair of the meeting shall have the power and duty to determine whether a nomination or any business proposed to be brought before the meeting was made, or proposed, as the case may be, in accordance with the procedures set forth in these Bylaws and, if any proposed nomination or business is not in compliance with these Bylaws, to declare that such defective proposal or nomination shall not be presented for stockholder action at the meeting and shall be disregarded.

(e) Notwithstanding the foregoing provisions of this Section 5, in order to include information with respect to a stockholder proposal in the proxy statement and form of proxy for a stockholders' meeting, stockholders must provide notice as required by the regulations promulgated under the 1934 Act. Nothing in these Bylaws shall be deemed to affect any rights of stockholders to request inclusion of proposals in the corporation proxy statement pursuant to Rule 14a-8 under the 1934 Act.

(f) For purposes of this Section 5, "public announcement" shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the 1934 Act.

Section 6. Special Meetings.

(a) Special meetings of the stockholders of the corporation may be called, for any purpose or purposes, by (i) the Chair of the Board of Directors, (ii) the Chief Executive Officer, (iii) the Board of Directors pursuant to a resolution adopted by a majority of the total

number of authorized directors (whether or not there exist any vacancies in previously authorized directorships at the time any such resolution is presented to the Board of Directors for adoption) or (iv) by the holders of shares entitled to cast not less than ten percent (10%) of the votes at the meeting, and shall be held at such place, on such date, and at such time as the Board of Directors shall fix.

At any time or times that the corporation is subject to Section 2115(b) of the California General Corporation Law ("CGCL"), stockholders holding five percent (5%) or more of the outstanding shares shall have the right to call a special meeting of stockholders as set forth in Section 18(b) herein.

(b) If a special meeting is properly called by any person or persons other than the Board of Directors, the request shall be in writing, specifying the general nature of the business proposed to be transacted, and shall be delivered personally or sent by certified or registered mail, return receipt requested, or by telegraphic or other facsimile transmission to the Chair of the Board of Directors, the Chief Executive Officer, any vice-president or the Secretary of the corporation. No business may be transacted at such special meeting otherwise than specified in such notice. The Board of Directors shall determine the time and place of such special meeting, which shall be held not less than thirty-five (35) nor more than one hundred twenty (120) days after the date of the receipt of the request. Upon determination of the time and place of the meeting, the officer receiving the request shall cause notice to be given to the stockholders entitled to vote, in accordance with the provisions of Section 7 of these Bylaws. Nothing contained in this paragraph (b) shall be construed as limiting, fixing, or affecting the time when a meeting of stockholders called by action of the Board of Directors may be held.

Section 7. Notice of Meetings. Except as otherwise provided by law, notice, given in writing or by electronic transmission, of each meeting of stockholders shall be given not less than ten (10) nor more than sixty (60) days before the date of the meeting to each stockholder entitled to vote at such meeting, such notice to specify the place, if any, date and hour, in the case of special meetings, the purpose or purposes of the meeting, and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at any such meeting. If mailed, notice is given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the corporation. Notice of the time, place, if any, and purpose of any meeting of stockholders may be waived in writing, signed by the person entitled to notice thereof or by electronic transmission by such person, either before or after such meeting, and will be waived by any stockholder by his attendance thereat in person, by remote communication, if applicable, or by proxy, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Any stockholder so waiving notice of such meeting shall be bound by the proceedings of any such meeting in all respects as if due notice thereof had been given.

Section 8. Quorum. At all meetings of stockholders, except where otherwise provided by statute or by the Certificate of Incorporation, or by these Bylaws, the presence, in person, by remote communication, if applicable, or by proxy duly authorized, of the holders of a majority of the outstanding shares of stock entitled to vote shall constitute a quorum for the

transaction of business. In the absence of a quorum, any meeting of stockholders may be adjourned, from time to time, either by the chairman of the meeting or by vote of the holders of a majority of the shares represented thereat, but no other business shall be transacted at such meeting. The stockholders present at a duly called or convened meeting, at which a quorum is present, may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum. Except as otherwise provided by statute, or by the Certificate of Incorporation or these Bylaws, in all matters other than the election of directors, the affirmative vote of a majority of shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders. Except as otherwise provided by statute, the Certificate of Incorporation or these Bylaws, directors shall be elected by a plurality of the votes of the shares present in person, by remote communication, if applicable, or represented by proxy duly authorized at the meeting and entitled to vote generally on the election of directors. Where a separate vote by a class or classes or series is required, except where otherwise provided by the statute or by the Certificate of Incorporation or these Bylaws, a majority of the outstanding shares of such class or classes or series, present in person, by remote communication, if applicable, or represented by proxy duly authorized, shall constitute a quorum entitled to take action with respect to that vote on that matter. Except where otherwise provided by statute or by the Certificate of Incorporation or these Bylaws, the affirmative vote of the majority (plurality, in the case of the election of directors) of shares of such class or classes or series present in person, by remote communication, if applicable, or represented by proxy at the meeting shall be the act of such class or classes or series.

Section 9. Adjournment and Notice of Adjourned Meetings. Any meeting of stockholders, whether annual or special, may be adjourned from time to time either by the chairman of the meeting or by the vote of a majority of the shares present in person, by remote communication, if applicable, or represented by proxy. When a meeting is adjourned to another time or place, if any, notice need not be given of the adjourned meeting if the time and place, if any, thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than forty-five (45) days or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

Section 10. Voting Rights. For the purpose of determining those stockholders entitled to vote at any meeting of the stockholders, except as otherwise provided by law, only persons in whose names shares stand on the stock records of the corporation on the record date, as provided in Section 12 of these Bylaws, shall be entitled to vote at any meeting of stockholders. Every person entitled to vote or execute consents shall have the right to do so either in person, by remote communication, if applicable, or by an agent or agents authorized by a proxy granted in accordance with Delaware law. An agent so appointed need not be a stockholder. No proxy shall be voted after three (3) years from its date of creation unless the proxy provides for a longer period.

Section 11. Joint Owners of Stock. If shares or other securities having voting power stand of record in the names of two (2) or more persons, whether fiduciaries, members of a partnership, joint tenants, tenants in common, tenants by the entirety, or otherwise, or if two (2)

or more persons have the same fiduciary relationship respecting the same shares, unless the Secretary is given written notice to the contrary and is furnished with a copy of the instrument or order appointing them or creating the relationship wherein it is so provided, their acts with respect to voting shall have the following effect: (a) if only one (1) votes, his act binds all; (b) if more than one (1) votes, the act of the majority so voting binds all; (c) if more than one (1) votes, but the vote is evenly split on any particular matter, each faction may vote the securities in question proportionally, or may apply to the Delaware Court of Chancery for relief as provided in the DGCL, Section 217(b). If the instrument filed with the Secretary shows that any such tenancy is held in unequal interests, a majority or even-split for the purpose of subsection (c) shall be a majority or even-split in interest.

Section 12. List of Stockholders. The Secretary shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at said meeting, arranged in alphabetical order, showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or during ordinary business hours, at the principal place of business of the corporation. In the event that the corporation determines to make the list available on an electronic network, the corporation may take reasonable steps to ensure that such information is available only to stockholders of the corporation. The list shall be open to examination of any stockholder during the time of the meeting as provided by law.

Section 13. Action Without Meeting.

(a) Unless otherwise provided in the Certificate of Incorporation, any action required by statute to be taken at any annual or special meeting of the stockholders, or any action which may be taken at any annual or special meeting of the stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent in writing, or by electronic transmission setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted.

(b) Every written consent or electronic transmission shall bear the date of signature of each stockholder who signs the consent, and no written consent or electronic transmission shall be effective to take the corporate action referred to therein unless, within sixty (60) days of the earliest dated consent delivered to the corporation in the manner herein required, written consents or electronic transmissions signed by a sufficient number of stockholders to take action are delivered to the corporation by delivery to its registered office in the State of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation’s registered office shall be by hand or by certified or registered mail, return receipt requested.

(c) Prompt notice of the taking of the corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing or by electronic transmission and who, if the action had been taken at a meeting,

would have been entitled to notice of the meeting if the record date for such meeting had been the date that written consents signed by a sufficient number of stockholders to take action were delivered to the corporation as provided in Section 228(c) of the DGCL. If the action which is consented to is such as would have required the filing of a certificate under any section of the DGCL if such action had been voted on by stockholders at a meeting thereof, then the certificate filed under such section shall state, in lieu of any statement required by such section concerning any vote of stockholders, that written consent has been given in accordance with Section 228 of the DGCL.

(d) A telegram, cablegram or other electronic transmission consenting to an action to be taken and transmitted by a stockholder or proxyholder, shall be deemed to be written, signed and dated for the purposes of this section, provided that any such telegram, cablegram or other electronic transmission sets forth or is delivered with information from which the corporation can determine (i) that the telegram, cablegram or other electronic transmission was transmitted by the stockholder or proxyholder or by a person or persons authorized to act for the stockholder and (ii) the date on which such stockholder or proxyholder or authorized person or persons transmitted such telegram, cablegram or electronic transmission. The date on which such telegram, cablegram or electronic transmission is transmitted shall be deemed to be the date on which such consent was signed. No consent given by telegram, cablegram or other electronic transmission shall be deemed to have been delivered until such consent is reproduced in paper form and until such paper form shall be delivered to the corporation by delivery to its registered office in the state of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be made by hand or by certified or registered mail, return receipt requested. Notwithstanding the foregoing limitations on delivery, consents given by telegram, cablegram or other electronic transmission may be otherwise delivered to the principal place of business of the corporation or to an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded if, to the extent and in the manner provided by resolution of the board of directors of the corporation. Any copy, facsimile or other reliable reproduction of a consent in writing may be substituted or used in lieu of the original writing for any and all purposes for which the original writing could be used, provided that such copy, facsimile or other reproduction shall be a complete reproduction of the entire original writing.

Section 14. Organization.

(a) At every meeting of stockholders, the Chair of the Board of Directors, or, if a Chair has not been appointed or is absent, the President, or, if the President is absent, a chairman of the meeting chosen by a majority in interest of the stockholders entitled to vote, present in person or by proxy, shall act as chairman. The Secretary, or, in his absence, an Assistant Secretary directed to do so by the President, shall act as secretary of the meeting.

(b) The Board of Directors of the corporation shall be entitled to make such rules or regulations for the conduct of meetings of stockholders as it shall deem necessary, appropriate or convenient. Subject to such rules and regulations of the Board of Directors, if any, the chairman of the meeting shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are

necessary, appropriate or convenient for the proper conduct of the meeting, including, without limitation, establishing an agenda or order of business for the meeting, rules and procedures for maintaining order at the meeting and the safety of those present, limitations on participation in such meeting to stockholders of record of the corporation and their duly authorized and constituted proxies and such other persons as the chairman shall permit, restrictions on entry to the meeting after the time fixed for the commencement thereof, limitations on the time allotted to questions or comments by participants and regulation of the opening and closing of the polls for balloting on matters which are to be voted on by ballot. The date and time of the opening and closing of the polls for each matter upon which the stockholders will vote at the meeting shall be announced at the meeting. Unless and to the extent determined by the Board of Directors or the chairman of the meeting, meetings of stockholders shall not be required to be held in accordance with rules of parliamentary procedure.

ARTICLE IV

DIRECTORS

Section 15. Number and Term of Office.

The authorized number of directors of the corporation shall be fixed by the Board of Directors from time to time. Directors need not be stockholders unless so required by the Certificate of Incorporation. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient.

Section 16. Powers. The business and affairs of the corporation shall be managed by or under the direction of the Board of Directors, except as may be otherwise provided by statute or by the Certificate of Incorporation.

Section 17. Term of Directors.

(a) Subject to the rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, directors shall be elected at each annual meeting of stockholders to serve until the next annual meeting of stockholders and his successor is duly elected and qualified or until his death, resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director.

(b) No person entitled to vote at an election for directors may cumulate votes to which such person is entitled, unless, at the time of such election, the corporation is subject to Section 2115(b) of the CGCL. During such time or times that the corporation is subject to Section 2115(b) of the CGCL, every stockholder entitled to vote at an election for directors may cumulate such stockholder’s votes and give one candidate a number of votes equal to the number of directors to be elected multiplied by the number of votes to which such stockholder’s shares are otherwise entitled, or distribute the stockholder’s votes on the same principle among as many candidates as such stockholder thinks fit. No stockholder, however, shall be entitled to so cumulate such stockholder’s votes unless (i) the names of such candidate or candidates have been placed in nomination prior to the voting and (ii) the stockholder has given notice at the

meeting, prior to the voting, of such stockholder's intention to cumulate such stockholder's votes. If any stockholder has given proper notice to cumulate votes, all stockholders may cumulate their votes for any candidates who have been properly placed in nomination. Under cumulative voting, the candidates receiving the highest number of votes, up to the number of directors to be elected, are elected.

Section 18. Vacancies.

(a) Unless otherwise provided in the Certificate of Incorporation, and subject to the rights of the holders of any series of Preferred Stock, any vacancies on the Board of Directors resulting from death, resignation, disqualification, removal or other causes and any newly created directorships resulting from any increase in the number of directors shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled only by the affirmative vote of a majority of the directors then in office, even though less than a quorum of the Board of Directors, or by a sole remaining director, *provided*, *however*, that whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected. Any director elected in accordance with the preceding sentence shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been elected and qualified. A vacancy in the Board of Directors shall be deemed to exist under this Bylaw in the case of the death, removal or resignation of any director.

(b) At any time or times that the corporation is subject to §2115(b) of the CGCL, if, after the filling of any vacancy, the directors then in office who have been elected by stockholders shall constitute less than a majority of the directors then in office, then

(i) any holder or holders of an aggregate of five percent (5%) or more of the total number of shares at the time outstanding having the right to vote for those directors may call a special meeting of stockholders; or

(ii) the Superior Court of the proper county shall, upon application of such stockholder or stockholders, summarily order a special meeting of the stockholders, to be held to elect the entire board, all in accordance with Section 305(c) of the CGCL, the term of office of any director shall terminate upon that election of a successor.

Section 19. Resignation. Any director may resign at any time by delivering his or her notice in writing or by electronic transmission to the Secretary, such resignation to specify whether it will be effective at a particular time, upon receipt by the Secretary or at the pleasure of the Board of Directors. If no such specification is made, it shall be deemed effective at the pleasure of the Board of Directors. When one or more directors shall resign from the Board of Directors, effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to

take effect when such resignation or resignations shall become effective, and each Director so chosen shall hold office for the unexpired portion of the term of the Director whose place shall be vacated and until his successor shall have been duly elected and qualified.

Section 20. Removal.

(a) Subject to any limitations imposed by applicable law (and assuming the corporation is not subject to Section 2115 of the CGCL), the Board of Directors or any director may be removed from office at any time (i) with cause by the affirmative vote of the holders of a majority of the voting power of all then-outstanding shares of capital stock of the corporation entitled to vote generally at an election of directors or (ii) without cause by the affirmative vote of the holders of a majority of the voting power of all then-outstanding shares of capital stock of the corporation, entitled to elect such director.

(b) During such time or times that the corporation is subject to Section 2115(b) of the CGCL, the Board of Directors or any individual director may be removed from office at any time without cause by the affirmative vote of the holders of at least a majority of the outstanding shares entitled to vote on such removal; provided, however, that unless the entire Board is removed, no individual director may be removed when the votes cast against such director's removal, or not consenting in writing to such removal, would be sufficient to elect that director if voted cumulatively at an election which the same total number of votes were cast (or, if such action is taken by written consent, all shares entitled to vote were voted) and the entire number of directors authorized at the time of such director's most recent election were then being elected.

Section 21. Meetings

(a) Regular Meetings. Unless otherwise restricted by the Certificate of Incorporation, regular meetings of the Board of Directors may be held at any time or date and at any place within or without the State of Delaware which has been designated by the Board of Directors and publicized among all directors, either orally or in writing, including a voice-messaging system or other system designated to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means. No further notice shall be required for a regular meeting of the Board of Directors.

(b) Special Meetings. Unless otherwise restricted by the Certificate of Incorporation, special meetings of the Board of Directors may be held at any time and place within or without the State of Delaware whenever called by the Chair of the Board, the President or any two directors.

(c) Meetings by Electronic Communications Equipment. Any member of the Board of Directors, or of any committee thereof, may participate in a meeting by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting by such means shall constitute presence in person at such meeting.

(d) Notice of Special Meetings. Notice of the time and place of all special meetings of the Board of Directors shall be orally or in writing, by telephone, including a voice

messaging system or other system or technology designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means, during normal business hours, at least twenty-four (24) hours before the date and time of the meeting. If notice is sent by US mail, it shall be sent by first class mail, postage prepaid at least three (3) days before the date of the meeting. Notice of any meeting may be waived in writing or by electronic transmission at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

(e) Waiver of Notice. The transaction of all business at any meeting of the Board of Directors, or any committee thereof, however called or noticed, or wherever held, shall be as valid as though had at a meeting duly held after regular call and notice, if a quorum be present and if, either before or after the meeting, each of the directors not present who did not receive notice shall sign a written waiver of notice or shall waive notice by electronic transmission. All such waivers shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 22. Quorum and Voting.

(a) Unless the Certificate of Incorporation requires a greater number, a quorum of the Board of Directors shall consist of a majority of the exact number of directors fixed from time to time by the Board of Directors in accordance with the Certificate of Incorporation; *provided*, *however*, at any meeting, whether a quorum be present or otherwise, a majority of the directors present may adjourn from time to time until the time fixed for the next regular meeting of the Board of Directors, without notice other than by announcement at the meeting.

(b) At each meeting of the Board of Directors at which a quorum is present, all questions and business shall be determined by the affirmative vote of a majority of the directors present, unless a different vote be required by law, the Certificate of Incorporation or these Bylaws.

Section 23. Action Without Meeting. Unless otherwise restricted by the Certificate of Incorporation or these Bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent thereto in writing or by electronic transmission, and such writing or writings or transmission or transmissions are filed with the minutes of proceedings of the Board of Directors or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 24. Fees and Compensation. Directors shall be entitled to such compensation for their services as may be approved by the Board of Directors, including, if so approved, by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, for attendance at each regular or special meeting of the Board of Directors and at any meeting of a committee of the Board of Directors. Nothing herein contained shall be construed

to preclude any director from serving the corporation in any other capacity as an officer, agent, employee, or otherwise and receiving compensation therefor.

Section 25. Committees.

(a) Executive Committee. The Board of Directors may appoint an Executive Committee to consist of two (2) or more members of the Board of Directors. The Executive Committee, to the extent permitted by law and provided in the resolution of the Board of Directors shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation, and may authorize the seal of the corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to (i) approving or adopting, or recommending to the stockholders, any action or matter expressly required by the DGCL to be submitted to stockholders for approval, or (ii) adopting, amending or repealing any bylaw of the corporation.

(b) Other Committees. The Board of Directors may, from time to time, appoint such other committees as may be permitted by law. Such other committees appointed by the Board of Directors shall consist of one (1) or more members of the Board of Directors and shall have such powers and perform such duties as may be prescribed by the resolution or resolutions creating such committees, but in no event shall any such committee have the powers denied to the Executive Committee in these Bylaws.

(c) Term. The Board of Directors, subject to any requirements of any outstanding series of Preferred Stock and the provisions of subsections (a) or (b) of this Bylaw may at any time increase or decrease the number of members of a committee or terminate the existence of a committee. The membership of a committee member shall terminate on the date of his death or voluntary resignation from the committee or from the Board of Directors. The Board of Directors may at any time for any reason remove any individual committee member and the Board of Directors may fill any committee vacancy created by death, resignation, removal or increase in the number of members of the committee. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee, and, in addition, in the absence or disqualification of any member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not he or they constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member.

(d) Meetings. Unless the Board of Directors shall otherwise provide, regular meetings of the Executive Committee or any other committee appointed pursuant to this Section 25 shall be held at such times and places as are determined by the Board of Directors, or by any such committee, and when notice thereof has been given to each member of such committee, no further notice of such regular meetings need be given thereafter. Special meetings of any such committee may be held at any place which has been determined from time to time by such committee, and may be called by any director who is a member of such committee, upon notice to the members of such committee of the time and place of such special meeting given in the manner provided for the giving of notice to members of the Board of Directors of the time and place of special meetings of the Board of Directors. Notice of any special meeting of any

committee may be waived in writing at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends such special meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Unless otherwise provided by the Board of Directors in the resolutions authorizing the creation of the committee, a majority of the authorized number of members of any such committee shall constitute a quorum for the transaction of business, and the act of a majority of those present at any meeting at which a quorum is present shall be the act of such committee.

Section 26. Organization. At every meeting of the directors, the Chair of the Board of Directors, or, if a Chair has not been appointed or is absent, the President, or if the President is absent, the most senior Vice President, (if a director) or, in the absence of any such person, a chairman of the meeting chosen by a majority of the directors present, shall preside over the meeting. The Secretary, or in his absence, any Assistant Secretary directed to do so by the President, shall act as secretary of the meeting.

ARTICLE V

OFFICERS

Section 27. Officers Designated. The officers of the corporation shall include, if and when designated by the Board of Directors, the Chief Executive Officer, the President, one or more Vice Presidents, the Secretary, the Chief Financial Officer, the Treasurer and the Controller, all of whom shall be elected at the annual organizational meeting of the Board of Directors. The Board of Directors may also appoint one or more Assistant Secretaries, Assistant Treasurers, Assistant Controllers and such other officers and agents with such powers and duties as it shall deem necessary. The Board of Directors may assign such additional titles to one or more of the officers as it shall deem appropriate. Any one person may hold any number of offices of the corporation at any one time unless specifically prohibited therefrom by law. The salaries and other compensation of the officers of the corporation shall be fixed by or in the manner designated by the Board of Directors.

Section 28. Tenure and Duties of Officers.

(a) General. All officers shall hold office at the pleasure of the Board of Directors and until their successors shall have been duly elected and qualified, unless sooner removed. Any officer elected or appointed by the Board of Directors may be removed at any time by the Board of Directors. If the office of any officer becomes vacant for any reason, the vacancy may be filled by the Board of Directors.

(b) Duties of Chair of the Board of Directors. The Chair of the Board of Directors, when present, shall preside at all meetings of the stockholders and the Board of Directors. The Chair of the Board of Directors shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time. If there is no President, then the Chair of the Board of Directors shall also serve as the Chief Executive Officer of the corporation and shall have the powers and duties prescribed in paragraph (c) of this Section 28.

(c) Duties of President. The President shall preside at all meetings of the stockholders and at all meetings of the Board of Directors, unless the Chair of the Board of Directors has been appointed and is present. Unless some other officer has been elected Chief Executive Officer of the corporation, the President shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. The President shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time.

(d) Duties of Vice Presidents. The Vice Presidents may assume and perform the duties of the President in the absence or disability of the President or whenever the office of President is vacant. The Vice Presidents shall perform other duties commonly incident to their office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

(e) Duties of Secretary. The Secretary shall attend all meetings of the stockholders and of the Board of Directors and shall record all acts and proceedings thereof in the minute book of the corporation. The Secretary shall give notice in conformity with these Bylaws of all meetings of the stockholders and of all meetings of the Board of Directors and any committee thereof requiring notice. The Secretary shall perform all other duties provided for in these Bylaws and other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors shall designate from time to time. The President may direct any Assistant Secretary to assume and perform the duties of the Secretary in the absence or disability of the Secretary, and each Assistant Secretary shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

(f) Duties of Chief Financial Officer. The Chief Financial Officer shall keep or cause to be kept the books of account of the corporation in a thorough and proper manner and shall render statements of the financial affairs of the corporation in such form and as often as required by the Board of Directors or the President. The Chief Financial Officer, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the corporation. The Chief Financial Officer shall perform other duties commonly incident to his office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time. The President may direct the Treasurer or any Assistant Treasurer, or the Controller or any Assistant Controller to assume and perform the duties of the Chief Financial Officer in the absence or disability of the Chief Financial Officer, and each Treasurer and Assistant Treasurer and each Controller and Assistant Controller shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

Section 29. Delegation of Authority. The Board of Directors may from time to time delegate the powers or duties of any officer to any other officer or agent, notwithstanding any provision hereof.

Section 30. Resignations. Any officer may resign at any time by giving notice in writing or by electronic transmission notice to the Board of Directors or to the President or to the Secretary. Any such resignation shall be effective when received by the person or persons to whom such notice is given, unless a later time is specified therein, in which event the resignation shall become effective at such later time. Unless otherwise specified in such notice, the acceptance of any such resignation shall not be necessary to make it effective. Any resignation shall be without prejudice to the rights, if any, of the corporation under any contract with the resigning officer.

Section 31. Removal. Any officer may be removed from office at any time, either with or without cause, by the affirmative vote of a majority of the directors in office at the time, or by the unanimous written or electronic consent of the directors in office at the time, or by any committee or superior officers.

ARTICLE VI

EXECUTION OF CORPORATE INSTRUMENTS AND VOTING OF SECURITIES OWNED BY THE CORPORATION

Section 32. Execution of Corporate Instruments. The Board of Directors may, in its discretion, determine the method and designate the signatory officer or officers, or other person or persons, to execute on behalf of the corporation any corporate instrument or document, or to sign on behalf of the corporation the corporate name without limitation, or to enter into contracts on behalf of the corporation, except where otherwise provided by law or these Bylaws, and such execution or signature shall be binding upon the corporation.

All checks and drafts drawn on banks or other depositaries on funds to the credit of the corporation or in special accounts of the corporation shall be signed by such person or persons as the Board of Directors shall authorize so to do.

Unless authorized or ratified by the Board of Directors or within the agency power of an officer, no officer, agent or employee shall have any power or authority to bind the corporation by any contract or engagement or to pledge its credit or to render it liable for any purpose or for any amount.

Section 33. Voting of Securities Owned by the Corporation. All stock and other securities of other corporations owned or held by the corporation for itself, or for other parties in any capacity, shall be voted, and all proxies with respect thereto shall be executed, by the person authorized so to do by resolution of the Board of Directors, or, in the absence of such authorization, by the Chair of the Board of Directors, the Chief Executive Officer, the President, or any Vice President.

ARTICLE VII

SHARES OF STOCK

Section 34. Form and Execution of Certificates. The shares of the corporation shall be represented by certificates, or shall be uncertificated. Certificates for the shares of stock, if

any, shall be in such form as is consistent with the Certificate of Incorporation and applicable law. Every holder of stock in the corporation represented by certificate shall be entitled to have a certificate signed by or in the name of the corporation by the Chair of the Board of Directors, or the President or any Vice President and by the Treasurer or Assistant Treasurer or the Secretary or Assistant Secretary, certifying the number of shares owned by him in the corporation. Any or all of the signatures on the certificate may be facsimiles. In case any officer, transfer agent, or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent, or registrar before such certificate is issued, it may be issued with the same effect as if he were such officer, transfer agent, or registrar at the date of issue.

Section 35. Lost Certificates. A new certificate or certificates shall be issued in place of any certificate or certificates theretofore issued by the corporation alleged to have been lost, stolen, or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost, stolen, or destroyed. The corporation may require, as a condition precedent to the issuance of a new certificate or certificates, the owner of such lost, stolen, or destroyed certificate or certificates, or the owner's legal representative, to agree to indemnify the corporation in such manner as it shall require or to give the corporation a surety bond in such form and amount as it may direct as indemnity against any claim that may be made against the corporation with respect to the certificate alleged to have been lost, stolen, or destroyed.

Section 36. Transfers.

(a) Transfers of record of shares of stock of the corporation shall be made only upon its books by the holders thereof, in person or by attorney duly authorized, and upon the surrender of a properly endorsed certificate or certificates for a like number of shares.

(b) The corporation shall have power to enter into and perform any agreement with any number of stockholders of any one or more classes of stock of the corporation to restrict the transfer of shares of stock of the corporation of any one or more classes owned by such stockholders in any manner not prohibited by the DGCL.

Section 37. Fixing Record Dates.

(a) In order that the corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which record date shall, subject to applicable law, not be more than sixty (60) nor less than ten (10) days before the date of such meeting. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided, however,* that the Board of Directors may fix a new record date for the adjourned meeting.

(b) In order that the corporation may determine the stockholders entitled to consent to corporate action in writing without a meeting, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which date shall not be more than ten (10) days after the date upon which the resolution fixing the record date is adopted by the Board of Directors. Any stockholder of record seeking to have the stockholders authorize or take corporate action by written consent shall, by written notice to the Secretary, request the Board of Directors to fix a record date. The Board of Directors shall promptly, but in all events within ten (10) days after the date on which such a request is received, adopt a resolution fixing the record date. If no record date has been fixed by the Board of Directors within ten (10) days of the date on which such a request is received, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is required by applicable law, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the corporation by delivery to its registered office in the State of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the corporation's registered office shall be by hand or by certified or registered mail, return receipt requested. If no record date has been fixed by the Board of Directors and prior action by the Board of Directors is required by law, the record date for determining stockholders entitled to consent to corporate action in writing without a meeting shall be at the close of business on the day on which the Board of Directors adopts the resolution taking such prior action.

(c) In order that the corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than sixty (60) days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

Section 38. Registered Stockholders. The corporation shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends, and to vote as such owner, and shall not be bound to recognize any equitable or other claim to or interest in such share or shares on the part of any other person whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

ARTICLE VIII

OTHER SECURITIES OF THE CORPORATION

Section 39. Execution of Other Securities. All bonds, debentures and other corporate securities of the corporation, other than stock certificates (covered in Section 34), may be signed by the Chair of the Board of Directors, the President or any Vice President, or such other person as may be authorized by the Board of Directors, and the corporate seal impressed

thereon or a facsimile of such seal imprinted thereon and attested by the signature of the Secretary or an Assistant Secretary, or the Chief Financial Officer or Treasurer or an Assistant Treasurer; *provided*, *however*, that where any such bond, debenture or other corporate security shall be authenticated by the manual signature, or where permissible facsimile signature, of a trustee under an indenture pursuant to which such bond, debenture or other corporate security shall be issued, the signatures of the persons signing and attesting the corporate seal on such bond, debenture or other corporate security may be the imprinted facsimile of the signatures of such persons. Interest coupons appertaining to any such bond, debenture or other corporate security, authenticated by a trustee as aforesaid, shall be signed by the Treasurer or an Assistant Treasurer of the corporation or such other person as may be authorized by the Board of Directors, or bear imprinted thereon the facsimile signature of such person. In case any officer who shall have signed or attested any bond, debenture or other corporate security, or whose facsimile signature shall appear thereon or on any such interest coupon, shall have ceased to be such officer before the bond, debenture or other corporate security so signed or attested shall have been delivered, such bond, debenture or other corporate security nevertheless may be adopted by the corporation and issued and delivered as though the person who signed the same or whose facsimile signature shall have been used thereon had not ceased to be such officer of the corporation.

ARTICLE IX

DIVIDENDS

Section 40. Declaration of Dividends. Dividends upon the capital stock of the corporation, subject to the provisions of the Certificate of Incorporation and applicable law, if any, may be declared by the Board of Directors pursuant to law at any regular or special meeting. Dividends may be paid in cash, in property, or in shares of the capital stock, subject to the provisions of the Certificate of Incorporation and applicable law.

Section 41. Dividend Reserve. Before payment of any dividend, there may be set aside out of any funds of the corporation available for dividends such sum or sums as the Board of Directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing dividends, or for repairing or maintaining any property of the corporation, or for such other purpose as the Board of Directors shall think conducive to the interests of the corporation, and the Board of Directors may modify or abolish any such reserve in the manner in which it was created.

ARTICLE X

FISCAL YEAR

Section 42. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the Board of Directors.

ARTICLE XI

INDEMNIFICATION

Section 43. Indemnification of Directors, Executive Officers, Other Officers, Employees and Other Agents.

(a) Directors and Officers. The corporation shall indemnify its directors and officers to the fullest extent not prohibited by the DGCL or any other applicable law; *provided, however,* that the corporation may modify the extent of such indemnification by individual contracts with its directors and officers; and, *provided, further,* that the corporation shall not be required to indemnify any director or officer in connection with any proceeding (or part thereof) initiated by such person unless (i) such indemnification is expressly required to be made by law, (ii) the proceeding was authorized by the Board of Directors of the corporation, (iii) such indemnification is provided by the corporation, in its sole discretion, pursuant to the powers vested in the corporation under the Delaware General Corporation Law or any other applicable law or (iv) such indemnification is required to be made under subsection (d).

(b) Employees and Other Agents. The corporation shall have power to indemnify its employees and other agents as set forth in the DGCL or any other applicable law. The Board of Directors shall have the power to delegate the determination of whether indemnification shall be given to any such person except officers to such other persons as the Board of Directors shall determine.

(c) Expenses. The corporation shall advance to any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a director or officer, of the corporation, or is or was serving at the request of the corporation as a director or officer of another corporation, partnership, joint venture, trust or other enterprise, prior to the final disposition of the proceeding, promptly following request therefor, all expenses incurred by any director or officer in connection with such proceeding, provided, however, that, if the DGCL requires, an advancement of expenses incurred by a director or officer in his or her capacity as a director or officer (and not in any other capacity in which service was or is rendered by such indemnitee, including, without limitation, service to an employee benefit plan) shall be made only upon delivery to the corporation of an undertaking, by or on behalf of such indemnitee, to repay all amounts so advanced if it shall ultimately be determined by final judicial decision from which there is no further right to appeal that such indemnitee is not entitled to be indemnified for such expenses under this Section 43 or otherwise.

Notwithstanding the foregoing, unless otherwise determined pursuant to paragraph (e) of this Bylaw, no advance shall be made by the corporation to an officer of the corporation (except by reason of the fact that such officer is or was a director of the corporation, in which event this paragraph shall not apply) in any action, suit or proceeding, whether civil, criminal, administrative or investigative, if a determination is reasonably and promptly made (i) by a majority vote of a quorum consisting of directors who were not parties to the proceeding, even if not a quorum, or (ii) by a committee of such directors designated by a majority of such directors, even though less than a quorum, or (iii) if there are no such directors, or such directors so direct,

by independent legal counsel in a written opinion, that the facts known to the decision-making party at the time such determination is made demonstrate clearly and convincingly that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation.

(d) Enforcement. Without the necessity of entering into an express contract, all rights to indemnification and advances to directors and officers under this Bylaw shall be deemed to be contractual rights and be effective to the same extent and as if provided for in a contract between the corporation and the director or officer. Any right to indemnification or advances granted by this Bylaw to a director or officer shall be enforceable by or on behalf of the person holding such right in any court of competent jurisdiction if (i) the claim for indemnification or advances is denied, in whole or in part, or (ii) no disposition of such claim is made within ninety (90) days of request therefor. The claimant in such enforcement action, if successful in whole or in part, shall be entitled to be paid also the expense of prosecuting the claim. In connection with any claim for indemnification, the corporation shall be entitled to raise as a defense to any such action that the claimant has not met the standards of conduct that make it permissible under the DGCL or any other applicable law for the corporation to indemnify the claimant for the amount claimed. In connection with any claim by an officer of the corporation (except in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such officer is or was a director of the corporation) for advances, the corporation shall be entitled to raise as a defense as to any such action clear and convincing evidence that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation, or with respect to any criminal action or proceeding that such person acted without reasonable cause to believe that his conduct was lawful. Neither the failure of the corporation (including its Board of Directors, independent legal counsel or its stockholders) to have made a determination prior to the commencement of such action that indemnification of the claimant is proper in the circumstances because he has met the applicable standard of conduct set forth in the DGCL or any other applicable law, nor an actual determination by the corporation (including its Board of Directors, independent legal counsel or its stockholders) that the claimant has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that claimant has not met the applicable standard of conduct. In any suit brought by a director or officer to enforce a right to indemnification or to an advancement of expenses hereunder, the burden of proving that the director or officer is not entitled to be indemnified, or to such advancement of expenses, under this Article XI or otherwise shall be on the corporation.

(e) Non-Exclusivity of Rights. The rights conferred on any person by this Bylaw shall not be exclusive of any other right which such person may have or hereafter acquire under any applicable statute, provision of the Certificate of Incorporation, Bylaws, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in his official capacity and as to action in another capacity while holding office. The corporation is specifically authorized to enter into individual contracts with any or all of its directors, officers, employees or agents respecting indemnification and advances, to the fullest extent not prohibited by the DGCL or any other applicable law.

(f) Survival of Rights. The rights conferred on any person by this Bylaw shall continue as to a person who has ceased to be a director, officer, employee or other agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

(g) Insurance. To the fullest extent permitted by the DGCL, or any other applicable law, the corporation, upon approval by the Board of Directors, may purchase insurance on behalf of any person required or permitted to be indemnified pursuant to this Bylaw.

(h) Amendments. Any repeal or modification of this Bylaw shall only be prospective and shall not affect the rights under this Bylaw in effect at the time of the alleged occurrence of any action or omission to act that is the cause of any proceeding against any agent of the corporation.

(i) Saving Clause. If this Bylaw or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the corporation shall nevertheless indemnify each director and officer to the full extent not prohibited by any applicable portion of this Bylaw that shall not have been invalidated, or by any other applicable law. If this Section 43 shall be invalid due to the application of the indemnification provisions of another jurisdiction, then the corporation shall indemnify each director and officer to the full extent under applicable law.

(j) Certain Definitions. For the purposes of this Bylaw, the following definitions shall apply:

(1) The term “proceeding” shall be broadly construed and shall include, without limitation, the investigation, preparation, prosecution, defense, settlement, arbitration and appeal of, and the giving of testimony in, any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative.

(2) The term “expenses” shall be broadly construed and shall include, without limitation, court costs, attorneys’ fees, witness fees, fines, amounts paid in settlement or judgment and any other costs and expenses of any nature or kind incurred in connection with any proceeding.

(3) The term the “corporation” shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had power and authority to indemnify its directors, officers, and employees or agents, so that any person who is or was a director, officer, employee or agent of such constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in the same position under the provisions of this Bylaw with respect to the resulting or surviving corporation as he would have with respect to such constituent corporation if its separate existence had continued.

(4) References to a “director,” “officer,” “employee,” or “agent” of the corporation shall include, without limitation, situations where such person is serving at the

request of the corporation as, respectively, a director, officer, employee, trustee or agent of another corporation, partnership, joint venture, trust or other enterprise.

(5) References to "other enterprises" shall include employee benefit plans; references to "fines" shall include any excise taxes assessed on a person with respect to an employee benefit plan; and references to "serving at the request of the corporation" shall include any service as a director, officer, employee or agent of the corporation which imposes duties on, or involves services by, such director, officer, employee, or agent with respect to an employee benefit plan, its participants, or beneficiaries; and a person who acted in good faith and in a manner he reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "not opposed to the best interests of the corporation" as referred to in this Bylaw.

ARTICLE XII

NOTICES

Section 44. Notices.

(a) Notice to Stockholders. Written notice to stockholders of stockholder meetings shall be given as provided in Section 7 herein. Without limiting the manner by which notice may otherwise be given effectively to stockholders under any agreement or contract with such stockholder, and except as otherwise required by law, written notice to stockholders for purposes other than stockholder meetings may be sent by United States mail or nationally recognized overnight courier, or by facsimile, telegraph or telex or by electronic mail or other electronic means.

(b) Notice to Directors. Any notice required to be given to any director may be given by the method stated in subsection (a), or as provided for in Section 21 of these Bylaws. If such notice is not delivered personally, it shall be sent to such address as such director shall have filed in writing with the Secretary, or, in the absence of such filing, to the last known post office address of such director.

(c) Affidavit of Mailing. An affidavit of mailing, executed by a duly authorized and competent employee of the corporation or its transfer agent appointed with respect to the class of stock affected or other agent, specifying the name and address or the names and addresses of the stockholder or stockholders, or director or directors, to whom any such notice or notices was or were given, and the time and method of giving the same, shall in the absence of fraud, be prima facie evidence of the facts therein contained.

(d) Methods of Notice. It shall not be necessary that the same method of giving notice be employed in respect of all recipients of notice, but one permissible method may be employed in respect of any one or more, and any other permissible method or methods may be employed in respect of any other or others.

(e) Notice to Person with Whom Communication Is Unlawful. Whenever notice is required to be given, under any provision of law or of the Certificate of Incorporation or Bylaws of the corporation, to any person with whom communication is unlawful, the giving of

such notice to such person shall not be required and there shall be no duty to apply to any governmental authority or agency for a license or permit to give such notice to such person. Any action or meeting which shall be taken or held without notice to any such person with whom communication is unlawful shall have the same force and effect as if such notice had been duly given. In the event that the action taken by the corporation is such as to require the filing of a certificate under any provision of the DGCL, the certificate shall state, if such is the fact and if notice is required, that notice was given to all persons entitled to receive notice except such persons with whom communication is unlawful.

(f) Notice to Stockholders Sharing an Address. Except as otherwise prohibited under DGCL, any notice given under the provisions of DGCL, the Certificate of Incorporation or the Bylaws shall be effective if given by a single written notice to stockholders who share an address if consented to by the stockholders at that address to whom such notice is given. Such consent shall have been deemed to have been given if such stockholder fails to object in writing to the corporation within 60 days of having been given notice by the corporation of its intention to send the single notice. Any consent shall be revocable by the stockholder by written notice to the corporation.

ARTICLE XIII

AMENDMENTS

Section 45. Amendments. The Board of Directors is expressly empowered to adopt, amend or repeal Bylaws of the corporation. The stockholders shall also have power to adopt, amend or repeal the Bylaws of the corporation; *provided, however*, that, in addition to any vote of the holders of any class or series of stock of the corporation required by law or by the Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least a majority of the voting power of all of the then-outstanding shares of the capital stock of the corporation entitled to vote generally in the election of directors, voting together as a single class.

ARTICLE XIV

RIGHT OF FIRST REFUSAL

Section 46. Right of First Refusal. No stockholder shall sell, assign, pledge, or in any manner transfer any of the shares of common stock of the corporation (the "Subject Shares") or any right or interest therein, whether voluntarily or by operation of law, or by gift or otherwise, except by a transfer which meets the requirements hereinafter set forth in this bylaw:

(a) If the stockholder desires to sell or otherwise transfer any of his or her Subject Shares, then the stockholder shall first give written notice thereof to the corporation. The notice shall name the proposed transferee and state the number of Subject Shares to be transferred, the proposed consideration, and all other terms and conditions of the proposed transfer.

(b) For thirty (30) days following receipt of such notice, the corporation shall have the option to purchase all (but not less than all) of the Subject Shares specified in the notice at the price and upon the terms set forth in such notice; *provided, however,* that, with the consent of the stockholder, the corporation shall have the option to purchase a lesser portion of the Subject Shares specified in said notice at the price and upon the terms set forth therein. In the event of a gift, property settlement or other transfer in which the proposed transferee is not paying the full price for the Subject Shares, and that is not otherwise exempted from the provisions of this Section 46, the price shall be deemed to be the fair market value of the common stock of the corporation at such time as determined in good faith by the Board of Directors. In the event the corporation elects to purchase all of the Subject Shares or, with consent of the stockholder, a lesser portion of the Subject Shares, it shall give written notice to the transferring stockholder of its election and settlement for said Subject Shares shall be made as provided below in paragraph (d).

(c) The corporation may assign its rights hereunder.

(d) In the event the corporation and/or its assignee(s) elect to acquire any of the Subject Shares of the transferring stockholder as specified in said transferring stockholder's notice, the Secretary of the corporation shall so notify the transferring stockholder and settlement thereof shall be made in cash within thirty (30) days after the Secretary of the corporation receives said transferring stockholder's notice; provided that if the terms of payment set forth in said transferring stockholder's notice were other than cash against delivery, the corporation and/or its assignee(s) shall pay for said Subject Shares on the same terms and conditions set forth in said transferring stockholder's notice.

(e) In the event the corporation and/or its assignees(s) do not elect to acquire all of the Subject Shares specified in the transferring stockholder's notice, said transferring stockholder may, within the sixty (60) day period following the expiration of the option rights granted to the corporation and/or its assignees(s) herein, transfer the Subject Shares specified in said transferring stockholder's notice which were not acquired by the corporation and/or its assignees(s) as specified in said transferring stockholder's notice. All Subject Shares so sold by said transferring stockholder shall continue to be subject to the provisions of this bylaw in the same manner as before said transfer.

(f) Anything to the contrary contained herein notwithstanding, the following transactions shall be exempt from the provisions of this bylaw:

(1) A stockholder's transfer of any or all Subject Shares held either during such stockholder's lifetime or on death by will or intestacy to such stockholder's immediate family or to any custodian or trustee for the account of such stockholder or such stockholder's immediate family or to any limited partnership of which the stockholder, members of such stockholder's immediate family or any trust for the account of such stockholder or such stockholder's immediate family will be the general of limited partner(s) of such partnership. "Immediate family" as used herein shall mean spouse, lineal descendant, father, mother, brother, or sister of the stockholder making such transfer.

(2) A stockholder's bona fide pledge or mortgage of any Subject Shares with a commercial lending institution, provided that any subsequent transfer of said Subject Shares by said institution shall be conducted in the manner set forth in this bylaw.

(3) A stockholder's transfer of any or all of such stockholder's Subject Shares to the corporation or to any other stockholder of the corporation.

(4) A stockholder's transfer of any or all of such stockholder's Subject Shares to a person who, at the time of such transfer, is an officer or director of the corporation.

(5) A corporate stockholder's transfer of any or all of its Subject Shares pursuant to and in accordance with the terms of any merger, consolidation, reclassification of shares or capital reorganization of the corporate stockholder, or pursuant to a sale of all or substantially all of the stock or assets of a corporate stockholder.

(6) A corporate stockholder's transfer of any or all of its Subject Shares to any or all of its stockholders.

(7) A transfer by a stockholder which is a limited or general partnership to any or all of its partners or former partners.

In any such case, the transferee, assignee, or other recipient shall receive and hold such Subject Shares subject to the provisions of this bylaw, and there shall be no further transfer of such Subject Shares except in accord with this bylaw.

(g) The provisions of this bylaw may be waived with respect to any transfer either by the corporation, upon duly authorized action of its Board of Directors, or by the stockholders, upon the express written consent of the owners of a majority of the voting power of the corporation (excluding the votes represented by those shares to be transferred by the transferring stockholder). This bylaw may be amended or repealed either by a duly authorized action of the Board of Directors or by the stockholders, upon the express written consent of the owners of a majority of the voting power of the corporation.

(h) Any sale or transfer, or purported sale or transfer, of Subject Shares shall be null and void unless the terms, conditions, and provisions of this bylaw are strictly observed and followed.

(i) The foregoing right of first refusal shall terminate upon the date securities of the corporation are first offered to the public pursuant to a registration statement filed with, and declared effective by, the United States Securities and Exchange Commission under the Securities Act of 1933, as amended.

(j) The certificates representing Subject Shares shall bear on their face the following legend so long as the foregoing right of first refusal remains in effect:

"THE SHARES REPRESENTED BY THIS CERTIFICATE ARE
SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN

FAVOR OF THE CORPORATION AND/OR ITS ASSIGNEE(S),
AS PROVIDED IN THE BYLAWS OF THE CORPORATION."

ARTICLE XV

LOANS TO OFFICERS

Section 47. Loans to Officers. Except as otherwise prohibited under applicable law, the corporation may lend money to, or guarantee any obligation of, or otherwise assist any officer or other employee of the corporation or of its subsidiaries, including any officer or employee who is a Director of the corporation or its subsidiaries, whenever, in the judgment of the Board of Directors, such loan, guarantee or assistance may reasonably be expected to benefit the corporation. The loan, guarantee or other assistance may be with or without interest and may be unsecured, or secured in such manner as the Board of Directors shall approve, including, without limitation, a pledge of shares of stock of the corporation. Nothing in these Bylaws shall be deemed to deny, limit or restrict the powers of guaranty or warranty of the corporation at common law or under any statute.

ARTICLE XVI

MISCELLANEOUS

Section 48. Annual Report.

(a) Subject to the provisions of paragraph (b) of this Bylaw, the Board of Directors shall cause an annual report to be sent to each stockholder of the corporation not later than one hundred twenty (120) days after the close of the corporation's fiscal year. Such report shall include a balance sheet as of the end of such fiscal year and an income statement and statement of changes in financial position for such fiscal year, accompanied by any report thereon of independent accountants or, if there is no such report, the certificate of an authorized officer of the corporation that such statements were prepared without audit from the books and records of the corporation. When there are more than one hundred (100) stockholders of record of the corporation's shares, as determined by Section 605 of the CGCL, additional information as required by Section 1501(b) of the CGCL shall also be contained in such report, provided that if the corporation has a class of securities registered under Section 12 of the 1934 Act, the 1934 Act shall take precedence. Such report shall be sent to stockholders at least fifteen (15) days prior to the next annual meeting of stockholders after the end of the fiscal year to which it relates.

(b) If and so long as there are fewer than one hundred (100) holders of record of the corporation's shares, the requirement of sending of an annual report to the stockholders of the corporation is hereby expressly waived.

CERTIFICATE OF SECRETARY

I HEREBY CERTIFY THAT:

I am the duly elected and acting Secretary of Celladon Corporation, a Delaware corporation (the "Company"); and

Attached hereto is a complete and accurate copy of the Bylaws of the Company as duly adopted by the Board of Directors by Unanimous Written Consent dated April 12, 2012 and said Bylaws are presently in effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed the seal of the Company this 12th day of April, 2012.

/s/ Jason L. Kent

JASON L. KENT, ESQ.
Secretary

AMENDED AND RESTATED BYLAWS OF CELLADON CORPORATION

ARTICLE I

OFFICES

Section 1. Registered Office. The registered office of the corporation in the State of Delaware shall be in the City of Wilmington, County of New Castle.

Section 2. Other Offices. The corporation shall also have and maintain an office or principal place of business at such place as may be fixed by the corporation's Board of Directors (the "***Board of Directors***"), and may also have offices at such other places, both within and without the State of Delaware as the Board of Directors may from time to time determine or the business of the corporation may require.

ARTICLE II

CORPORATE SEAL

Section 3. Corporate Seal. The Board of Directors may adopt a corporate seal. The corporate seal shall consist of a die bearing the name of the corporation and the inscription, "Corporate Seal-Delaware." Said seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE III

STOCKHOLDERS' MEETINGS

Section 4. Place of Meetings. Meetings of the stockholders of the corporation may be held at such place, either within or without the State of Delaware, as may be determined from time to time by the Board of Directors. The Board of Directors may, in its sole discretion, determine that the meeting shall not be held at any place, but may instead be held solely by means of remote communication as provided under the Delaware General Corporation Law (the "***DGCL***").

Section 5. Annual Meetings.

(a) The annual meeting of the stockholders of the corporation, for the purpose of election of directors and for such other business as may properly come before it, shall be held on such date and at such time as may be designated from time to time by the Board of Directors. Nominations of persons for election to the Board of Directors of the corporation and the proposal of business to be considered by the stockholders may be made at an annual meeting of stockholders: (i) pursuant to the corporation's notice of meeting of stockholders (with respect to business other than nominations); (ii) brought specifically by or at the direction of the Board of

Directors; or (iii) by any stockholder of the corporation who was a stockholder of record at the time of giving the stockholder's notice provided for in Section 5(b) of these Amended and Restated Bylaws (the "***Bylaws***"), who is entitled to vote at the meeting and who complied with the notice procedures set forth in this Section 5. For the avoidance of doubt, clause (iii) above shall be the exclusive means for a stockholder to make nominations and submit other business (other than matters properly included in the corporation's notice of meeting of stockholders and proxy statement under Rule 14a-8 under the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder (the "***1934 Act***")) before an annual meeting of stockholders.

(b) At an annual meeting of the stockholders, only such business shall be conducted as is a proper matter for stockholder action under Delaware law and as shall have been properly brought before the meeting.

i. For nominations for the election to the Board of Directors to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Bylaws, the stockholder must deliver written notice to the Secretary at the principal executive offices of the corporation on a timely basis as set forth in Section 5(b)(iii) of these Bylaws and must update and supplement such written notice on a timely basis as set forth in Section 5(c) of these Bylaws. Such stockholder's notice shall set forth: (A) as to each nominee such stockholder proposes to nominate at the meeting: (1) the name, age, business address and residence address of such nominee; (2) the principal occupation or employment of such nominee; (3) the class and number of shares of each class of capital stock of the corporation which are owned of record and beneficially by such nominee; (4) the date or dates on which such shares were acquired and the investment intent of such acquisition; (5) with respect to each nominee for election or re-election to the Board of Directors, include a completed and signed questionnaire, representation and agreement required by Section 5(e) of these Bylaws; and (6) such other information concerning such nominee as would be required to be disclosed in a proxy statement soliciting proxies for the election of such nominee as a director in an election contest (even if an election contest is not involved), or that is otherwise required to be disclosed pursuant to Section 14 of the 1934 Act and the rules and regulations promulgated thereunder (including such person's written consent to being named as a nominee and to serving as a director if elected); and (B) the information required by Section 5(b)(iv) of these Bylaws. The corporation may require any proposed nominee to furnish such other information as it may reasonably require to determine the eligibility of such proposed nominee to serve as an independent director of the corporation or that could be material to a reasonable stockholder's understanding of the independence, or lack thereof, of such proposed nominee.

ii. Other than proposals sought to be included in the corporation's proxy materials pursuant to Rule 14(a)-8 under the 1934 Act, for business other than nominations for the election to the Board of Directors to be properly brought before an annual meeting by a stockholder pursuant to clause (iii) of Section 5(a) of these Bylaws, the stockholder must deliver written notice to the Secretary at the principal executive offices of the corporation on a timely basis as set forth in Section 5(b)(iii) of these Bylaws, and must update and supplement such written notice on a timely basis as set forth in Section 5(c) of these Bylaws. Such stockholder's notice shall set forth: (A) as to each matter such stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the reasons for conducting such business at the meeting, and any material interest

(including any anticipated benefit of such business to any Proponent (as defined below) other than solely as a result of its ownership of the corporation's capital stock, that is material to any Proponent individually, or to the Proponents in the aggregate) in such business of any Proponent; and (B) the information required by Section 5(b)(iv) of these Bylaws.

iii. To be timely, the written notice required by Section 5(b)(i) or 5(b)(ii) of these Bylaws must be received by the Secretary at the principal executive offices of the corporation not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the first anniversary of the preceding year's annual meeting; *provided, however,* that, subject to the last sentence of this Section 5(b)(iii), in the event that the date of the annual meeting is advanced more than 30 days prior to or delayed by more than 30 days after the anniversary of the preceding year's annual meeting, notice by the stockholder to be timely must be so received not earlier than the close of business on the 120th day prior to such annual meeting and not later than the close of business on the later of the 90th day prior to such annual meeting or the 10th day following the day on which public announcement of the date of such meeting is first made. In no event shall an adjournment or a postponement of an annual meeting for which notice has been given, or the public announcement thereof has been made, commence a new time period for the giving of a stockholder's notice as described above.

iv. The written notice required by Section 5(b)(i) or 5(b)(ii) of these Bylaws shall also set forth, as of the date of the notice and as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the nomination or proposal is made (each, a "***Proponent***" and collectively, the "***Proponents***"): (A) the name and address of each Proponent, as they appear on the corporation's books; (B) the class, series and number of shares of the corporation that are owned beneficially and of record by each Proponent; (C) a description of any agreement, arrangement or understanding (whether oral or in writing) with respect to such nomination or proposal between or among any Proponent and any of its affiliates or associates, and any others (including their names) acting in concert, or otherwise under the agreement, arrangement or understanding, with any of the foregoing; (D) a representation that the Proponents are holders of record or beneficial owners, as the case may be, of shares of the corporation entitled to vote at the meeting and intend to appear in person or by proxy at the meeting to nominate the person or persons specified in the notice (with respect to a notice under Section 5(b)(i) of these Bylaws) or to propose the business that is specified in the notice (with respect to a notice under Section 5(b)(ii) of these Bylaws); (E) a representation as to whether the Proponents intend to deliver a proxy statement and form of proxy to holders of a sufficient number of holders of the corporation's voting shares to elect such nominee or nominees (with respect to a notice under Section 5(b)(i) of these Bylaws) or to carry such proposal (with respect to a notice under Section 5(b)(ii) of these Bylaws); (F) to the extent known by any Proponent, the name and address of any other stockholder supporting the proposal on the date of such stockholder's notice; and (G) a description of all Derivative Transactions (as defined below) by each Proponent during the previous 12-month period, including the date of the transactions and the class, series and number of securities involved in, and the material economic terms of, such Derivative Transactions.

For purposes of Sections 5 and 6 of these Bylaws, a "***Derivative Transaction***" means any agreement, arrangement, interest or understanding entered into by, or on behalf or for the benefit of, any Proponent or any of its affiliates or associates, whether record or beneficial:

(w) the value of which is derived in whole or in part from the value of any class or series of shares or other securities of the corporation;

(x) which otherwise provides any direct or indirect opportunity to gain or share in any gain derived from a change in the value of securities of the corporation;

(y) the effect or intent of which is to mitigate loss, manage risk or benefit of security value or price changes; or

(z) which provides the right to vote or increase or decrease the voting power of, such Proponent, or any of its affiliates or associates, with respect to any securities of the corporation,

which agreement, arrangement, interest or understanding may include, without limitation, any option, warrant, debt position, note, bond, convertible security, swap, stock appreciation right, short position, profit interest, hedge, right to dividends, voting agreement, performance-related fee or arrangement to borrow or lend shares (whether or not subject to payment, settlement, exercise or conversion in any such class or series), and any proportionate interest of such Proponent in the securities of the corporation held by any general or limited partnership, or any limited liability company, of which such Proponent is, directly or indirectly, a general partner or managing member.

(c) A stockholder providing written notice required by Section 5(b)(i) or (ii) of these Bylaws shall update and supplement such notice in writing, if necessary, so that the information provided or required to be provided in such notice is true and correct in all material respects as of (i) the record date for the meeting and (ii) the date that is five business days prior to the meeting and, in the event of any adjournment or postponement thereof, five business days prior to such adjourned or postponed meeting. In the case of an update and supplement pursuant to clause (i) of this Section 5(c), such update and supplement shall be received by the Secretary at the principal executive offices of the corporation not later than five business days after the record date for the meeting. In the case of an update and supplement pursuant to clause (ii) of this Section 5(c), such update and supplement shall be received by the Secretary at the principal executive offices of the corporation not later than two business days prior to the date for the meeting, and, in the event of any adjournment or postponement thereof, two business days prior to such adjourned or postponed meeting.

(d) Notwithstanding anything in Section 5(b)(iii) of these Bylaws to the contrary, in the event that the number of directors in an Expiring Class (as defined below) is increased and there is no public announcement of the appointment of a director to such class, or, if no appointment was made, of the vacancy in such class, made by the corporation at least 10 days before the last day a stockholder may deliver a notice of nomination in accordance with Section 5(b)(iii) of these Bylaws, a stockholder's notice required by this Section 5 and which complies with the requirements in Section 5(b)(i) of these Bylaws, other than the timing

requirements in Section 5(b)(iii) of these Bylaws, shall also be considered timely, but only with respect to nominees for any new positions in such Expiring Class created by such increase, if it shall be received by the Secretary at the principal executive offices of the corporation not later than the close of business on the 10th day following the day on which such public announcement is first made by the corporation. For purposes of this Section 5, an "***Expiring Class***" shall mean a class of directors whose term shall expire at the next annual meeting of stockholders.

(e) To be eligible to be a nominee for election or re-election as a director of the corporation pursuant to a nomination under clause (iii) of Section 5(a) of these Bylaws, such proposed nominee or a person on such proposed nominee's behalf must deliver (in accordance with the time periods prescribed for delivery of notice under Section 5(b)(iii) or 5(d) of these Bylaws, as applicable) to the Secretary at the principal executive offices of the corporation a written questionnaire with respect to the background and qualification of such proposed nominee and the background of any other person or entity on whose behalf the nomination is being made (which questionnaire shall be provided by the Secretary upon written request) and a written representation and agreement (in the form provided by the Secretary upon written request) that such person: (i) is not and will not become a party to (A) any agreement, arrangement or understanding with, and has not given any commitment or assurance to, any person or entity as to how such person, if elected as a director of the corporation, will act or vote on any issue or question (a "***Voting Commitment***") that has not been disclosed to the corporation in the questionnaire or (B) any Voting Commitment that could limit or interfere with such person's ability to comply, if elected as a director of the corporation, with such person's fiduciary duties under applicable law; (ii) is not and will not become a party to any agreement, arrangement or understanding with any person or entity other than the corporation with respect to any direct or indirect compensation, reimbursement or indemnification in connection with service or action as a director of the corporation that has not been disclosed therein; and (iii) in such person's individual capacity and on behalf of any person or entity on whose behalf the nomination is being made, would be in compliance, if elected as a director of the corporation, and will comply with, all applicable publicly disclosed corporate governance, conflict of interest, confidentiality and stock ownership and trading policies and guidelines of the corporation.

(f) A person shall not be eligible for election or re-election as a director unless the person is nominated either in accordance with clause (ii) of Section 5(a) of these Bylaws, or in accordance with clause (iii) of Section 5(a) of these Bylaws. Except as otherwise required by law, the chairman of the meeting shall have the power and duty to determine whether a nomination or any business proposed to be brought before the meeting was made, or proposed, as the case may be, in accordance with the procedures set forth in these Bylaws and, if any proposed nomination or business is not in compliance with these Bylaws, or the Proponent does not act in accordance with the representations in Sections 5(b)(iv)(D) and 5(b)(iv)(E) of these Bylaws, to declare that such proposal or nomination shall not be presented for stockholder action at the meeting and shall be disregarded, notwithstanding that proxies in respect of such nominations or such business may have been solicited or received.

(g) Notwithstanding the foregoing provisions of this Section 5, in order to include information with respect to a stockholder proposal in the proxy statement and form of proxy for a stockholders' meeting, a stockholder must also comply with all applicable requirements of the 1934 Act and the rules and regulations thereunder. Nothing in these Bylaws

shall be deemed to affect any rights of stockholders to request inclusion of proposals in the corporation's proxy statement pursuant to Rule 14a-8 under the 1934 Act; *provided, however,* that any references in these Bylaws to the 1934 Act or the rules and regulations thereunder are not intended to and shall not limit the requirements applicable to proposals and/or nominations to be considered pursuant to Section 5(a)(iii) of these Bylaws.

(h) For purposes of Sections 5 and 6 of these Bylaws,

i. "***public announcement***" shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the 1934 Act; and

ii. "***affiliates***" and "***associates***" shall have the meanings set forth in Rule 405 under the Securities Act of 1933, as amended.

Section 6. Special Meetings.

(a) Special meetings of the stockholders of the corporation may be called, for any purpose as is a proper matter for stockholder action under Delaware law, by (i) the Chairman of the Board of Directors, (ii) the Chief Executive Officer, or (iii) the Board of Directors pursuant to a resolution adopted by a majority of the total number of authorized directors (whether or not there exist any vacancies in previously authorized directorships at the time any such resolution is presented to the Board of Directors for adoption).

(b) The Board of Directors shall determine the time and place, if any, of such special meeting. Upon determination of the time and place, if any, of the meeting, the Secretary shall cause a notice of meeting to be given to the stockholders entitled to vote, in accordance with the provisions of Section 7 of these Bylaws. No business may be transacted at such special meeting otherwise than specified in the notice of meeting.

(c) Nominations of persons for election to the Board of Directors may be made at a special meeting of stockholders at which directors are to be elected (i) by or at the direction of the Board of Directors or (ii) by any stockholder of the corporation who is a stockholder of record at the time of giving notice provided for in this paragraph, who shall be entitled to vote at the meeting and who delivers written notice to the Secretary of the corporation setting forth the information required by Section 5(b)(i) of these Bylaws. In the event the corporation calls a special meeting of stockholders for the purpose of electing one or more directors to the Board of Directors, any such stockholder of record may nominate a person or persons (as the case may be), for election to such position(s) as specified in the corporation's notice of meeting, if written notice setting forth the information required by Section 5(b)(i) of these Bylaws shall be received by the Secretary at the principal executive offices of the corporation not later than the close of business on the later of the 90th day prior to such meeting or the 10th day following the day on which public announcement is first made of the date of the special meeting and of the nominees proposed by the Board of Directors to be elected at such meeting. The stockholder shall also update and supplement such information as required under Section 5(c) of these Bylaws. In no event shall an adjournment or a postponement of a special

meeting for which notice has been given, or the public announcement thereof has been made, commence a new time period for the giving of a stockholder's notice as described above.

(d) Notwithstanding the foregoing provisions of this Section 6, a stockholder must also comply with all applicable requirements of the 1934 Act and the rules and regulations thereunder with respect to matters set forth in this Section 6. Nothing in these Bylaws shall be deemed to affect any rights of stockholders to request inclusion of proposals in the corporation's proxy statement pursuant to Rule 14a-8 under the 1934 Act; *provided, however,* that any references in these Bylaws to the 1934 Act or the rules and regulations thereunder are not intended to and shall not limit the requirements applicable to nominations for the election to the Board of Directors to be considered pursuant to Section 6(c) of these Bylaws.

Section 7. Notice Of Meetings. Except as otherwise provided by law, notice, given in writing or by electronic transmission, of each meeting of stockholders shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting, such notice to specify the place, if any, date and hour, in the case of special meetings, the purpose or purposes of the meeting, and the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at any such meeting. If mailed, notice is deemed given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the corporation. If sent via electronic transmission, notice is deemed given as of the sending time recorded at the time of transmission. Notice of the time, place, if any, and purpose of any meeting of stockholders may be waived in writing, signed by the person entitled to notice thereof, or by electronic transmission by such person, either before or after such meeting, and will be waived by any stockholder by his attendance thereat in person, by remote communication, if applicable, or by proxy, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Any stockholder so waiving notice of such meeting shall be bound by the proceedings of any such meeting in all respects as if due notice thereof had been given.

Section 8. Quorum. At all meetings of stockholders, except where otherwise provided by statute or by the corporation's Amended and Restated Certificate of Incorporation ("***Certificate of Incorporation***"), or by these Bylaws, the presence, in person, by remote communication, if applicable, or by proxy duly authorized, of the holders of a majority of the outstanding shares of stock entitled to vote shall constitute a quorum for the transaction of business. In the absence of a quorum, any meeting of stockholders may be adjourned, from time to time, either by the chairman of the meeting or by vote of the holders of a majority of the shares represented thereat, but no other business shall be transacted at such meeting. The stockholders present at a duly called or convened meeting, at which a quorum is present, may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum. Except as otherwise provided by statute or by applicable stock exchange rules, or by the Certificate of Incorporation or these Bylaws, in all matters other than the election of directors, the affirmative vote of the majority of shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders. Except as otherwise provided by statute, the Certificate of Incorporation or these Bylaws, directors shall be

elected by a plurality of the votes of the shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the election of directors. Where a separate vote by a class or classes or series is required, except where otherwise provided by the statute or by the Certificate of Incorporation or these Bylaws, a majority of the outstanding shares of such class or classes or series, present in person, by remote communication, if applicable, or represented by proxy duly authorized, shall constitute a quorum entitled to take action with respect to that vote on that matter. Except where otherwise provided by statute or by the Certificate of Incorporation or these Bylaws, the affirmative vote of the majority (plurality, in the case of the election of directors) of shares of such class or classes or series present in person, by remote communication, if applicable, or represented by proxy at the meeting shall be the act of such class or classes or series.

Section 9. Adjournment and Notice of Adjourned Meetings. Any meeting of stockholders, whether annual or special, may be adjourned from time to time either by the chairman of the meeting or by the vote of a majority of the shares present in person, by remote communication, if applicable, or represented by proxy at the meeting. When a meeting is adjourned to another time or place, if any, notice need not be given of the adjourned meeting if the time and place, if any, thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than 30 days or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

Section 10. Voting Rights. For the purpose of determining those stockholders entitled to vote at any meeting of the stockholders, except as otherwise provided by law, only persons in whose names shares stand on the stock records of the corporation on the record date, as provided in Section 12 of these Bylaws, shall be entitled to vote at any meeting of stockholders. Every person entitled to vote shall have the right to do so either in person, by remote communication, if applicable, or by an agent or agents authorized by a proxy granted in accordance with Delaware law. An agent so appointed need not be a stockholder. No proxy shall be voted after three years from its date of creation unless the proxy provides for a longer period.

Section 11. Joint Owners of Stock. If shares or other securities having voting power stand of record in the names of two or more persons, whether fiduciaries, members of a partnership, joint tenants, tenants in common, tenants by the entirety, or otherwise, or if two or more persons have the same fiduciary relationship respecting the same shares, unless the Secretary is given written notice to the contrary and is furnished with a copy of the instrument or order appointing them or creating the relationship wherein it is so provided, their acts with respect to voting shall have the following effect: (a) if only one votes, his act binds all; (b) if more than one votes, the act of the majority so voting binds all; or (c) if more than one votes, but the vote is evenly split on any particular matter, each faction may vote the securities in question proportionally, or may apply to the Delaware Court of Chancery for relief as provided in the DGCL, Section 217(b). If the instrument filed with the Secretary shows that any such tenancy is held in unequal interests, a majority or even-split for the purpose of clause (c) of this Section 11 shall be a majority or even-split in interest.

Section 12. List of Stockholders. The Secretary shall prepare and make, at least 10 days before every meeting of stockholders, a complete list of the stockholders entitled to vote at said meeting, arranged in alphabetical order, showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, (a) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or (b) during ordinary business hours, at the principal place of business of the corporation. In the event that the corporation determines to make the list available on an electronic network, the corporation may take reasonable steps to ensure that such information is available only to stockholders of the corporation. The list shall be open to examination of any stockholder during the time of the meeting as provided by law.

Section 13. Action Without Meeting. No action shall be taken by the stockholders except at an annual or special meeting of stockholders called in accordance with these Bylaws, and no action shall be taken by the stockholders by written consent or electronic transmission.

Section 14. Organization.

(a) At every meeting of stockholders, the Chairman of the Board of Directors, or, if a Chairman has not been appointed or is absent, the President, or, if the President is absent, a chairman of the meeting chosen by a majority in interest of the stockholders entitled to vote, present in person or by proxy, shall act as chairman. The Secretary, or, in his or her absence, an Assistant Secretary directed to do so by the President, shall act as secretary of the meeting.

(b) The Board of Directors of the corporation shall be entitled to make such rules or regulations for the conduct of meetings of stockholders as it shall deem necessary, appropriate or convenient. Subject to such rules and regulations of the Board of Directors, if any, the chairman of the meeting shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are necessary, appropriate or convenient for the proper conduct of the meeting, including, without limitation, establishing an agenda or order of business for the meeting, rules and procedures for maintaining order at the meeting and the safety of those present, limitations on participation in such meeting to stockholders of record of the corporation and their duly authorized and constituted proxies and such other persons as the chairman shall permit, restrictions on entry to the meeting after the time fixed for the commencement thereof, limitations on the time allotted to questions or comments by participants and regulation of the opening and closing of the polls for balloting on matters which are to be voted on by ballot. The date and time of the opening and closing of the polls for each matter upon which the stockholders will vote at the meeting shall be announced at the meeting. Unless and to the extent determined by the Board of Directors or the chairman of the meeting, meetings of stockholders shall not be required to be held in accordance with rules of parliamentary procedure.

ARTICLE IV

DIRECTORS

Section 15. Number and Term of Office. The authorized number of directors of the corporation shall be fixed in accordance with the Certificate of Incorporation. Directors need not be stockholders unless so required by the Certificate of Incorporation. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient at a special meeting of the stockholders called for that purpose in the manner provided in these Bylaws.

Section 16. Powers. The powers of the corporation shall be exercised, its business conducted and its property controlled by the Board of Directors, except as may be otherwise provided by statute or by the Certificate of Incorporation.

Section 17. Classes of Directors

Subject to the rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, the directors shall be divided into three classes designated as Class I, Class II and Class III, respectively. Initially, directors shall be assigned to each class in accordance with a resolution or resolutions adopted by the Board of Directors. At the first annual meeting of stockholders following the initial classification of the Board of Directors, the term of office of the Class I directors shall expire and Class I directors shall be elected for a full term of three years. At the second annual meeting of stockholders following such initial classification, the term of office of the Class II directors shall expire and Class II directors shall be elected for a full term of three years. At the third annual meeting of stockholders following such initial classification, the term of office of the Class III directors shall expire and Class III directors shall be elected for a full term of three years. At each succeeding annual meeting of stockholders, directors shall be elected for a full term of three years to succeed the directors of the class whose terms expire at such annual meeting.

Notwithstanding the foregoing provisions of this Section 17, each director shall serve until his successor is duly elected and qualified or until his earlier death, resignation or removal. No decrease in the number of directors constituting the Board of Directors shall shorten the term of any incumbent director.

Section 18. Vacancies.

(a) Unless otherwise provided in the Certificate of Incorporation, and subject to the rights of the holders of any series of Preferred Stock, any vacancies on the Board of Directors resulting from death, resignation, disqualification, removal or other causes and any newly created directorships resulting from any increase in the number of directors shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled only by the affirmative vote of a majority of the directors then in office, even though less than a quorum of the Board of Directors, or by a sole remaining director, and not by the stockholders, *provided*, *however*, that whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series shall, unless the Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, be filled by a majority of the directors elected by such class or classes or series thereof then in office, or

by a sole remaining director so elected, and not by the stockholders. Any director elected in accordance with the preceding sentence shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been elected and qualified. A vacancy in the Board of Directors shall be deemed to exist under this Bylaw in the case of the death, removal or resignation of any director.

Section 19. Resignation. Any director may resign at any time by delivering his or her notice in writing or by electronic transmission to the Secretary, such resignation to specify whether it will be effective at a particular time. If no such specification is made, it shall be deemed effective at the time of delivery to the Secretary. When one or more directors shall resign from the Board of Directors, effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective, and each director so chosen shall hold office for the unexpired portion of the term of the director whose place shall be vacated and until his successor shall have been duly elected and qualified.

Section 20. Removal.

(a) Subject to the rights of any series of Preferred Stock to elect additional directors under specified circumstances, neither the Board of Directors nor any individual director may be removed without cause.

(b) Subject to any limitation imposed by law, any individual director or directors may be removed with cause by the affirmative vote of the holders of at least 66 2/3% of the voting power of all then outstanding shares of capital stock of the corporation entitled to vote generally at an election of directors.

Section 21. Duties of Chairman of the Board of Directors. The Chairman of the Board of Directors, when present, shall preside at all meetings of the stockholders and the Board of Directors. The Chairman of the Board of Directors shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

Section 22. Meetings.

(a) Regular Meetings. Unless otherwise restricted by the Certificate of Incorporation, regular meetings of the Board of Directors may be held at any time or date and at any place within or without the State of Delaware which has been designated by the Board of Directors and publicized among all directors, either orally or in writing, by telephone, including a voice-messaging system or other system designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means. No further notice shall be required for regular meetings of the Board of Directors.

(b) Special Meetings. Unless otherwise restricted by the Certificate of Incorporation, special meetings of the Board of Directors may be held at any time and place within or without the State of Delaware whenever called by the Chairman of the Board, the Chief Executive Officer or a majority of the authorized number of directors.

(c) Meetings by Electronic Communications Equipment. Any member of the Board of Directors, or of any committee thereof, may participate in a meeting by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting by such means shall constitute presence in person at such meeting.

(d) Notice of Special Meetings. Notice of the time and place of all special meetings of the Board of Directors shall be orally or in writing, by telephone, including a voice messaging system or other system or technology designed to record and communicate messages, facsimile, telegraph or telex, or by electronic mail or other electronic means, during normal business hours, at least 24 hours before the date and time of the meeting. If notice is sent by U.S. mail, it shall be sent by first class mail, charges prepaid, at least three days before the date of the meeting. Notice of any meeting may be waived in writing, or by electronic transmission, at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

(e) Waiver of Notice. The transaction of all business at any meeting of the Board of Directors, or any committee thereof, however called or noticed, or wherever held, shall be as valid as though it had been transacted at a meeting duly held after regular call and notice, if a quorum be present and if, either before or after the meeting, each of the directors not present who did not receive notice shall sign a written waiver of notice or shall waive notice by electronic transmission. All such waivers shall be filed with the corporate records or made a part of the minutes of the meeting.

Section 23. Quorum And Voting.

(a) Unless the Certificate of Incorporation requires a greater number, and except with respect to questions related to indemnification arising under Section 45 of these Bylaws for which a quorum shall be one-third of the exact number of directors fixed from time to time, a quorum of the Board of Directors shall consist of a majority of the exact number of directors fixed from time to time by the Board of Directors in accordance with the Certificate of Incorporation; *provided, however,* at any meeting whether a quorum be present or otherwise, a majority of the directors present may adjourn from time to time until the time fixed for the next regular meeting of the Board of Directors, without notice other than by announcement at the meeting.

(b) At each meeting of the Board of Directors at which a quorum is present, all questions and business shall be determined by the affirmative vote of a majority of the directors present, unless a different vote be required by law, the Certificate of Incorporation or these Bylaws.

Section 24. Action Without Meeting. Unless otherwise restricted by the Certificate of Incorporation or these Bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent thereto in

writing or by electronic transmission, and such writing or writings or transmission or transmissions are filed with the minutes of proceedings of the Board of Directors or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 25. Fees and Compensation. Directors shall be entitled to such compensation for their services as may be approved by the Board of Directors, including, if so approved, by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, for attendance at each regular or special meeting of the Board of Directors and at any meeting of a committee of the Board of Directors. Nothing herein contained shall be construed to preclude any director from serving the corporation in any other capacity as an officer, agent, employee, or otherwise and receiving compensation therefor.

Section 26. Committees.

(a) Executive Committee. The Board of Directors may appoint an Executive Committee to consist of one or more members of the Board of Directors. The Executive Committee, to the extent permitted by law and provided in the resolution of the Board of Directors shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation, and may authorize the seal of the corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to (i) approving or adopting, or recommending to the stockholders, any action or matter (other than the election or removal of directors) expressly required by the DGCL to be submitted to stockholders for approval, or (ii) adopting, amending or repealing any Bylaw of the corporation.

(b) Other Committees. The Board of Directors may, from time to time, appoint such other committees as may be permitted by law. Such other committees appointed by the Board of Directors shall consist of one or more members of the Board of Directors and shall have such powers and perform such duties as may be prescribed by the resolution or resolutions creating such committees, but in no event shall any such committee have the powers denied to the Executive Committee in these Bylaws.

(c) Term. The Board of Directors, subject to any requirements of any outstanding series of Preferred Stock and the provisions of subsections (a) or (b) of this Section 26, may at any time increase or decrease the number of members of a committee or terminate the existence of a committee. The membership of a committee member shall terminate on the date of his death or voluntary resignation from the committee or from the Board of Directors. The Board of Directors may at any time for any reason remove any individual committee member and the Board of Directors may fill any committee vacancy created by death, resignation, removal or increase in the number of members of the committee. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee, and, in addition, in the absence or disqualification of any member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not he or they constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member.

(d) Meetings. Unless the Board of Directors shall otherwise provide, regular meetings of the Executive Committee or any other committee appointed pursuant to this Section 26 shall be held at such times and places as are determined by the Board of Directors, or by any such committee, and when notice thereof has been given to each member of such committee, no further notice of such regular meetings need be given thereafter. Special meetings of any such committee may be held at any place which has been determined from time to time by such committee, and may be called by any director who is a member of such committee, upon notice to the members of such committee of the time and place of such special meeting given in the manner provided for the giving of notice to members of the Board of Directors of the time and place of special meetings of the Board of Directors. Notice of any special meeting of any committee may be waived in writing or by electronic transmission at any time before or after the meeting and will be waived by any director by attendance thereat, except when the director attends such special meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Unless otherwise provided by the Board of Directors in the resolutions authorizing the creation of the committee, a majority of the authorized number of members of any such committee shall constitute a quorum for the transaction of business, and the act of a majority of those present at any meeting at which a quorum is present shall be the act of such committee.

Section 27. Lead Independent Director. The Chairman of the Board of Directors, or if the Chairman is not an independent director, one of the independent directors, may be designated by the Board of Directors as lead independent director ("***Lead Independent Director***") to serve until replaced by the Board of Directors. The Lead Independent Director will: with the Chairman of the Board of Directors, establish the agenda for regular Board meetings and serve as chairman of Board of Directors meetings in the absence of the Chairman of the Board of Directors; establish the agenda for meetings of the independent directors; coordinate with the committee chairs regarding meeting agendas and informational requirements; preside over meetings of the independent directors; preside over any portions of meetings of the Board of Directors at which the evaluation or compensation of the Chief Executive Officer is presented or discussed; preside over any portions of meetings of the Board of Directors at which the performance of the Board of Directors is presented or discussed; and perform such other duties as may be established or delegated by the Chairman of the Board of Directors**.**

Section 28. Organization. At every meeting of the directors, the Chairman of the Board of Directors, or, if a Chairman has not been appointed or is absent, the Lead Independent Director, or if the Lead Independent Director is absent, the Chief Executive Officer (if a director), or, if a Chief Executive Officer is absent, the President (if a director), or if the President is absent, the most senior Vice President (if a director), or, in the absence of any such person, a chairman of the meeting chosen by a majority of the directors present, shall preside over the meeting. The Secretary, or in his absence, any Assistant Secretary or other officer or director directed to do so by the Chairman, shall act as secretary of the meeting.

ARTICLE V

OFFICERS

Section 29. Officers Designated. The officers of the corporation shall include, if and when designated by the Board of Directors, the Chairman of the Board of Directors, the Chief Executive Officer, the President, one or more Vice Presidents, the Secretary, the Chief Financial Officer and the Treasurer. The Board of Directors may also appoint one or more Assistant Secretaries and Assistant Treasurers and such other officers and agents with such powers and duties as it shall deem necessary. The Board of Directors may assign such additional titles to one or more of the officers as it shall deem appropriate. Any one person may hold any number of offices of the corporation at any one time unless specifically prohibited therefrom by law. The salaries and other compensation of the officers of the corporation shall be fixed by or in the manner designated by the Board of Directors.

Section 30. Tenure and Duties of Officers.

(a) General. All officers shall hold office at the pleasure of the Board of Directors and until their successors shall have been duly elected and qualified, unless sooner removed. Any officer elected or appointed by the Board of Directors may be removed at any time by the Board of Directors. If the office of any officer becomes vacant for any reason, the vacancy may be filled by the Board of Directors.

(b) Duties of Chief Executive Officer. The Chief Executive Officer shall preside at all meetings of the stockholders and at all meetings of the Board of Directors, unless the Chairman of the Board of Directors or the Lead Independent Director has been appointed and is present. Unless an officer has been appointed Chief Executive Officer of the corporation, the President shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. To the extent that a Chief Executive Officer has been appointed and no President has been appointed, all references in these Bylaws to the President shall be deemed references to the Chief Executive Officer. The Chief Executive Officer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

(c) Duties of President. The President shall preside at all meetings of the stockholders and at all meetings of the Board of Directors, unless the Chairman of the Board of Directors, the Lead Independent Director, or the Chief Executive Officer has been appointed and is present. Unless another officer has been appointed Chief Executive Officer of the corporation, the President shall be the chief executive officer of the corporation and shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. The President shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time.

(d) Duties of Vice Presidents. The Vice Presidents may assume and perform the duties of the President in the absence or disability of the President or whenever the office of

President is vacant. The Vice Presidents shall perform other duties commonly incident to their office and shall also perform such other duties and have such other powers as the Board of Directors or the Chief Executive Officer, or, if the Chief Executive Officer has not been appointed or is absent, the President shall designate from time to time.

(e) Duties of Secretary. The Secretary shall attend all meetings of the stockholders and of the Board of Directors and shall record all acts and proceedings thereof in the minute book of the corporation. The Secretary shall give notice in conformity with these Bylaws of all meetings of the stockholders and of all meetings of the Board of Directors and any committee thereof requiring notice. The Secretary shall perform all other duties provided for in these Bylaws and other duties commonly incident to the office and shall also perform such other duties and have such other powers, as the Board of Directors shall designate from time to time. The President may direct any Assistant Secretary or other officer to assume and perform the duties of the Secretary in the absence or disability of the Secretary, and each Assistant Secretary shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

(f) Duties of Chief Financial Officer. The Chief Financial Officer shall keep or cause to be kept the books of account of the corporation in a thorough and proper manner and shall render statements of the financial affairs of the corporation in such form and as often as required by the Board of Directors or the President. The Chief Financial Officer, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the corporation. The Chief Financial Officer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time. To the extent that a Chief Financial Officer has been appointed and no Treasurer has been appointed, all references in these Bylaws to the Treasurer shall be deemed references to the Chief Financial Officer. The President may direct the Treasurer, if any, or any Assistant Treasurer, or the Controller or any Assistant Controller to assume and perform the duties of the Chief Financial Officer in the absence or disability of the Chief Financial Officer, and each Treasurer and Assistant Treasurer and each Controller and Assistant Controller shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

(g) Duties of Treasurer. Unless another officer has been appointed Chief Financial Officer of the corporation, the Treasurer shall be the chief financial officer of the corporation and shall keep or cause to be kept the books of account of the corporation in a thorough and proper manner and shall render statements of the financial affairs of the corporation in such form and as often as required by the Board of Directors or the President, and, subject to the order of the Board of Directors, shall have the custody of all funds and securities of the corporation. The Treasurer shall perform other duties commonly incident to the office and shall also perform such other duties and have such other powers as the Board of Directors or the President shall designate from time to time.

Section 31. Delegation of Authority. The Board of Directors may from time to time delegate the powers or duties of any officer to any other officer or agent, notwithstanding any provision hereof.

Section 32. Resignations. Any officer may resign at any time by giving notice in writing or by electronic transmission to the Board of Directors or to the President or to the Secretary. Any such resignation shall be effective when received by the person or persons to whom such notice is given, unless a later time is specified therein, in which event the resignation shall become effective at such later time. Unless otherwise specified in such notice, the acceptance of any such resignation shall not be necessary to make it effective. Any resignation shall be without prejudice to the rights, if any, of the corporation under any contract with the resigning officer.

Section 33. Removal. Any officer may be removed from office at any time, either with or without cause, by the affirmative vote of a majority of the directors in office at the time, or by the unanimous written consent of the directors in office at the time, or by any committee or by the Chief Executive Officer or by other superior officers upon whom such power of removal may have been conferred by the Board of Directors.

ARTICLE VI

EXECUTION OF CORPORATE INSTRUMENTS AND VOTING OF SECURITIES OWNED BY THE CORPORATION

Section 34. Execution of Corporate Instruments. The Board of Directors may, in its discretion, determine the method and designate the signatory officer or officers, or other person or persons, to execute on behalf of the corporation any corporate instrument or document, or to sign on behalf of the corporation the corporate name without limitation, or to enter into contracts on behalf of the corporation, except where otherwise provided by law or these Bylaws, and such execution or signature shall be binding upon the corporation.

All checks and drafts drawn on banks or other depositaries on funds to the credit of the corporation or in special accounts of the corporation shall be signed by such person or persons as the Board of Directors shall authorize so to do.

Unless authorized or ratified by the Board of Directors or within the agency power of an officer, no officer, agent or employee shall have any power or authority to bind the corporation by any contract or engagement or to pledge its credit or to render it liable for any purpose or for any amount.

Section 35. Voting of Securities Owned by the Corporation. All stock and other securities of other corporations owned or held by the corporation for itself, or for other parties in any capacity, shall be voted, and all proxies with respect thereto shall be executed, by the person authorized so to do by resolution of the Board of Directors, or, in the absence of such authorization, by the Chairman of the Board of Directors, the Chief Executive Officer, the President, or any Vice President.

ARTICLE VII

SHARES OF STOCK

Section 36. Form and Execution of Certificates. The shares of the corporation shall be represented by certificates, or shall be uncertificated if so provided by resolution or resolutions of the Board of Directors. Certificates for the shares of stock of the corporation, if any, shall be in such form as is consistent with the Certificate of Incorporation and applicable law. Every holder of stock represented by certificate in the corporation shall be entitled to have a certificate signed by or in the name of the corporation by the Chairman of the Board of Directors, the Chief Executive Officer, or the President or any Vice President and by the Chief Financial Officer, Treasurer or Assistant Treasurer or the Secretary or Assistant Secretary, certifying the number of shares owned by him in the corporation. Any or all of the signatures on the certificate may be facsimiles. In case any officer, transfer agent, or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent, or registrar before such certificate is issued, it may be issued with the same effect as if he were such officer, transfer agent, or registrar at the date of issue.

Section 37. Lost Certificates. A new certificate or certificates shall be issued in place of any certificate or certificates theretofore issued by the corporation alleged to have been lost, stolen, or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost, stolen, or destroyed. The corporation may require, as a condition precedent to the issuance of a new certificate or certificates, the owner of such lost, stolen, or destroyed certificate or certificates, or the owner's legal representative, to agree to indemnify the corporation in such manner as it shall require or to give the corporation a surety bond in such form and amount as it may direct as indemnity against any claim that may be made against the corporation with respect to the certificate alleged to have been lost, stolen, or destroyed.

Section 38. Transfers.

(a) Transfers of record of shares of stock of the corporation shall be made only upon its books by the holders thereof, in person or by attorney duly authorized, and, in the case of stock represented by certificate, upon the surrender of a properly endorsed certificate or certificates for a like number of shares.

(b) The corporation shall have power to enter into and perform any agreement with any number of stockholders of any one or more classes of stock of the corporation to restrict the transfer of shares of stock of the corporation of any one or more classes owned by such stockholders in any manner not prohibited by the DGCL.

Section 39. Fixing Record Dates.

(a) In order that the corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which record date

shall, subject to applicable law, not be more than 60 nor less than 10 days before the date of such meeting. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided, however*, that the Board of Directors may fix a new record date for the adjourned meeting.

(b) In order that the corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than 60 days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

Section 40. Registered Stockholders. The corporation shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends, and to vote as such owner, and shall not be bound to recognize any equitable or other claim to or interest in such share or shares on the part of any other person whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

ARTICLE VIII

OTHER SECURITIES OF THE CORPORATION

Section 41. Execution of Other Securities. All bonds, debentures and other corporate securities of the corporation, other than stock certificates (covered in Section 36 of these Bylaws), may be signed by the Chairman of the Board of Directors, the Chief Executive Officer, President or any Vice President, or such other person as may be authorized by the Board of Directors, and the corporate seal impressed thereon or a facsimile of such seal imprinted thereon and attested by the signature of the Secretary or an Assistant Secretary, or the Chief Financial Officer or Treasurer or an Assistant Treasurer; *provided, however,* that where any such bond, debenture or other corporate security shall be authenticated by the manual signature, or where permissible facsimile signature, of a trustee under an indenture pursuant to which such bond, debenture or other corporate security shall be issued, the signatures of the persons signing and attesting the corporate seal on such bond, debenture or other corporate security may be the imprinted facsimile of the signatures of such persons. Interest coupons appertaining to any such bond, debenture or other corporate security, authenticated by a trustee as aforesaid, shall be signed by the Treasurer or an Assistant Treasurer of the corporation or such other person as may be authorized by the Board of Directors, or bear imprinted thereon the facsimile signature of such person. In case any officer who shall have signed or attested any bond, debenture or other corporate security, or whose facsimile signature shall appear thereon or on any such interest coupon, shall have ceased to be such officer before the bond, debenture or other corporate

security so signed or attested shall have been delivered, such bond, debenture or other corporate security nevertheless may be adopted by the corporation and issued and delivered as though the person who signed the same or whose facsimile signature shall have been used thereon had not ceased to be such officer of the corporation.

ARTICLE IX

DIVIDENDS

Section 42. Declaration of Dividends. Dividends upon the capital stock of the corporation, subject to the provisions of the Certificate of Incorporation and applicable law, if any, may be declared by the Board of Directors pursuant to law at any regular or special meeting. Dividends may be paid in cash, in property, or in shares of the capital stock, subject to the provisions of the Certificate of Incorporation and applicable law.

Section 43. Dividend Reserve. Before payment of any dividend, there may be set aside out of any funds of the corporation available for dividends such sum or sums as the Board of Directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing dividends, or for repairing or maintaining any property of the corporation, or for such other purpose as the Board of Directors shall think conducive to the interests of the corporation, and the Board of Directors may modify or abolish any such reserve in the manner in which it was created.

ARTICLE X

FISCAL YEAR

Section 44. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the Board of Directors.

ARTICLE XI

INDEMNIFICATION

Section 45. Indemnification of Directors, Officers, Employees and Other Agents.

(a) Directors and Officers. The corporation shall indemnify its directors and officers to the extent not prohibited by the DGCL or any other applicable law; *provided*, *however*, that the corporation may modify the extent of such indemnification by individual contracts with its directors and officers; and, *provided*, *further*, that the corporation shall not be required to indemnify any director or officer in connection with any proceeding (or part thereof) initiated by such person unless (i) such indemnification is expressly required to be made by law, (ii) the proceeding was authorized by the Board of Directors of the corporation, (iii) such indemnification is provided by the corporation, in its sole discretion, pursuant to the powers vested in the corporation under the DGCL or any other applicable law or (iv) such indemnification is required to be made under subsection (d).

(b) Employees and Other Agents. The corporation shall have power to indemnify its employees and other agents as set forth in the DGCL or any other applicable law. The Board of Directors shall have the power to delegate the determination of whether to indemnify any such employee or other agent to such officers or other persons as the Board of Directors so determines.

(c) Expenses. The corporation shall advance to any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a director or officer, of the corporation, or is or was serving at the request of the corporation as a director or officer of another corporation, partnership, joint venture, trust or other enterprise, prior to the final disposition of the proceeding, promptly following request therefor, all expenses incurred by any director or officer in connection with such proceeding provided, however, that if the DGCL requires, an advancement of expenses incurred by a director or officer in his or her capacity as a director or officer (and not in any other capacity in which service was or is rendered by such indemnitee, including, without limitation, service to an employee benefit plan) shall be made only upon delivery to the corporation of an undertaking, by or on behalf of such indemnitee, to repay all amounts so advanced if it shall ultimately be determined by final judicial decision from which there is no further right to appeal that such indemnitee is not entitled to be indemnified for such expenses under this Section 45 or otherwise.

Notwithstanding the foregoing, unless otherwise determined pursuant to paragraph (e) of this Section 45, no advance shall be made by the corporation to an officer of the corporation (except by reason of the fact that such officer is or was a director of the corporation in which event this paragraph shall not apply) in any action, suit or proceeding, whether civil, criminal, administrative or investigative, if a determination is reasonably and promptly made (i) by a majority vote of directors who were not parties to the proceeding, even if not a quorum, or (ii) by a committee of such directors designated by a majority vote of such directors, even though less than a quorum, or (iii) if there are no such directors, or such directors so direct, by independent legal counsel in a written opinion, that the facts known to the decision-making party at the time such determination is made demonstrate clearly and convincingly that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation.

(d) Enforcement. Without the necessity of entering into an express contract, all rights to indemnification and advances to directors and officers under this Section 45 shall be deemed to be contractual rights and be effective to the same extent and as if provided for in a contract between the corporation and the director or officer. Any right to indemnification or advances granted by this Section 45 to a director or officer shall be enforceable by or on behalf of the person holding such right in any court of competent jurisdiction if (i) the claim for indemnification or advances is denied, in whole or in part, or (ii) no disposition of such claim is made within 90 days of request therefor. To the extent permitted by law, the claimant in such enforcement action, if successful in whole or in part, shall be entitled to be paid also the expense of prosecuting the claim. In connection with any claim for indemnification, the corporation shall be entitled to raise as a defense to any such action that the claimant has not met the standards of conduct that make it permissible under the DGCL or any other applicable law for the corporation to indemnify the claimant for the amount claimed. In connection with any claim by an officer of

the corporation (except in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such officer is or was a director of the corporation) for advances, the corporation shall be entitled to raise a defense as to any such action clear and convincing evidence that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation, or with respect to any criminal action or proceeding that such person acted without reasonable cause to believe that his conduct was lawful. Neither the failure of the corporation (including its Board of Directors, independent legal counsel or its stockholders) to have made a determination prior to the commencement of such action that indemnification of the claimant is proper in the circumstances because the officer or director has met the applicable standard of conduct set forth in the DGCL or any other applicable law, nor an actual determination by the corporation (including its Board of Directors, independent legal counsel or its stockholders) that the claimant has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that claimant has not met the applicable standard of conduct. In any suit brought by a director or officer to enforce a right to indemnification or to an advancement of expenses hereunder, the burden of proving that the director or officer is not entitled to be indemnified, or to such advancement of expenses, under this Section 45 or otherwise shall be on the corporation.

(e) Non-Exclusivity of Rights. The rights conferred on any person by this Bylaw shall not be exclusive of any other right which such person may have or hereafter acquire under any applicable statute, provision of the Certificate of Incorporation, Bylaws, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in such person's official capacity and as to action in another capacity while holding office. The corporation is specifically authorized to enter into individual contracts with any or all of its directors, officers, employees or agents respecting indemnification and advances, to the fullest extent not prohibited by the DGCL, or by any other applicable law.

(f) Survival of Rights. The rights conferred on any person by this Bylaw shall continue as to a person who has ceased to be a director or officer, or, if applicable, employee or other agent, and shall inure to the benefit of the heirs, executors and administrators of such a person.

(g) Insurance. To the fullest extent permitted by the DGCL or any other applicable law, the corporation, upon approval by the Board of Directors, may purchase insurance on behalf of any person required or permitted to be indemnified pursuant to this Section 45.

(h) Amendments. Any repeal or modification of this Section 45 shall only be prospective and shall not affect the rights under this Bylaw in effect at the time of the alleged occurrence of any action or omission to act that is the cause of any proceeding against any agent of the corporation.

(i) Saving Clause. If this Bylaw or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the corporation shall nevertheless indemnify each director and officer to the full extent not prohibited by any applicable portion of this Section 45 that shall not have been invalidated, or by any other applicable law. If this Section 45 shall be invalid due to the application of the indemnification provisions of another

jurisdiction, then the corporation shall indemnify each director and officer to the full extent under any other applicable law.

(j) Certain Definitions. For the purposes of this Bylaw, the following definitions shall apply:

i. The term "***proceeding***" shall be broadly construed and shall include, without limitation, the investigation, preparation, prosecution, defense, settlement, arbitration and appeal of, and the giving of testimony in, any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative.

ii. The term "***expenses***" shall be broadly construed and shall include, without limitation, court costs, attorneys' fees, witness fees, fines, amounts paid in settlement or judgment and any other costs and expenses of any nature or kind incurred in connection with any proceeding.

iii. The term the "***corporation***" shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had power and authority to indemnify its directors, officers, and employees or agents, so that any person who is or was a director, officer, employee or agent of such constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in the same position under the provisions of this Section 45 with respect to the resulting or surviving corporation as he would have with respect to such constituent corporation if its separate existence had continued.

iv. References to a "***director***," "***officer***," "***employee***," or "***agent***" of the corporation shall include, without limitation, situations where such person is serving at the request of the corporation as, respectively, a director, officer, employee, trustee or agent of another corporation, partnership, joint venture, trust or other enterprise.

v. References to "***other enterprise***" shall include employee benefit plans; references to "***fines***" shall include any excise taxes assessed on a person with respect to an employee benefit plan; and references to "***serving at the request of the corporation***" shall include any service as a director, officer, employee or agent of the corporation which imposes duties on, or involves services by, such director, officer, employee, or agent with respect to an employee benefit plan, its participants, or beneficiaries; and a person who acted in good faith and in a manner such person reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "***not opposed to the best interests of the corporation***" as referred to in this Section 45.

ARTICLE XII

NOTICES

Section 46. Notices.

(a) Notice to Stockholders. Written notice to stockholders of stockholder meetings shall be given as provided in Section 7 of these Bylaws. Without limiting the manner by which notice may otherwise be given effectively to stockholders under any agreement or contract with such stockholder, and except as otherwise required by law, written notice to stockholders for purposes other than stockholder meetings may be sent by U.S. mail or nationally recognized overnight courier, or by facsimile, telegraph or telex or by electronic mail or other electronic means.

(b) Notice to Directors. Any notice required to be given to any director may be given by the method stated in subsection (a), as otherwise provided in these Bylaws, or by overnight delivery service, facsimile, telex or telegram, except that such notice other than one which is delivered personally shall be sent to such address as such director shall have filed in writing with the Secretary, or, in the absence of such filing, to the last known post office address of such director.

(c) Affidavit of Mailing. An affidavit of mailing, executed by a duly authorized and competent employee of the corporation or its transfer agent appointed with respect to the class of stock affected, or other agent, specifying the name and address or the names and addresses of the stockholder or stockholders, or director or directors, to whom any such notice or notices was or were given, and the time and method of giving the same, shall in the absence of fraud, be prima facie evidence of the facts therein contained.

(d) Methods of Notice. It shall not be necessary that the same method of giving notice be employed in respect of all recipients of notice, but one permissible method may be employed in respect of any one or more, and any other permissible method or methods may be employed in respect of any other or others.

(e) Notice to Person With Whom Communication is Unlawful. Whenever notice is required to be given, under any provision of law or of the Certificate of Incorporation or Bylaws of the corporation, to any person with whom communication is unlawful, the giving of such notice to such person shall not be required and there shall be no duty to apply to any governmental authority or agency for a license or permit to give such notice to such person. Any action or meeting which shall be taken or held without notice to any such person with whom communication is unlawful shall have the same force and effect as if such notice had been duly given. In the event that the action taken by the corporation is such as to require the filing of a certificate under any provision of the DGCL, the certificate shall state, if such is the fact and if notice is required, that notice was given to all persons entitled to receive notice except such persons with whom communication is unlawful.

(f) Notice to Stockholders Sharing an Address. Except as otherwise prohibited under the DGCL, any notice given under the provisions of the DGCL, the Certificate

of Incorporation or the Bylaws shall be effective if given by a single written notice to stockholders who share an address if consented to by the stockholders at that address to whom such notice is given. Such consent shall have been deemed to have been given if such stockholder fails to object in writing to the corporation within 60 days of having been given notice by the corporation of its intention to send the single notice. Any consent shall be revocable by the stockholder by written notice to the corporation.

ARTICLE XIII

AMENDMENTS

Section 47. Amendments. Subject to the limitations set forth in Section 45(h) of these Bylaws or the provisions of the Certificate of Incorporation, the Board of Directors is expressly empowered to adopt, amend or repeal the Bylaws of the corporation. Any adoption, amendment or repeal of the Bylaws of the corporation by the Board of Directors shall require the approval of a majority of the authorized number of directors. The stockholders also shall have power to adopt, amend or repeal the Bylaws of the corporation; provided, ho*wever,* that, in addition to any vote of the holders of any class or series of stock of the corporation required by law or by the Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least 66 2/3% of the voting power of all of the then-outstanding shares of the capital stock of the corporation entitled to vote generally in the election of directors, voting together as a single class.

ARTICLE XIV

LOANS TO OFFICERS OR EMPLOYEES

Section 48. Loans to Officers or Employees. Except as otherwise prohibited by applicable law, the corporation may lend money to, or guarantee any obligation of, or otherwise assist any officer or other employee of the corporation or of its subsidiaries, including any officer or employee who is a director of the corporation or its subsidiaries, whenever, in the judgment of the Board of Directors, such loan, guarantee or assistance may reasonably be expected to benefit the corporation. The loan, guarantee or other assistance may be with or without interest and may be unsecured, or secured in such manner as the Board of Directors shall approve, including, without limitation, a pledge of shares of stock of the corporation. Nothing in these Bylaws shall be deemed to deny, limit or restrict the powers of guaranty or warranty of the corporation at common law or under any statute.

ARTICLE XV

FORUM FOR ADJUDICATION OF DISPUTES

Section 49. Forum for Adjudication of Disputes. Unless the corporation consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (a) any derivative action or proceeding brought on behalf of the corporation, (b) any action asserting a claim of breach of a fiduciary duty owed by any director or officer of the corporation or the corporation's stockholders, (c) any action asserting a claim against the corporation arising pursuant to any provision of the DGCL or the corporation's Certificate of Incorporation or Bylaws, or (d) any action asserting a claim against the corporation governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of capital stock of the corporation shall be deemed to have notice of and to have consented to the provisions of this Section 49.

Exhibit 10.1

INDEMNITY AGREEMENT

THIS INDEMNITY AGREEMENT (this ***"Agreement"***) dated as of , is made by and between **CELLADON CORPORATION**, a Delaware corporation (the ***"Company"***), and (***"Indemnitee"***).

RECITALS

A. The Company desires to attract and retain the services of highly qualified individuals as directors, officers, employees and agents.

B. The Company's Amended and Restated Bylaws (the ***"Bylaws"***) require that the Company indemnify its directors, and empowers the Company to indemnify its officers, employees and agents, as authorized by the Delaware General Corporation Law, as amended (the ***"DGCL"***), under which the Company is organized, and such Bylaws expressly provide that the indemnification provided therein is not exclusive and contemplates that the Company may enter into separate agreements with its directors, officers and other persons to set forth specific indemnification provisions.

C. Indemnitee does not regard the protection currently provided by applicable law, the Company's governing documents and available insurance as adequate under the present circumstances, and the Company has determined that Indemnitee and other directors, officers, employees and agents of the Company may not be willing to serve or continue to serve in such capacities without additional protection.

D. The Company desires and has requested Indemnitee to serve or continue to serve as a director, officer, employee or agent of the Company, as the case may be, and has proffered this Agreement to Indemnitee as an additional inducement to serve in such capacity.

E. Indemnitee is willing to serve, or to continue to serve, as a director, officer, employee or agent of the Company, as the case may be, if Indemnitee is furnished the indemnity provided for herein by the Company.

AGREEMENT

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, the parties hereto, intending to be legally bound, hereby agree as follows:

1. Definitions.

(a) Agent. For purposes of this Agreement, the term "agent" of the Company means any person who: (i) is or was a director**,** officer, employee or other fiduciary of the Company or a subsidiary of the Company; or (ii) is or was serving at the request or for the convenience of, or representing the interests of, the Company or a subsidiary of the Company, as a director, officer, employee or other fiduciary of a foreign or domestic corporation, partnership, joint venture, trust or other enterprise.

(b) Expenses. For purposes of this Agreement, the term "expenses" shall be broadly construed and shall include, without limitation, all direct and indirect costs of any type or nature whatsoever (including, without limitation, all attorneys', witness, or other professional fees and related disbursements, and other out-of-pocket costs of whatever nature), actually and reasonably incurred by Indemnitee in connection with the investigation, defense or appeal of a proceeding or establishing or enforcing a right to indemnification under this Agreement, the DGCL or otherwise, and amounts paid in settlement by or on behalf of Indemnitee, but shall not include any judgments, fines or penalties actually levied against Indemnitee for such individual's violations of law. The term "expenses" shall also include reasonable compensation for time spent by Indemnitee for which he is not compensated by the Company or any subsidiary or third party (i) for any period during which Indemnitee is not an agent, in the employment of, or providing services for compensation to, the Company or any subsidiary; and (ii) if the rate of compensation and estimated time involved is approved by the directors of the Company who are not parties to any action with respect to which expenses are incurred, for Indemnitee while an agent of, employed by, or providing services for compensation to, the Company or any subsidiary.

(c) Proceedings. For purposes of this Agreement, the term "proceeding" shall be broadly construed and shall include, without limitation, any threatened, pending, or completed action, suit, arbitration, alternate dispute resolution mechanism, investigation, inquiry, administrative hearing or any other actual, threatened or completed proceeding, whether brought in the right of the Company or otherwise and whether of a civil, criminal, administrative or investigative nature, and whether formal or informal in any case, in which Indemnitee was, is or will be involved as a party or otherwise by reason of: (i) the fact that Indemnitee is or was a director or officer of the Company; (ii) any action taken by Indemnitee or any action on Indemnitee's part while acting as director, officer, employee or agent of the Company; or (iii) the fact that Indemnitee is or was serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise, and in any such case described above, whether or not serving in any such capacity at the time any liability or expense is incurred for which indemnification, reimbursement, or advancement of expenses may be provided under this Agreement.

(d) Subsidiary. For purposes of this Agreement, the term "subsidiary" means any corporation or limited liability company of which more than 50% of the outstanding voting securities or equity interests are owned, directly or indirectly, by the Company and one or more of its subsidiaries, and any other corporation, limited liability company, partnership, joint venture, trust, employee benefit plan or other enterprise of which Indemnitee is or was serving at the request of the Company as a director, officer, employee, agent or fiduciary.

(e) Independent Counsel. For purposes of this Agreement, the term "independent counsel" means a law firm, or a partner (or, if applicable, member) of such a law firm, that is experienced in matters of corporation law and neither presently is, nor in the past five (5) years has been, retained to represent: (i) the Company or Indemnitee in any matter material to either such party, or (ii) any other party to the proceeding giving rise to a claim for indemnification hereunder. Notwithstanding the foregoing, the term "independent counsel" shall not include any person who, under the applicable standards of professional conduct then

prevailing, would have a conflict of interest in representing either the Company or Indemnitee in an action to determine Indemnitee's rights under this Agreement.

2. Agreement to Serve. Indemnitee will serve, or continue to serve, as a director, officer, employee or agent of the Company or any subsidiary, as the case may be, faithfully and to the best of his or her ability, at the will of such corporation (or under separate agreement, if such agreement exists), in the capacity Indemnitee currently serves as an agent of such corporation, so long as Indemnitee is duly appointed or elected and qualified in accordance with the applicable provisions of the bylaws or other applicable charter documents of such corporation, or until such time as Indemnitee tenders his or her resignation in writing; provided, however, that nothing contained in this Agreement is intended as an employment agreement between Indemnitee and the Company or any of its subsidiaries or to create any right to continued employment of Indemnitee with the Company or any of its subsidiaries in any capacity.

The Company acknowledges that it has entered into this Agreement and assumes the obligations imposed on it hereby, in addition to and separate from its obligations to Indemnitee under the Bylaws, to induce Indemnitee to serve, or continue to serve, as a director, officer, employee or agent of the Company, and the Company acknowledges that Indemnitee is relying upon this Agreement in serving as a director, officer, employee or agent of the Company.

3. Indemnification.

(a) Indemnification in Third Party Proceedings. Subject to Section 10 below, the Company shall indemnify Indemnitee to the fullest extent permitted by the DGCL, as the same may be amended from time to time (but, only to the extent that such amendment permits Indemnitee to broader indemnification rights than the DGCL permitted prior to adoption of such amendment), if Indemnitee is a party to or threatened to be made a party to or otherwise involved in any proceeding, for any and all expenses, actually and reasonably incurred by Indemnitee in connection with the investigation, defense, settlement or appeal of such proceeding.

(b) Indemnification in Derivative Actions and Direct Actions by the Company. Subject to Section 10 below, the Company shall indemnify Indemnitee to the fullest extent permitted by the DGCL, as the same may be amended from time to time (but, only to the extent that such amendment permits Indemnitee to broader indemnification rights than the DGCL permitted prior to adoption of such amendment), if Indemnitee is a party to or threatened to be made a party to or otherwise involved in any proceeding by or in the right of the Company to procure a judgment in its favor, against any and all expenses actually and reasonably incurred by Indemnitee in connection with the investigation, defense, settlement, or appeal of such proceedings.

(c) Fund Indemnitors. The Company hereby acknowledges that the Indemnitee has or may have in the future certain rights to indemnification, advancement of expenses and/or insurance provided by entities and/or organizations other than the Company (collectively, the ***"Fund Indemnitors"***). In the event that the Indemnitee is, or is threatened to be made, a party to or a participant in any proceeding to the extent resulting from any claim

based on the Indemnitee's service to the Company as a director or other fiduciary of the Company, then the Company shall (i) be an indemnitor of first resort (*i.e.*, its obligations to Indemnitee are primary and any obligation of the Fund Indemnitors to advance expenses or to provide indemnification for the same expenses or liabilities incurred by Indemnitee are secondary), (ii) be required to advance reasonable expenses incurred by Indemnitee, and (iii) be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement and any provision of the Bylaws or the Company's Amended and Restated Certificate of Incorporation (the ***"Certificate of Incorporation"***) (or any other agreement between the Company and Indemnitee), without regard to any rights Indemnitee may have against the Fund Indemnitors. The Company irrevocably waives, relinquishes and releases the Fund Indemnitors from any and all claims against the Fund Indemnitors for contribution, subrogation or any other recovery of any kind in respect thereof. No advancement or payment by the Fund Indemnitors on behalf of Indemnitee with respect to any claim for which Indemnitee has sought indemnification from the Company shall affect the foregoing and the Fund Indemnitors shall have a right of contribution or be subrogated to the extent of such advancement or payment to all of the rights of recovery of Indemnitee against the Company. The Fund Indemnitors are third party beneficiaries of the terms of this Section.

4. Indemnification of Expenses of Successful Party. Notwithstanding any other provision of this Agreement, to the extent that Indemnitee has been successful on the merits or otherwise in defense of any proceeding or in defense of any claim, issue or matter therein, including the dismissal of any action without prejudice, the Company shall indemnify Indemnitee against all expenses actually and reasonably incurred in connection with the investigation, defense or appeal of such proceeding.

5. Partial Indemnification. If Indemnitee is entitled under any provision of this Agreement to indemnification by the Company for some or a portion of any expenses actually and reasonably incurred by Indemnitee in the investigation, defense, settlement or appeal of a proceeding, but is precluded by applicable law or the specific terms of this Agreement to indemnification for the total amount thereof, the Company shall nevertheless indemnify Indemnitee for the portion thereof to which Indemnitee is entitled.

6. Advancement of Expenses. To the extent not prohibited by law, the Company shall advance the expenses incurred by Indemnitee in connection with any proceeding, and such advancement shall be made within twenty (20) days after the receipt by the Company of a statement or statements requesting such advances (which shall include invoices received by Indemnitee in connection with such expenses but, in the case of invoices in connection with legal services, any references to legal work performed or to expenditures made that would cause Indemnitee to waive any privilege accorded by applicable law shall not be included with the invoice) and upon request of the Company, an undertaking to repay the advancement of expenses if and to the extent that it is ultimately determined by a court of competent jurisdiction in a final judgment, not subject to appeal, that Indemnitee is not entitled to be indemnified by the Company. Advances shall be unsecured, interest free and without regard to Indemnitee's ability to repay the expenses. Advances shall include any and all expenses actually and reasonably incurred by Indemnitee pursuing an action to enforce Indemnitee's right to indemnification under this Agreement, or otherwise and this right of advancement, including expenses incurred

preparing and forwarding statements to the Company to support the advances claimed. Indemnitee acknowledges that the execution and delivery of this Agreement shall constitute an undertaking providing that Indemnitee shall, to the fullest extent required by law, repay the advance if and to the extent that it is ultimately determined by a court of competent jurisdiction in a final judgment, not subject to appeal, that Indemnitee is not entitled to be indemnified by the Company. The right to advances under this Section shall continue until final disposition of any proceeding, including any appeal therein. This Section 6 shall not apply to any claim made by Indemnitee for which indemnity is excluded pursuant to Section 10(b).

7. Notice and Other Indemnification Procedures.

(a) Notification of Proceeding. Indemnitee will notify the Company in writing promptly upon being served with any summons, citation, subpoena, complaint, indictment, information or other document relating to any proceeding or matter which may be subject to indemnification or advancement of expenses covered hereunder. The failure of Indemnitee to so notify the Company shall not relieve the Company of any obligation which it may have to Indemnitee under this Agreement or otherwise.

(b) Request for Indemnification and Indemnification Payments. Indemnitee shall notify the Company promptly in writing upon receiving notice of any demand, judgment or other requirement for payment that Indemnitee reasonably believes to be subject to indemnification under the terms of this Agreement, and shall request payment thereof by the Company. Indemnification payments requested by Indemnitee under Section 3 hereof shall be made by the Company no later than sixty (60) days after receipt of the written request of Indemnitee. Claims for advancement of expenses shall be made under the provisions of Section 6 herein.

(c) Application for Enforcement. In the event the Company fails to make timely payments as set forth in Sections 6 or 7(b) above, Indemnitee shall have the right to apply to any court of competent jurisdiction for the purpose of enforcing Indemnitee's right to indemnification or advancement of expenses pursuant to this Agreement. In such an enforcement hearing or proceeding, the burden of proof shall be on the Company to prove that indemnification or advancement of expenses to Indemnitee is not required under this Agreement or permitted by applicable law. Any determination by the Company (including its Board of Directors, stockholders or independent counsel) that Indemnitee is not entitled to indemnification hereunder, shall not be a defense by the Company to the action nor create any presumption that Indemnitee is not entitled to indemnification or advancement of expenses hereunder.

(d) Indemnification of Certain Expenses. The Company shall indemnify Indemnitee against all expenses incurred in connection with any hearing or proceeding under this Section 7 unless the Company prevails in such hearing or proceeding on the merits in all material respects.

8. Assumption of Defense. In the event the Company shall be requested by Indemnitee to pay the expenses of any proceeding, the Company, if appropriate, shall be entitled to assume the defense of such proceeding, or to participate to the extent permissible in such proceeding, with counsel reasonably acceptable to Indemnitee. Upon assumption of the defense

by the Company and the retention of such counsel by the Company, the Company shall not be liable to Indemnitee under this Agreement for any fees of counsel subsequently incurred by Indemnitee with respect to the same proceeding, provided that Indemnitee shall have the right to employ separate counsel in such proceeding at Indemnitee's sole cost and expense. Notwithstanding the foregoing, if Indemnitee's counsel delivers a written notice to the Company stating that such counsel has reasonably concluded that there may be a conflict of interest between the Company and Indemnitee in the conduct of any such defense or the Company shall not, in fact, have employed counsel or otherwise actively pursued the defense of such proceeding within a reasonable time, then in any such event the fees and expenses of Indemnitee's counsel to defend such proceeding shall be subject to the indemnification and advancement of expenses provisions of this Agreement.

9. Insurance. To the extent that the Company maintains an insurance policy or policies providing liability insurance for directors, officers, employees, or agents of the Company or of any subsidiary (***"D&O Insurance"***), Indemnitee shall be covered by such policy or policies in accordance with its or their terms to the maximum extent of the coverage available for any such director, officer, employee or agent under such policy or policies. If, at the time of the receipt of a notice of a claim pursuant to the terms hereof, the Company has D&O Insurance in effect, the Company shall give prompt notice of the commencement of such proceeding to the insurers in accordance with the procedures set forth in the respective policies. The Company shall thereafter take all necessary or desirable action to cause such insurers to pay, on behalf of Indemnitee, all amounts payable as a result of such proceeding in accordance with the terms of such policies.

[Alternative: To the extent that the Company maintains an insurance policy or policies providing liability insurance for directors, officers, employees, or agents of the Company or of any other Enterprise, Indemnitee shall be covered by such policy or policies in accordance with its or their terms to the maximum extent of the coverage available for any such director, officer, employee or agent under such policy or policies. If, at the time of the receipt of a notice of a claim pursuant to the terms hereof, the Company has director and officer liability insurance in effect, the Company shall give prompt notice of the commencement of such proceeding to the insurers in accordance with the procedures set forth in the respective policies. The Company shall thereafter take all necessary or desirable action to cause such insurers to pay, on behalf of the Indemnitee, all amounts payable as a result of such proceeding in accordance with the terms of such policies.]

10. Exceptions.

(a) Certain Matters. Any provision herein to the contrary notwithstanding, the Company shall not be obligated pursuant to the terms of this Agreement to indemnify Indemnitee on account of any proceeding with respect to (i) remuneration paid to Indemnitee if it is determined by final judgment or other final adjudication that such remuneration was in violation of law (and, in this respect, both the Company and Indemnitee have been advised that the Securities and Exchange Commission believes that indemnification for liabilities arising under the federal securities laws is against public policy and is, therefore, unenforceable and that claims for indemnification should be submitted to appropriate courts for adjudication, as indicated in Section 10(d) below); (ii) a final judgment rendered against Indemnitee for an

accounting, disgorgement or repayment of profits made from the purchase or sale by Indemnitee of securities of the Company against Indemnitee or in connection with a settlement by or on behalf of Indemnitee to the extent it is acknowledged by Indemnitee and the Company that such amount paid in settlement resulted from Indemnitee's conduct from which Indemnitee received monetary personal profit, pursuant to the provisions of Section 16(b) of the Securities Exchange Act of 1934, as amended, or other provisions of any federal, state or local statute or rules and regulations thereunder; (iii) a final judgment or other final adjudication that Indemnitee's conduct was in bad faith, knowingly fraudulent or deliberately dishonest or constituted willful misconduct (but only to the extent of such specific determination); or (iv) on account of conduct that is established by a final judgment as constituting a breach of Indemnitee's duty of loyalty to the Company or resulting in any personal profit or advantage to which Indemnitee is not legally entitled. For purposes of the foregoing sentence, a final judgment or other adjudication may be reached in either the underlying proceeding or action in connection with which indemnification is sought or a separate proceeding or action to establish rights and liabilities under this Agreement.

(b) Claims Initiated by Indemnitee. Any provision herein to the contrary notwithstanding, the Company shall not be obligated to indemnify or advance expenses to Indemnitee with respect to proceedings or claims initiated or brought by Indemnitee against the Company or its directors, officers, employees or other agents and not by way of defense, except (i) with respect to proceedings brought to establish or enforce a right to indemnification under this Agreement or under any other agreement, provision in the Bylaws or Certificate of Incorporation or applicable law, or (ii) with respect to any other proceeding initiated by Indemnitee that is either approved by the Board of Directors or Indemnitee's participation is required by applicable law. However, indemnification or advancement of expenses may be provided by the Company in specific cases if the Board of Directors determines it to be appropriate.

(c) Unauthorized Settlements. Any provision herein to the contrary notwithstanding, the Company shall not be obligated pursuant to the terms of this Agreement to indemnify Indemnitee under this Agreement for any amounts paid in settlement of a proceeding effected without the Company's written consent. Neither the Company nor Indemnitee shall unreasonably withhold consent to any proposed settlement; provided, however, that the Company may in any event decline to consent to (or to otherwise admit or agree to any liability for indemnification hereunder in respect of) any proposed settlement if the Company is also a party in such proceeding and determines in good faith that such settlement is not in the best interests of the Company and its stockholders.

(d) Securities Act Liabilities. Any provision herein to the contrary notwithstanding, the Company shall not be obligated pursuant to the terms of this Agreement to indemnify Indemnitee or otherwise act in violation of any undertaking appearing in and required by the rules and regulations promulgated under the Securities Act of 1933, as amended (the ***"Act"***), or in any registration statement filed with the SEC under the Act. Indemnitee acknowledges that paragraph (h) of Item 512 of Regulation S-K currently generally requires the Company to undertake in connection with any registration statement filed under the Act to submit the issue of the enforceability of Indemnitee's rights under this Agreement in connection with any liability under the Act on public policy grounds to a court of appropriate jurisdiction

and to be governed by any final adjudication of such issue. Indemnitee specifically agrees that any such undertaking shall supersede the provisions of this Agreement and to be bound by any such undertaking.

11. Nonexclusivity and Survival of Rights. The provisions for indemnification and advancement of expenses set forth in this Agreement shall not be deemed exclusive of any other rights which Indemnitee may at any time be entitled under any provision of applicable law, the Certificate of Incorporation, Bylaws or other agreements, both as to action in Indemnitee's official capacity and Indemnitee's action as an agent of the Company, in any court in which a proceeding is brought, and Indemnitee's rights hereunder shall continue after Indemnitee has ceased acting as an agent of the Company and shall inure to the benefit of the heirs, executors, administrators and assigns of Indemnitee. The obligations and duties of the Company to Indemnitee under this Agreement shall be binding on the Company and its successors and assigns until terminated in accordance with its terms. The Company shall require any successor (whether direct or indirect, by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Company, expressly to assume and agree to perform this Agreement in the same manner and to the same extent that the Company would be required to perform if no such succession had taken place.

No amendment, alteration or repeal of this Agreement or of any provision hereof shall limit or restrict any right of Indemnitee under this Agreement in respect of any action taken or omitted by such Indemnitee in his or her corporate status prior to such amendment, alteration or repeal. To the extent that a change in the DGCL, whether by statute or judicial decision, permits greater indemnification or advancement of expenses than would be afforded currently under the Certificate of Incorporation, Bylaws and this Agreement, it is the intent of the parties hereto that Indemnitee shall enjoy by this Agreement the greater benefits so afforded by such change. No right or remedy herein conferred is intended to be exclusive of any other right or remedy, and every other right and remedy shall be cumulative and in addition to every other right and remedy given hereunder or now or hereafter existing at law or in equity or otherwise. The assertion or employment of any right or remedy hereunder, or otherwise, by Indemnitee shall not prevent the concurrent assertion or employment of any other right or remedy by Indemnitee.

12. Subrogation. In the event of payment under this Agreement, the Company shall be subrogated to the extent of such payment to all of the rights of recovery of Indemnitee, who, at the request and expense of the Company, shall execute all papers required and shall do everything that may be reasonably necessary to secure such rights, including the execution of such documents necessary to enable the Company effectively to bring suit to enforce such rights.

13. Interpretation of Agreement. It is understood that the parties hereto intend this Agreement to be interpreted and enforced so as to provide indemnification to Indemnitee to the fullest extent now or hereafter permitted by law.

14. Severability. If any provision of this Agreement shall be held to be invalid, illegal or unenforceable for any reason whatsoever, (a) the validity, legality and enforceability of the remaining provisions of the Agreement (including without limitation, all portions of any paragraphs of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that are not themselves invalid, illegal or unenforceable) shall not in any way be

affected or impaired thereby; and (b) to the fullest extent possible, the provisions of this Agreement (including, without limitation, all portions of any paragraph of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that are not themselves invalid, illegal or unenforceable) shall be construed so as to give effect to the intent manifested by the provision held invalid, illegal or unenforceable and to give effect to Section 14 hereof.

15. Amendment and Waiver. No supplement, modification, amendment, or cancellation of this Agreement shall be binding unless executed in writing by the parties hereto. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision hereof (whether or not similar) nor shall such waiver constitute a continuing waiver.

16. Notice. Except as otherwise provided herein, any notice or demand which, by the provisions hereof, is required or which may be given to or served upon the parties hereto shall be in writing and, if by telegram, telecopy or telex, shall be deemed to have been validly served, given or delivered when sent, if by overnight delivery, courier or personal delivery, shall be deemed to have been validly served, given or delivered upon actual delivery and, if mailed, shall be deemed to have been validly served, given or delivered three (3) business days after deposit in the United States mail, as registered or certified mail, with proper postage prepaid and addressed to the party or parties to be notified at the addresses set forth on the signature page of this Agreement (or such other address(es) as a party may designate for itself by like notice). If to the Company, notices and demands shall be delivered to the attention of the Secretary of the Company.

17. Governing Law. This Agreement shall be governed exclusively by and construed according to the laws of the State of Delaware, as applied to contracts between Delaware residents entered into and to be performed entirely within Delaware.

18. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall for all purposes be deemed to be an original but all of which together shall constitute but one and the same Agreement. Only one such counterpart need be produced to evidence the existence of this Agreement.

19. Headings. The headings of the sections of this Agreement are inserted for convenience only and shall not be deemed to constitute part of this Agreement or to affect the construction hereof.

20. Entire Agreement. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior agreements, understandings and negotiations, written and oral, between the parties with respect to the subject matter of this Agreement; provided, however, that this Agreement is a supplement to and in furtherance of the Certificate of Incorporation, Bylaws, the DGCL and any other applicable law, and shall not be deemed a substitute therefor, and does not diminish or abrogate any rights of Indemnitee thereunder.

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IN WITNESS WHEREOF, the parties hereto have entered into this Agreement effective as of the date first above written.

CELLADON CORPORATION

By: _____
Name: _____
Title: _____

INDEMNITEE

_____
Signature of Indemnitee

_____
Print or Type Name of Indemnitee

CELLADON CORPORATION
2001 STOCK OPTION PLAN

1. ESTABLISHMENT, PURPOSE AND TERM OF PLAN.

1.1 Establishment. The Celladon Corporation 2001 Stock Option Plan (the ***"Plan"***) is hereby established effective as of December 19, 2001.

1.2 Purpose. The purpose of the Plan is to advance the interests of the Participating Company Group and its shareholders by providing an incentive to attract, retain and reward persons performing services for the Participating Company Group and by motivating such persons to contribute to the growth and profitability of the Participating Company Group.

1.3 Term of Plan. The Plan shall continue in effect until the earlier of its termination by the Board or the date on which all of the shares of Stock available for issuance under the Plan have been issued and all restrictions on such shares under the terms of the Plan and the agreements evidencing Options granted under the Plan have lapsed. However, all Options shall be granted, if at all, within ten (10) years from the earlier of the date the Plan is adopted by the Board or the date the Plan is duly approved by the shareholders of the Company.

2. DEFINITIONS AND CONSTRUCTION.

2.1 Definitions. Whenever used herein, the following terms shall have their respective meanings set forth below:

(a) *"Board"* means the Board of Directors of the Company. If one or more Committees have been appointed by the Board to administer the Plan, ***"Board"*** also means such Committee(s).

(b) *"Code"* means the Internal Revenue Code of 1986, as amended, and any applicable regulations promulgated thereunder.

(c) *"Committee"* means the Compensation Committee or other committee of the Board duly appointed to administer the Plan and having such powers as shall be specified by the Board. Unless the powers of the Committee have been specifically limited, the Committee shall have all of the powers of the Board granted herein, including, without limitation, the power to amend or terminate the Plan at any time, subject to the terms of the Plan and any applicable limitations imposed by law.

(d) *"Company"* means Celladon Corporation, a California corporation, or any successor corporation thereto.

(e) *"Consultant"* means a person engaged to provide consulting or advisory services (other than as an Employee or a Director) to a participating Company, provided that the identity of such person, the nature of such services or the entity to which such services are provided would not preclude the Company from offering or selling securities to such person pursuant to the Plan in reliance on either the exemption from registration provided by

Rule 701 under the Securities Act or, if the Company is required to file reports pursuant to Section 13 or 15(d) of the Exchange Act, registration on a Form S-8 Registration Statement under the Securities Act.

(f) ***"Director"*** means a member of the Board or of the board of directors of any other Participating Company.

(g) ***"Disability"*** means the inability of the Optionee, in the opinion of a qualified physician acceptable to the Company, to perform the major duties of the Optionee's position with the Participating Company Group because of the sickness or injury of the Optionee.

(h) ***"Employee"*** means any person treated as an employee (including an Officer or a Director who is also treated as an employee) in the records of a Participating Company and, with respect to any Incentive Stock Option granted to such person, who is an employee for purposes of Section 422 of the Code; provided, however, that neither service as a Director nor payment of a director's fee shall be sufficient to constitute employment for purposes of the Plan. The Company shall determine in good faith and in the exercise of its discretion whether an individual has become or has ceased to be an Employee and the effective date of such individual's employment or termination of employment, as the case may be. For purposes of an individual's rights, if any, under the Plan as of the time of the Company's determination, all such determinations by the Company shall be final, binding and conclusive, notwithstanding that the Company or any court of law or governmental agency subsequently makes a contrary determination.

(i) ***"Exchange Act"*** means the Securities Exchange Act of 1934, as amended.

(j) ***"Fair Market Value"*** means, as of any date, the value of a share of Stock or other property as determined by the Board, in its discretion, or by the Company, in its discretion, if such determination is expressly allocated to the Company herein, subject to the following:

(i) If, on such date, the Stock is listed on a national or regional securities exchange or market system, the Fair Market Value of a share of Stock shall be the closing price of a share of Stock (or the mean of the closing bid and asked prices of a share of Stock if the Stock is so quoted instead) as quoted on the Nasdaq National Market, The Nasdaq SmallCap Market or such other national or regional securities exchange or market system constituting the primary market for the Stock, as reported in The Wall Street Journal or such other source as the Company deems reliable. If the relevant date does not fall on a day on which the Stock has traded on such securities exchange or market system, the date on which the Fair Market Value shall be established shall be the last day on which the Stock was so traded prior to the relevant date, or such other appropriate day as shall be determined by the Board, in its discretion.

(ii) If, on such date, the Stock is not listed on a national or regional securities exchange or market system, the Fair Market Value of a share of Stock shall be

as determined by the Board in good faith without regard to any restriction other than a restriction which, by its terms, will never lapse.

(k) *"Incentive Stock Option"* means an Option intended to be (as set forth in the Option Agreement) and which qualifies as an incentive stock option within the meaning of Section 422(b) of the Code.

(l) *"Insider"* means an Officer, a Director of the Company or other person whose transactions in Stock are subject to Section 16 of the Exchange Act.

(m) *"Nonstatutory Stock Option"* means an Option not intended to be (as set forth in the Option Agreement) or which does not qualify as an Incentive Stock Option.

(n) *"Officer"* means any person designated by the Board as an officer of the Company.

(o) *"Option"* means a right to purchase Stock pursuant to the terms and conditions of the Plan. An Option may be either an Incentive Stock Option or a Nonstatutory Stock Option.

(p) *"Option Agreement"* means a written agreement between the Company and an Optionee setting forth the terms, conditions and restrictions of the Option granted to the Optionee and any shares acquired upon the exercise thereof. An Option Agreement may consist of a form of "Notice of Grant of Stock Option" and a form of "Stock Option Agreement" incorporated therein by reference, or such other form or forms as the Board may approve from time to time.

(q) *"Optionee"* means a person who has been granted one or more Options.

(r) *"Parent Corporation"* means any present or future "parent corporation" of the Company, as defined in Section 424(e) of the Code.

(s) *"Participating Company"* means the Company or any Parent Corporation or Subsidiary Corporation.

(t) *"Participating Company Group"* means, at any point in time, all corporations collectively which are then Participating Companies.

(u) *"Rule 16b-3"* means Rule 16b-3 under the Exchange Act, as amended from time to time, or any successor rule or regulation.

(v) *"Securities Act"* means the Securities Act of 1933, as amended.

(w) *"Service"* means an Optionee's employment or service with the Participating Company Group, whether in the capacity of an Employee, a Director or a Consultant. An Optionee's Service shall not be deemed to have terminated merely because of a change in the capacity in which the Optionee renders Service to the Participating Company

Group or a change in the Participating Company for which the Optionee renders such Service, provided that there is no interruption or termination of the Optionee's Service. Furthermore, an Optionee's Service with the Participating Company Group shall not be deemed to have terminated if the Optionee takes any military leave, sick leave, or other bona fide leave of absence approved by the Company; provided, however, that if any such leave exceeds ninety (90) days, on the ninety-first (91st) day of such leave the Optionee's Service shall be deemed to have terminated unless the Optionee's right to return to Service with the Participating Company Group is guaranteed by statute or contract. Notwithstanding the foregoing, unless otherwise designated by the Company or required by law, a leave of absence shall not be treated as Service for purposes of determining vesting under the Optionee's Option Agreement. The Optionee's Service shall be deemed to have terminated either upon an actual termination of Service or upon the corporation for which the Optionee performs Service ceasing to be a Participating Company. Subject to the foregoing, the Company, in its discretion, shall determine whether the Optionee's Service has terminated and the effective date of such termination.

(x) *"Stock"* means the common stock of the Company, as adjusted from time to time in accordance with Section 4.2.

(y) *"Subsidiary Corporation"* means any present or future "subsidiary corporation" of the Company, as defined in Section 424(f) of the Code.

(z) *"Ten Percent Owner Optionee"* means an Optionee who, at the time an Option is granted to the Optionee, owns stock possessing more than ten percent (10%) of the total combined voting power of all classes of stock of a Participating Company within the meaning of Section 422(b)(6) of the Code.

2.2 Construction. Captions and titles contained herein are for convenience only and shall not affect the meaning or interpretation of any provision of the Plan. Except when otherwise indicated by the context, the singular shall include the plural and the plural shall include the singular. Use of the term "or" is not intended to be exclusive, unless the context clearly requires otherwise.

3. ADMINISTRATION.

3.1 Administration by the Board. The Plan shall be administered by the Board. All questions of interpretation of the Plan or of any Option shall be determined by the Board, and such determinations shall be final and binding upon all persons having an interest in the Plan or such Option.

3.2 Authority of Officers. Any Officer shall have the authority to act on behalf of the Company with respect to any matter, right, obligation, determination or election which is the responsibility of or which is allocated to the Company herein, provided the Officer has apparent authority with respect to such matter, right, obligation, determination or election.

3.3 Powers of the Board. In addition to any other powers set forth in the Plan and subject to the provisions of the Plan, the Board shall have the full and final power and authority, in its discretion:

(a) to determine the persons to whom, and the time or times at which, Options shall be granted and the number of shares of Stock to be subject to each Option;

(b) to designate Options as Incentive Stock Options or Nonstatutory Stock Options;

(c) to determine the Fair Market Value of shares of Stock or other property;

(d) to determine the terms, conditions and restrictions applicable to each Option (which need not be identical) and any shares acquired upon the exercise thereof, including, without limitation, (i) the exercise price of the Option, (ii) the method of payment for shares purchased upon the exercise of the Option, (iii) the method for satisfaction of any tax withholding obligation arising in connection with the Option or such shares, including by the withholding or delivery of shares of stock, (iv) the timing, terms and conditions of the exercisability of the Option or the vesting of any shares acquired upon the exercise thereof, (v) the time of the expiration of the Option, (vi) the effect of the Optionee's termination of Service with the Participating Company Group on any of the foregoing, and (vii) all other terms, conditions and restrictions applicable to the Option or such shares not inconsistent with the terms of the Plan;

(e) to approve one or more forms of Option Agreement;

(f) to amend, modify, extend, cancel or renew any Option or to waive any restrictions or conditions applicable to any Option or any shares acquired upon the exercise thereof;

(g) to accelerate, continue, extend or defer the exercisability of any Option or the vesting of any shares acquired upon the exercise thereof, including with respect to the period following an Optionee's termination of Service with the Participating Company Group;

(h) to prescribe, amend or rescind rules, guidelines and policies relating to the Plan, or to adopt supplements to, or alternative versions of, the Plan, including, without limitation, as the Board deems necessary or desirable to comply with the laws of, or to accommodate the tax policy or custom of, foreign jurisdictions whose citizens may be granted Options; and

(i) to correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Option Agreement and to make all other determinations and take such other actions with respect to the Plan or any Option as the Board may deem advisable to the extent not inconsistent with the provisions of the Plan or applicable law.

3.4 Administration with Respect to Insiders. With respect to participation by Insiders in the Plan, at any time that any class of equity security of the Company is registered pursuant to Section 12 of the Exchange Act, the Plan shall be administered in compliance with the requirements, if any, of Rule 16b-3.

3.5 Indemnification. In addition to such other rights of indemnification as they may have as members of the Board or officers or employees of the Participating Company Group, members of the Board and any officers or employees of the Participating Company Group to whom authority to act for the Board or the Company is delegated shall be indemnified by the Company against all reasonable expenses, including attorneys' fees, actually and necessarily incurred in connection with the defense of any action, suit or proceeding, or in connection with any appeal therein, to which they or any of them may be a party by reason of any action taken or failure to act under or in connection with the Plan, or any right granted hereunder, and against all amounts paid by them in settlement thereof (provided such settlement is approved by independent legal counsel selected by the Company) or paid by them in satisfaction of a judgment in any such action, suit or proceeding, except in relation to matters as to which it shall be adjudged in such action, suit or proceeding that such person is liable for gross negligence, bad faith or intentional misconduct in duties; provided, however, that within sixty (60) days after the institution of such action, suit or proceeding, such person shall offer to the Company, in writing, the opportunity at its own expense to handle and defend the same.

4. SHARES SUBJECT TO PLAN.

4.1 Maximum Number of Shares Issuable. Subject to adjustment as provided in Section 4.2, the maximum aggregate number of shares of Stock that may be issued under the Plan shall be Eight Million Six Hundred Eight Thousand Two Hundred Seven (8,608,207) and shall consist of authorized but unissued or reacquired shares of Stock or any combination thereof. If an outstanding Option for any reason expires or is terminated or canceled or if shares of Stock are acquired upon the exercise of an Option subject to a Company repurchase option and are repurchased by the Company at the Optionee's exercise price, the shares of Stock allocable to the unexercised portion of such Option or such repurchased shares of Stock shall again be available for issuance under the Plan. However, except as adjusted pursuant to Section 4.2, in no event shall more than Eight Million Six Hundred Eight Thousand Two Hundred Seven (8,608,207) shares of Stock be available for issuance pursuant to the exercise of Incentive Stock Options (the ***"ISO Share Issuance Limit"***). Notwithstanding the foregoing, at any such time as the offer and sale of securities pursuant to the Plan is subject to compliance with Section 260.140.45 of Title 10 of the California Code of Regulations (***"Section 260.140.45"***), the total number of shares of Stock issuable upon the exercise of all outstanding Options (together with options outstanding under any other stock option plan of the Company) and the total number of shares provided for under any stock bonus or similar plan of the Company shall not exceed thirty percent (30%) (or such other higher percentage limitation as may be approved by the shareholders of the Company pursuant to Section 260.140.45) of the then outstanding shares of the Company as calculated in accordance with the conditions and exclusions of Section 260.140.45.

4.2 Adjustments for Changes in Capital Structure. In the event of any stock dividend, stock split, reverse stock split, recapitalization, combination, reclassification or

similar change in the capital structure of the Company, appropriate adjustments shall be made in the number and class of shares subject to the Plan and to any outstanding Options, in the ISO Share Issuance Limit set forth in Section 4.1, and in the exercise price per share of any outstanding Options. If a majority of the shares which are of the same class as the shares that are subject to outstanding Options are exchanged for, converted into, or otherwise become (whether or not pursuant to an Ownership Change Event, as defined in Section 8.1) shares of another corporation (the ***"New Shares"***), the Board may unilaterally amend the outstanding Options to provide that such Options are exercisable for New Shares. In the event of any such amendment, the number of shares subject to, and the exercise price per share of, the outstanding Options shall be adjusted in a fair and equitable manner as determined by the Board, in its discretion. Notwithstanding the foregoing, any fractional share resulting from an adjustment pursuant to this Section 4.2 shall be rounded down to the nearest whole number, and in no event may the exercise price of any Option be decreased to an amount less than the par value, if any, of the stock subject to the Option. The adjustments determined by the Board pursuant to this Section 4.2 shall be final, binding and conclusive.

5. ELIGIBILITY AND OPTION LIMITATIONS.

5.1 Persons Eligible for Options. Options may be granted only to Employees, Consultants, and Directors. For purposes of the foregoing sentence, "Employees," "Consultants" and "Directors" shall include prospective Employees, prospective Consultants and prospective Directors to whom Options are granted in connection with written offers of an employment or other service relationship with the Participating Company Group. Eligible persons may be granted more than one (1) Option. However, eligibility in accordance with this Section shall not entitle any person to be granted an Option, or, having been granted an Option, to be granted an additional Option.

5.2 Option Grant Restrictions. Any person who is not an Employee on the effective date of the grant of an Option to such person may be granted only a Nonstatutory Stock Option. An Incentive Stock Option granted to a prospective Employee upon the condition that such person become an Employee shall be deemed granted effective on the date such person commences Service with a Participating Company, with an exercise price determined as of such date in accordance with Section 6.1.

5.3 Fair Market Value Limitation. To the extent that options designated as Incentive Stock Options (granted under all stock option plans of the Participating Company Group, including the Plan) become exercisable by an Optionee for the first time during any calendar year for stock having a Fair Market Value greater than One Hundred Thousand Dollars ($100,000), the portions of such options which exceed such amount shall be treated as Nonstatutory Stock Options. For purposes of this Section 5.3, options designated as Incentive Stock Options shall be taken into account in the order in which they were granted, and the Fair Market Value of stock shall be determined as of the time the option with respect to such stock is granted. If the Code is amended to provide for a different limitation from that set forth in this Section 5.3, such different limitation shall be deemed incorporated herein effective as of the date and with respect to such Options as required or permitted by such amendment to the Code. If an Option is treated as an Incentive Stock Option in part and as a Nonstatutory Stock Option in part by reason of the limitation set forth in this Section 5.3, the Optionee may designate which

portion of such Option the Optionee is exercising. In the absence of such designation, the Optionee shall be deemed to have exercised the Incentive Stock Option portion of the Option first. Separate certificates representing each such portion shall be issued upon the exercise of the Option.

6. TERMS AND CONDITIONS OF OPTIONS.

Options shall be evidenced by Option Agreements specifying the number of shares of Stock covered thereby, in such form as the Board shall from time to time establish. No Option or purported Option shall be a valid and binding obligation of the Company unless evidenced by a fully executed Option Agreement. Option Agreements may incorporate all or any of the terms of the Plan by reference and shall comply with and be subject to the following terms and conditions:

6.1 Exercise Price. The exercise price for each Option shall be established in the discretion of the Board; provided, however, that (a) the exercise price per share for an Incentive Stock Option shall be not less than the Fair Market Value of a share of Stock on the effective date of grant of the Option, (b) the exercise price per share for a Nonstatutory Stock Option shall be not less than eighty-five percent (85%) of the Fair Market Value of a share of Stock on the effective date of grant of the Option, and (c) no Option granted to a Ten Percent Owner Optionee shall have an exercise price per share less than one hundred ten percent (110%) of the Fair Market Value of a share of Stock on the effective date of grant of the Option. Notwithstanding the foregoing, an Option (whether an Incentive Stock Option or a Nonstatutory Stock Option) may be granted with an exercise price lower than the minimum exercise price set forth above if such Option is granted pursuant to an assumption or substitution for another option in a manner qualifying under the provisions of Section 424(a) of the Code.

6.2 Exercisability and Term of Options. Options shall be exercisable at such time or times, or upon such event or events, and subject to such terms, conditions, performance criteria and restrictions as shall be determined by the Board and set forth in the Option Agreement evidencing such Option; provided, however, that (a) no Option shall be exercisable after the expiration of ten (10) years after the effective date of grant of such Option, (b) no Incentive Stock Option granted to a Ten Percent Owner Optionee shall be exercisable after the expiration of five (5) years after the effective date of grant of such Option, (c) no Option granted to a prospective Employee, prospective Consultant or prospective Director may become exercisable prior to the date on which such person commences Service with a Participating Company, and (d) with the exception of an Option granted to an Officer, a Director or a Consultant, no Option shall become exercisable at a rate less than twenty percent (20%) per year over a period of five (5) years from the effective date of grant of such Option, subject to the Optionee's continued Service. Subject to the foregoing, unless otherwise specified by the Board in the grant of an Option, any Option granted hereunder shall terminate ten (10) years after the effective date of grant of the Option, unless earlier terminated in accordance with its provisions.

6.3 Payment of Exercise Price.

(a) ***Forms of Consideration Authorized.*** Except as otherwise provided below, payment of the exercise price for the number of shares of Stock being purchased

pursuant to any Option shall be made (i) in cash, by check or cash equivalent, (ii) by tender to the Company, or attestation to the ownership, of shares of Stock owned by the Optionee having a Fair Market Value not less than the exercise price, (iii) by delivery of a properly executed notice together with irrevocable instructions to a broker providing for the assignment to the Company of the proceeds of a sale or loan with respect to some or all of the shares being acquired upon the exercise of the Option (including, without limitation, through an exercise complying with the provisions of Regulation T as promulgated from time to time by the Board of Governors of the Federal Reserve System) (a ***"Cashless Exercise"***), (iv) provided that the Optionee is an Employee (unless otherwise not prohibited by law, including, without limitation, any regulation promulgated by the Board of Governors of the Federal Reserve System) and in the Company's sole discretion at the time the Option is exercised, by delivery of the Optionee's promissory note in a form approved by the Company for the aggregate exercise price, provided that, if the Company is incorporated in the State of Delaware, the Optionee shall pay in cash that portion of the aggregate exercise price not less than the par value of the shares being acquired, (v) by such other consideration as may be approved by the Board from time to time to the extent permitted by applicable law, or (vi) by any combination thereof. The Board may at any time or from time to time, by approval of or by amendment to the standard forms of Option Agreement described in Section 7, or by other means, grant Options which do not permit all of the foregoing forms of consideration to be used in payment of the exercise price or which otherwise restrict one or more forms of consideration.

(b) ***Limitations on Forms of Consideration.***

(i) Tender of Stock. Notwithstanding the foregoing, an Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock to the extent such tender or attestation would constitute a violation of the provisions of any law, regulation or agreement restricting the redemption of the Company's stock. Unless otherwise provided by the Board, an Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock unless such shares either have been owned by the Optionee for more than six (6) months (and not used for another Option exercise by attestation during such period) or were not acquired, directly or indirectly, from the Company.

(ii) Cashless Exercise. The Company reserves, at any and all times, the right, in the Company's sole and absolute discretion, to establish, decline to approve or terminate any program or procedures for the exercise of Options by means of a Cashless Exercise.

(iii) Payment by Promissory Note. No promissory note shall be permitted if the exercise of an Option using a promissory note would be a violation of any law. Any permitted promissory note shall be on such terms as the Board shall determine. The Board shall have the authority to permit or require the Optionee to secure any promissory note used to exercise an Option with the shares of Stock acquired upon the exercise of the Option or with other collateral acceptable to the Company. Unless otherwise provided by the Board, if the Company at any time is subject to the regulations promulgated by the Board of Governors of the Federal Reserve System or any other governmental entity affecting the extension of credit in connection with the Company's securities, any promissory note shall comply with such

applicable regulations, and the Optionee shall pay the unpaid principal and accrued interest, if any, to the extent necessary to comply with such applicable regulations.

6.4 Tax Withholding. The Company shall have the right, but not the obligation, to deduct from the shares of Stock issuable upon the exercise of an Option, or to accept from the Optionee the tender of, a number of whole shares of Stock having a Fair Market Value, as determined by the Company, equal to all or any part of the federal, state, local and foreign taxes, if any, required by law to be withheld by the Participating Company Group with respect to such Option or the shares acquired upon the exercise thereof. Alternatively or in addition, in its discretion, the Company shall have the right to require the Optionee, through payroll withholding, cash payment or otherwise, including by means of a Cashless Exercise, to make adequate provision for any such tax withholding obligations of the Participating Company Group arising in connection with the Option or the shares acquired upon the exercise thereof. The Fair Market Value of any shares of Stock withheld or tendered to satisfy any such tax withholding obligations shall not exceed the amount determined by the applicable minimum statutory withholding rates. The Company shall have no obligation to deliver shares of Stock or to release shares of Stock from an escrow established pursuant to the Option Agreement until the Participating Company Group's tax withholding obligations have been satisfied by the Optionee.

6.5 Repurchase Rights. Shares issued under the Plan may be subject to a right of first refusal, one or more repurchase options, or other conditions and restrictions as determined by the Board in its discretion at the time the Option is granted. The Company shall have the right to assign at any time any repurchase right it may have, whether or not such right is then exercisable, to one or more persons as may be selected by the Company. Upon request by the Company, each Optionee shall execute any agreement evidencing such transfer restrictions prior to the receipt of shares of Stock hereunder and shall promptly present to the Company any and all certificates representing shares of Stock acquired hereunder for the placement on such certificates of appropriate legends evidencing any such transfer restrictions.

6.6 Effect of Termination of Service.

(a) ***Option Exercisability.*** Subject to earlier termination of the Option as otherwise provided herein and unless otherwise provided by the Board in the grant of an Option and set forth in the Option Agreement, an Option shall be exercisable after an Optionee's termination of Service only during the applicable time period determined in accordance with this Section 6.6 and thereafter shall terminate:

(i) Disability. If the Optionee's Service terminates because of the Disability of the Optionee, the Option, to the extent unexercised and exercisable on the date on which the Optionee's Service terminated, may be exercised by the Optionee (or the Optionee's guardian or legal representative) at any time prior to the expiration of twelve (12) months (or such longer period of time as determined by the Board, in its discretion) after the date on which the Optionee's Service terminated, but in any event no later than the date of expiration of the Option's term as set forth in the Option Agreement evidencing such Option (the ***"Option Expiration Date"***).

(ii) Death. If the Optionee's Service terminates because of the death of the Optionee, the Option, to the extent unexercised and exercisable on the date on which the Optionee's Service terminated, may be exercised by the Optionee's legal representative or other person who acquired the right to exercise the Option by reason of the Optionee's death at any time prior to the expiration of twelve (12) months (or such longer period of time as determined by the Board, in its discretion) after the date on which the Optionee's Service terminated, but in any event no later than the Option Expiration Date. The Optionee's Service shall be deemed to have terminated on account of death if the Optionee dies within three (3) months (or such longer period of time as determined by the Board, in its discretion) after the Optionee's termination of Service.

(iii) Other Termination of Service. If the Optionee's Service terminates for any reason, except Disability or death, the Option, to the extent unexercised and exercisable by the Optionee on the date on which the Optionee's Service terminated, may be exercised by the Optionee at any time prior to the expiration of three (3) months (or such longer period of time as determined by the Board, in its discretion) after the date on which the Optionee's Service terminated, but in any event no later than the Option Expiration Date.

(b) ***Extension if Exercise Prevented by Law.*** Notwithstanding the foregoing, if the exercise of an Option within the applicable time periods set forth in Section 6.6(a) is prevented by the provisions of Section 10 below, the Option shall remain exercisable until three (3) months (or such longer period of time as determined by the Board, in its discretion) after the date the Optionee is notified by the Company that the Option is exercisable, but in any event no later than the Option Expiration Date.

(c) ***Extension if Optionee Subject to Section 16(b).*** Notwithstanding the foregoing, if a sale within the applicable time periods set forth in Section 6.6(a) of shares acquired upon the exercise of the Option would subject the Optionee to suit under Section 16(b) of the Exchange Act, the Option shall remain exercisable until the earliest to occur of (i) the tenth (10th) day following the date on which a sale of such shares by the Optionee would no longer be subject to such suit, (ii) the one hundred and ninetieth (190th) day after the Optionee's termination of Service, or (iii) the Option Expiration Date.

6.7 Transferability of Options. During the lifetime of the Optionee, an Option shall be exercisable only by the Optionee or the Optionee's guardian or legal representative. No Option shall be assignable or transferable by the Optionee, except by will or by the laws of descent and distribution. Notwithstanding the foregoing, to the extent permitted by the Board, in its discretion, and set forth in the Option Agreement evidencing such Option, a Nonstatutory Stock Option shall be assignable or transferable subject to the applicable limitations, if any, described in Section 260.140.41 of Title 10 of the California Code of Regulations, Rule 701 under the Securities Act, and the General Instructions to Form S-8 Registration Statement under the Securities Act.

7. STANDARD FORMS OF OPTION AGREEMENT.

7.1 Option Agreement. Unless otherwise provided by the Board at the time the Option is granted, an Option shall comply with and be subject to the terms and conditions set

forth in the form of Option Agreement approved by the Board concurrently with its adoption of the Plan and as amended from time to time.

7.2 Authority to Vary Terms. The Board shall have the authority from time to time to vary the terms of any standard form of Option Agreement described in this Section 7 either in connection with the grant or amendment of an individual Option or in connection with the authorization of a new standard form or forms; provided, however, that the terms and conditions of any such new, revised or amended standard form or forms of Option Agreement are not inconsistent with the terms of the Plan.

8. CHANGE IN CONTROL.

8.1 Definitions.

(a) An ***"Ownership Change Event"*** shall be deemed to have occurred if any of the following occurs with respect to the Company: (i) the direct or indirect sale or exchange in a single or series of related transactions by the shareholders of the Company of more than fifty percent (50%) of the voting stock of the Company; (ii) a merger or consolidation in which the Company is a party; (iii) the sale, exchange, or transfer of all or substantially all of the assets of the Company; or (iv) a liquidation or dissolution of the Company.

(b) A ***"Change in Control"*** shall mean an Ownership Change Event or a series of related Ownership Change Events (collectively, a ***"Transaction"***) wherein the shareholders of the Company immediately before the Transaction do not retain immediately after the Transaction, in substantially the same proportions as their ownership of shares of the Company's voting stock immediately before the Transaction, direct or indirect beneficial ownership of more than fifty percent (50%) of the total combined voting power of the outstanding voting securities of the Company or, in the case of a Transaction described in Section 8.l(a)(iii), the corporation or other business entity to which the assets of the Company were transferred (the ***"Transferee"***), as the case may be. For purposes of the preceding sentence, indirect beneficial ownership shall include, without limitation, an interest resulting from ownership of the voting securities of one or more corporations or other business entities which own the Company or the Transferee, as the case may be, either directly or through one or more subsidiary corporations or other business entities. The Board shall have the right to determine whether multiple sales or exchanges of the voting securities of the Company or multiple Ownership Change Events are related, and its determination shall be final, binding and conclusive.

8.2 Effect of Change in Control on Options. In the event of a Change in Control, the surviving, continuing, successor, or purchasing corporation or other business entity or parent thereof, as the case may be (the ***"Acquiring Corporation"***), may, without the consent of the Optionee, either assume the Company's rights and obligations under outstanding Options or substitute for outstanding Options substantially equivalent options for the Acquiring Corporation's stock. The Board may, in its discretion, provide in any Option Agreement that, in the event of a Change in Control, the exercisability and vesting of the outstanding Option and any shares acquired upon the exercise thereof shall accelerate upon such circumstances and to such extent as specified in such Option Agreement. Any Options which are neither assumed or

substituted for by the Acquiring Corporation in connection with the Change in Control nor exercised as of the date of the Change in Control shall terminate and cease to be outstanding effective as of the date of the Change in Control. Notwithstanding the foregoing, shares acquired upon exercise of an Option prior to the Change in Control and any consideration received pursuant to the Change in Control with respect to such shares shall continue to be subject to all applicable provisions of the Option Agreement evidencing such Option except as otherwise provided in such Option Agreement. Furthermore, notwithstanding the foregoing, if the corporation the stock of which is subject to the outstanding Options immediately prior to an Ownership Change Event described in Section 8.1(a)(i) constituting a Change in Control is the surviving or continuing corporation and immediately after such Ownership Change Event less than fifty percent (50%) of the total combined voting power of its voting stock is held by another corporation or by other corporations that are members of an affiliated group within the meaning of Section 1504(a) of the Code without regard to the provisions of Section 1504(b) of the Code, the outstanding Options shall not terminate unless the Board otherwise provides in its discretion.

9. PROVISION OF INFORMATION.

At least annually, copies of the Company's balance sheet and income statement for the just completed fiscal year shall be made available to each Optionee and purchaser of shares of Stock upon the exercise of an Option. The Company shall not be required to provide such information to key employees whose duties in connection with the Company assure them access to equivalent information. Furthermore, the Company shall deliver to each Optionee such disclosures as are required in accordance with Rule 701 under the Securities Act.

10. COMPLIANCE WITH SECURITIES LAW.

The grant of Options and the issuance of shares of Stock upon exercise of Options shall be subject to compliance with all applicable requirements of federal, state and foreign law with respect to such securities. Options may not be exercised if the issuance of shares of Stock upon exercise would constitute a violation of any applicable federal, state or foreign securities laws or other law or regulations or the requirements of any stock exchange or market system upon which the Stock may then be listed. In addition, no Option may be exercised unless (a) a registration statement under the Securities Act shall at the time of exercise of the Option be in effect with respect to the shares issuable upon exercise of the Option or (b) in the opinion of legal counsel to the Company, the shares issuable upon exercise of the Option may be issued in accordance with the terms of an applicable exemption from the registration requirements of the Securities Act. The inability of the Company to obtain from any regulatory body having jurisdiction the authority, if any, deemed by the Company's legal counsel to be necessary to the lawful issuance and sale of any shares hereunder shall relieve the Company of any liability in respect of the failure to issue or sell such shares as to which such requisite authority shall not have been obtained. As a condition to the exercise of any Option, the Company may require the Optionee to satisfy any qualifications that may be necessary or appropriate, to evidence compliance with any applicable law or regulation and to make any representation or warranty with respect thereto as may be requested by the Company.

11. TERMINATION OR AMENDMENT OF PLAN.

The Board may terminate or amend the Plan at any time. However, subject to changes in applicable law, regulations or rules that would permit otherwise, without the approval of the Company's shareholders, there shall be (a) no increase in the maximum aggregate number of shares of Stock that may be issued under the Plan (except by operation of the provisions of Section 4.2), (b) no change in the class of persons eligible to receive Incentive Stock Options, and (c) no other amendment of the Plan that would require approval of the Company's shareholders under any applicable law, regulation or rule. No termination or amendment of the Plan shall affect any then outstanding Option unless expressly provided by the Board. In any event, no termination or amendment of the Plan may adversely affect any then outstanding Option without the consent of the Optionee, unless such termination or amendment is required to enable an Option designated as an Incentive Stock Option to qualify as an Incentive Stock Option or is necessary to comply with any applicable law, regulation or rule.

12. SHAREHOLDER APPROVAL.

The Plan or any increase in the maximum aggregate number of shares of Stock issuable thereunder as provided in Section 4.1 (the ***"Authorized Shares"***) shall be approved by the shareholders of the Company within twelve (12) months of the date of adoption thereof by the Board. Options granted prior to shareholder approval of the Plan or in excess of the Authorized Shares previously approved by the shareholders shall become exercisable no earlier than the date of shareholder approval of the Plan or such increase in the Authorized Shares, as the case may be.

PLAN HISTORY

December 19, 2001	Board adopts Plan, with an initial reserve of 720,000 shares.
December 19, 2001	Shareholders approve Plan, with an initial reserve of 720,000 shares.
September 24, 2004	Board approves amendment to Plan to increase share reserve to 884,917 shares.
September 24, 2004	Shareholders approve amendment to Plan to increase share reserve to 884,917 shares.
October 20, 2005	Board approves amendment to Plan to increase share reserve to 5,800,331 shares.
October 20, 2005	Shareholders approve amendment to Plan to increase share reserve to 5,800,331 shares.
June 30, 2006	Board approves amendment to Plan to decrease share reserve to 3,591,977 shares.
June 30, 2006	Shareholders approve amendment to Plan to decrease share reserve to 3,591,977 shares.
July 3, 2007	Board approves amendment to Plan to increase share reserve to 4,791,977 shares.
July 11, 2007	Shareholders approve amendment to Plan to increase share reserve to 4,791,977 shares.
October 16, 2007	Board approves amendment to Plan to increase share reserve to 5,991,977 shares.
October 30, 2007	Shareholders approve amendment to Plan to increase share reserve to 5,991,977 shares.
January 10, 2008	Board approves amendment to Plan to decrease share reserve to 5,891,977 shares. (No shareholder approval necessary)
March 19, 2008	Board approves amendment to Plan to increase share reserve to 8,608,207 shares.

March 19, 2008	Shareholders approve amendment to Plan to increase share reserve to 8,608,207 shares.

CELLADON CORPORATION
NOTICE OF GRANT OF STOCK OPTION
(Immediately Exercisable)

_____ (the ***"Optionee"***) has been granted an option (the ***"Option"***) to purchase certain shares of Stock of Celladon Corporation pursuant to the Celladon Corporation **2001 Stock Option Plan** (the ***"Plan"***), as follows:

Date of Option Grant:	_____
Number of Option Shares:	_____
Exercise Price:	$_____ per share
Initial Exercise Date:	_____
Initial Vesting Date:	_____
Option Expiration Date:	The date ten (10) years after the Date of Option Grant
Tax Status of Option:	_____ (Enter "Incentive" or "Nonstatutory." If blank, this Option will be a Nonstatutory Stock Option.)

Vested Shares: Except as provided in the Stock Option Agreement, the number of Vested Shares (disregarding any resulting fractional share) as of any date is determined as follows: One forty-eighth of the Option shall vest each month after the Initial Vesting Date, such that the Option will be fully vested four years after the Initial Vesting Date.

By their signatures below, the Company and the Optionee agree that the Option is governed by this Notice and by the provisions of the Plan and the Stock Option Agreement, both of which are attached to and made a part of this document. The Optionee acknowledges receipt of copies of the Plan and the Stock Option Agreement, represents that the Optionee has read and is familiar with their provisions, and hereby accepts the Option subject to all of their terms and conditions.

CELLADON CORPORATION

By: _____

Its: _____

Address:

OPTIONEE

_____
Signature

_____
Date

_____
Address

_____

ATTACHMENTS: 2001 Stock Option Plan, as amended to the Date of Option Grant; Stock Option Agreement and Exercise Notice

THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAVE NOT BEEN QUALIFIED WITH THE COMMISSIONER OF CORPORATIONS OF THE STATE OF CALIFORNIA AND THE ISSUANCE OF SUCH SECURITIES OR THE PAYMENT OR RECEIPT OF ANY PART OF THE CONSIDERATION THEREFOR PRIOR TO SUCH QUALIFICATION IS UNLAWFUL, UNLESS THE SALE OF SECURITIES IS EXEMPT FROM QUALIFICATION BY SECTION 25100, 25102, OR 25105 OF THE CALIFORNIA CORPORATIONS CODE. THE RIGHTS OF ALL PARTIES TO THIS AGREEMENT ARE EXPRESSLY CONDITIONED UPON SUCH QUALIFICATION BEING OBTAINED, UNLESS THE SALE IS SO EXEMPT.

THE SECURITIES WHICH ARE THE SUBJECT OF THIS AGREEMENT HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO, OR IN CONNECTION WITH, THE SALE OR DISTRIBUTION THEREOF. NO SUCH SALE OR DISPOSITION MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE SECURITIES ACT OF 1933

CELLADON CORPORATION
STOCK OPTION AGREEMENT
(Immediately Exercisable)

Celladon Corporation has granted to the individual (the "***Optionee***") named in the Notice of Grant of Stock Option (the ***"Notice***") to which this Stock Option Agreement (the "***Option Agreement***") is attached an option (the "***Option***") to purchase certain shares of Stock upon the terms and conditions set forth in the Notice and this Option Agreement. The Option has been granted pursuant to and shall in all respects be subject to the terms and conditions of the Celladon Corporation 2001 Stock Option Plan (the "***Plan***"), as amended to the Date of Option Grant, the provisions of which are incorporated herein by reference. By signing the Notice, the Optionee: (a) represents that the Optionee has received copies of, and has read and is familiar with the terms and conditions of, the Notice, the Plan and this Option Agreement, (b) accepts the Option subject to all of the terms and conditions of the Notice, the Plan and this Option Agreement, and (c) agrees to accept as binding, conclusive and final all decisions or interpretations of the Board upon any questions arising under the Notice, the Plan or this Option Agreement.

1. DEFINITIONS AND CONSTRUCTION.

1.1 Definitions. Unless otherwise defined herein, capitalized terms shall have the meanings assigned to such terms in the Notice or the Plan.

1.2 Construction. Captions and titles contained herein are for convenience only and shall not affect the meaning or interpretation of any provision of this Option Agreement. Except when otherwise indicated by the context, the singular shall include the plural and the plural shall include the singular. Use of the term "or" is not intended to be exclusive, unless the context clearly requires otherwise.

2. TAX CONSEQUENCES.

2.1 Tax Status of Option. This Option is intended to have the tax status designated in the Notice.

(a) ***Incentive Stock Option.*** If the Notice so designates, this Option is intended to be an Incentive Stock Option within the meaning of Section 422(b) of the Code, but the Company does not represent or warrant that this Option qualifies as such. The Optionee should consult with the Optionee's own tax advisor regarding the tax effects of this Option and the requirements necessary to obtain favorable income tax treatment under Section 422 of the Code, including, but not limited to, holding period requirements. (NOTE TO OPTIONEE: If the Option is exercised more than three (3) months after the date on which you cease to be an Employee (other than by reason of your death or permanent and total disability as defined in Section 22(e)(3) of the Code), the Option will be treated as a Nonstatutory Stock Option and not as an Incentive Stock Option to the extent required by Section 422 of the Code.)

(b) ***Nonstatutory Stock Option.*** If the Notice so designates, this Option is intended to be a Nonstatutory Stock Option and shall not be treated as an Incentive Stock Option within the meaning of Section 422(b) of the Code.

2.2 ISO Fair Market Value Limitation. *If the Notice designates this Option as an Incentive Stock Option*, then to the extent that the Option (together with all Incentive Stock Options granted to the Optionee under all stock option plans of the Participating Company Group, including the Plan) becomes exercisable for the first time during any calendar year for shares having a Fair Market Value greater than One Hundred Thousand Dollars ($100,000) „ the portion of such options which exceeds such amount will be treated as Nonstatutory Stock Options. For purposes of this Section 2.2, options designated as Incentive Stock Options are taken into account in the order in which they were granted, and the Fair Market Value of stock is determined as of the time the option with respect to such stock is granted. If the Code is amended to provide for a different limitation from that set forth in this Section 2.2, such different limitation shall be deemed incorporated herein effective as of the date required or permitted by such amendment to the Code. If the Option is treated as an Incentive Stock Option in part and as a Nonstatutory Stock Option in part by reason of the limitation set forth in this Section 2.2, the Optionee may designate which portion of such Option the Optionee is exercising. In the absence of such designation, the Optionee shall be deemed to have exercised the Incentive Stock Option portion of the Option first. Separate certificates representing each such portion shall be issued upon the exercise of the Option. (NOTE TO OPTIONEE: If the aggregate Exercise Price of the Option (that is, the Exercise Price multiplied by the Number of Option Shares) plus the aggregate exercise price of any other Incentive Stock Options you hold (whether granted pursuant to the Plan or any other stock option plan of the Participating Company Group) is greater than $100,000, you should contact the Chief Financial Officer of the Company to ascertain whether the entire Option qualifies as an Incentive Stock Option.)

2.3 Election Under Section 83(b) of the Code. If the Optionee exercises this Option to purchase shares of Stock that are both nontransferable and subject to a substantial risk of forfeiture, the Optionee understands that the Optionee should consult with the Optionee's tax advisor regarding the advisability of filing with the Internal Revenue Service an election under

Section 83(b) of the Code, which must be filed no later than thirty (30) days after the date on which the Optionee exercises the Option. Shares acquired upon exercise of the Option are nontransferable and subject to a substantial risk of forfeiture if, for example, (a) they are . unvested and are subject to a right of the Company to repurchase such shares at the Optionee's original purchase price if the Optionee's Service terminates, (b) the Optionee is an Insider and, under certain circumstances, exercises the Option within six (6) months of the Date of Option Grant (if a class of equity security of the Company is registered under Section 12 of the Exchange Act), or (c) the Optionee is subject to a restriction on transfer to comply with "Pooling-of-Interests Accounting" rules. Failure to file an election under Section 83(b), if appropriate, may result in adverse tax consequences to the Optionee. The Optionee acknowledges that the Optionee has been advised to consult with a tax advisor prior to the exercise of the Option regarding the tax consequences to the Optionee of the exercise of the Option. AN ELECTION UNDER SECTION 83(b) MUST BE FILED WITHIN 30 DAYS AFTER THE DATE ON WHICH THE OPTIONEE PURCHASES SHARES. THIS TIME PERIOD CANNOT BE EXTENDED. THE OPTIONEE ACKNOWLEDGES THAT TIMELY FILING OF A SECTION 83(b) ELECTION IS THE OPTIONEE'S SOLE RESPONSIBILITY, EVEN IF THE OPTIONEE REQUESTS THE COMPANY OR ITS REPRESENTATIVE TO FILE SUCH ELECTION ON HIS OR HER BEHALF.

3. ADMINISTRATION.

All questions of interpretation concerning this Option Agreement shall be determined by the Board. All determinations by the Board shall be final and binding upon all persons having an interest in the Option. Any Officer shall have the authority to act on behalf of the Company with respect to any matter, right, obligation, or election which is the responsibility of or which is allocated to the Company herein, provided the Officer has apparent authority with respect to such matter, right, obligation, or election.

4. EXERCISE OF THE OPTION.

4.1 Right to Exercise.

(a) ***In General.*** Except as otherwise provided herein, the Option shall be exercisable on and after the Initial Exercise Date and prior to the termination of the Option (as provided in Section 6) in an amount not to exceed the Number of Option Shares less the number of shares previously acquired upon exercise of the Option, subject to the Company's repurchase rights set forth in Section 11 and Section 12.

(b) ***ISO Exercise Limitation.*** *If this Option is designated as an Incentive Stock Option in the Notice*, then notwithstanding the provisions of Section 4.1(a) and except as provided in Section 4.1(c), the aggregate Fair Market Value of the shares of Stock with respect to which the Optionee may exercise the Option for the first time during any calendar year, when added to the aggregate Fair Market Value of the shares subject to any other options designated as Incentive Stock Options granted to the Optionee under all stock option plans of the Participating Company Group prior to the Date of Option Grant with respect to which such options are exercisable for the first time during the same calendar year, shall not exceed One Hundred Thousand Dollars ($100,000). For purposes of the preceding sentence, options

designated as Incentive Stock Options shall be taken into account in the order in which they were granted, and the Fair Market Value of shares of stock shall be determined as of the time the option with respect to such shares is granted. Such limitation on exercise shall be referred to in this Option Agreement as the "***ISO Exercise Limitation.***" If Section 422 of the Code is amended to provide for a different limitation from that set forth in this Section 4.1(b), the ISO Exercise Limitation shall be deemed amended effective as of the date required or permitted by such amendment to the Code. The ISO Exercise Limitation shall terminate upon the earlier of (i) the Optionee's termination of Service, (ii) the day immediately prior to the effective date of a Change in Control in which the Option is not assumed or substituted for by the Acquiring Corporation as provided in Section 8, or (iii) the day ten (10) days prior to the Option Expiration Date. Upon such termination of the ISO Exercise Limitation, the Option shall be deemed a Nonstatutory Stock Option to the extent of the number of shares subject to the Option which would otherwise exceed the ISO Exercise Limitation.

(c) ***Exception to ISO Exercise Limitation.*** Notwithstanding any other provision of this Option Agreement, if compliance with the ISO Exercise Limitation as set forth in Section 4.1(b) will result in the exercisability of any Vested Shares being delayed more than thirty (30) days beyond the date such shares become Vested Shares (the "***Vesting Date***"), the Option shall be deemed to be two (2) options. The first option shall be for the maximum portion of the Number of Option Shares that can comply with the ISO Exercise Limitation without causing the Option to be unexercisable in the aggregate as to Vested Shares on the Vesting Date for such shares. The second option, which shall not be treated as an Incentive Stock Option as described in section 422(b) of the Code, shall be for the balance of the Number of Option Shares; that is, those such shares which, on the respective Vesting Date for such shares, would be unexercisable if included in the first option and thereby made subject to the ISO Exercise Limitation. Shares treated as subject to the second option shall be exercisable on the same terms and at the same time as set forth in this Option Agreement; provided, however, that (i) Section 4.1(b) shall not apply to the second option and (ii) each such share shall become a Vested Share on the Vesting Date such share must first be allocated to the second option pursuant to the preceding sentence. Unless the Optionee specifically elects to the contrary in the Optionee's written notice of exercise, the first option shall be deemed to be exercised first to the maximum possible extent and then the second option shall be deemed to be exercised.

4.2 Method of Exercise. Exercise of the Option shall be by written notice to the Company which must state the election to exercise the Option, the number of whole shares of Stock for which the Option is being exercised and such other representations and agreements as to the Optionee's investment intent with respect to such shares as may be required pursuant to the provisions of this Option Agreement. The written notice must be signed by the Optionee and must be delivered in person, by certified or registered mail, return receipt requested, by confirmed facsimile transmission, or by such other means as the Company may permit, to the Chief Financial Officer of the Company, or other authorized representative of the Participating Company Group, prior to the termination of the Option as set forth in Section 6, accompanied by (i) full payment of the aggregate Exercise Price for the number of shares of Stock being purchased and (ii) an executed copy, if required herein, of the then current form of escrow agreement referenced below. The Option shall be deemed to be exercised upon receipt by the Company of such written notice, the aggregate Exercise Price, and, if required by the Company, such executed agreement.

4.3 Payment of Exercise Price.

(a) ***Forms of Consideration Authorized.*** Except as otherwise provided below, payment of the aggregate Exercise Price for the number of shares of Stock for which the Option is being exercised shall be made (i) in cash, by check, or cash equivalent, (ii) by tender to the Company, or attestation to the ownership, of whole shares of Stock owned by the Optionee having a Fair Market Value not less than the aggregate Exercise Price, (iii) by means of a Cashless Exercise, as defined in Section 4.3(b), or (iv) by any combination of the foregoing.

(b) ***Limitations on Forms of Consideration.***

(i) Tender of Stock. Notwithstanding the foregoing, the Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock to the extent such tender or attestation would constitute a violation of the provisions of any law, regulation or agreement restricting the redemption of the Company's stock. The Option may not be exercised by tender to the Company, or attestation to the ownership, of shares of Stock unless such shares either have been owned by the Optionee for more than six (6) months (and not used for another option exercise by attestation during such period) or were not acquired, directly or indirectly, from the Company.

(ii) Cashless Exercise. A "***Cashless Exercise***" means the delivery of a properly executed notice together with irrevocable instructions to a broker in a form acceptable to the Company providing for the assignment to the Company of the proceeds of a sale or loan with respect to some or all of the shares of Stock acquired upon the exercise of the Option pursuant to a program or procedure approved by the Company (including, without limitation, through an exercise complying with the provisions of Regulation T as promulgated from time to time by the Board of Governors of the Federal Reserve System). The Company reserves, at any and all times, the right, in the Company's sole and absolute discretion, to decline to approve or terminate any such program or procedure.

4.4 Tax Withholding. At the time the Option is exercised, in whole or in part, or at any time thereafter as requested by the Company, the Optionee hereby authorizes withholding from payroll and any other amounts payable to the Optionee, and otherwise agrees to make adequate provision for (including by means of a Cashless Exercise to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Participating Company Group, if any, which arise in connection. with the Option, including, without limitation, obligations arising upon (i) the exercise, in whole or in part, of the Option, (ii) the transfer, in whole or in part, of any shares acquired upon exercise of the Option, (iii) the operation of any law or regulation providing for the imputation of interest, or (iv) the lapsing of any restriction with respect to any shares acquired upon exercise of the Option. The Option is not exercisable unless the tax withholding obligations of the Participating Company Group are satisfied. Accordingly, the Company shall have no obligation to deliver shares of Stock or to release shares of Stock from an escrow established pursuant to this Option Agreement until the tax withholding obligations of the Participating Company Group have been satisfied by the Optionee.

4.5 Certificate Registration. Except in the event the Exercise Price is paid by means of a Cashless Exercise, the certificate for the shares as to which the Option is exercised shall be registered in the name of the Optionee, or, if applicable, in the names of the heirs of the Optionee.

4.6 Restrictions on Grant of the Option and Issuance of Shares. The grant of the Option and the issuance of shares of Stock upon exercise of the Option shall be subject to compliance with all applicable requirements of federal, state or foreign law with respect to such securities. The Option may not be exercised if the issuance of shares of Stock upon exercise would constitute a violation of any applicable federal, state or foreign securities laws or other law or regulations or the requirements of any stock exchange or market system upon which the Stock may then be listed. In addition, the Option may not be exercised unless (i} a registration statement under the Securities Act shall at the time of exercise of the Option be in effect with respect to the shares issuable upon exercise of the Option or (ii) in the opinion of legal counsel to the Company, the shares issuable upon exercise of the Option may be issued in accordance with the terms of an applicable exemption from the registration requirements of the Securities Act. THE OPTIONEE IS CAUTIONED THAT THE OPTION MAY NOT BE EXERCISED UNLESS THE FOREGOING CONDITIONS ARE SATISFIED. ACCORDINGLY, THE OPTIONEE MAY NOT BE ABLE TO EXERCISE THE OPTION WHEN DESIRED EVEN THOUGH THE OPTION IS VESTED. The inability of the Company to obtain from any regulatory body having jurisdiction the authority, if any, deemed by the Company's legal counsel to be necessary to the lawful issuance and sale of any shares subject to the Option shall relieve the Company of any liability in respect of the failure to issue or sell such shares as to which. such requisite authority shall not have been obtained. As a condition to the exercise of the Option, the Company may require the Optionee to satisfy any qualifications that may be necessary or appropriate, to evidence compliance with any applicable law or regulation and to make any representation or warranty with respect thereto as may be requested by the Company.

4.7 Fractional Shares. The Company shall not be required to issue fractional shares upon the exercise of the Option.

5. NONTRANSFERABILITY OF THE OPTION.

The Option may be exercised during the lifetime of the Optionee only by the Optionee or the Optionee's guardian or legal representative and may not be assigned or transferred in any manner except by will or by the laws of descent and distribution. Following the death of the Optionee, the Option, to the extent provided in Section 7, may be exercised by the Optionee's legal representative or by any person empowered to do so under the deceased Optionee's will or under the then applicable laws of descent and distribution.

6. TERMINATION OF THE OPTION.

The Option shall terminate and may no longer be exercised after the first to occur of (a) the Option Expiration Date, (b) the last date for exercising the Option following termination of the Optionee's Service as described in Section 7, or (c) a Change in Control to the extent provided in Section 8.

7. EFFECT OF TERMINATION OF SERVICE.

7.1 Option Exercisability.

(a) ***Disability.*** If the Optionee's Service terminates because of the Disability of the Optionee, the Option, to the extent unexercised and exercisable on the date on which the Optionee's Service terminated, may be exercised by the Optionee (or the Optionee's guardian or legal representative) at any time prior to the expiration of twelve (12) months after the date on which the Optionee's Service terminated, but in any event no later than the Option Expiration Date.

(b) ***Death.*** If the Optionee's Service terminates because of the death of the Optionee, the Option, to the extent unexercised and exercisable on the date on which the Optionee's Service terminated, may be exercised by the Optionee's legal representative or other person who acquired the right to exercise the Option by reason of the Optionee's death at any time prior to the expiration of twelve (12) months after the date on which the Optionee's Service terminated, but in any event no later than the Option Expiration Date. The Optionee's Service shall be deemed to have terminated on account of death if the Optionee dies within three (3) months after the Optionee's termination of Service.

(c) ***Other Termination of Service.*** If the Optionee's Service terminates for any reason, except Disability or death, the Option, to the extent unexercised and exercisable by the Optionee on the date on which the Optionee's Service terminated, may be exercised by the Optionee at any time prior to the expiration of three (3) months (or such other longer period of time as determined by the Board, in its discretion) after the date on which the Optionee's Service terminated, but in any event no later than the Option Expiration Date.

7.2 Additional Limitations on Option Exercise. Notwithstanding the provisions of Section 7.1, the Option may not be exercised after the Optionee's termination of Service to the extent that the shares to be acquired upon exercise of the Option would be subject to the Unvested Share Repurchase Option as provided in Section 11.

7.3 Extension if Exercise Prevented by Law. Notwithstanding the foregoing, if the exercise of the Option within the applicable time periods set forth in Section 7.1 is prevented by the provisions of Section 4.6, the Option shall remain exercisable until three (3) months after the date the Optionee is notified by the Company that the Option is exercisable, but in any event no later than the Option Expiration Date.

7.4 Extension if Optionee Subject to Section 16(b). Notwithstanding the foregoing, if a sale within the applicable time periods set forth in Section 7.1 of shares acquired upon the exercise of the Option would subject the Optionee to suit under Section 16(b) of the Exchange Act, the Option shall remain exercisable until the earliest to occur of (i) the tenth (10th) day following the date on which a sale of such shares by the Optionee would no longer be subject to such suit, (ii) the one hundred and ninetieth (190th) day after the Optionee's termination of Service, or (iii) the Option Expiration Date.

8. CHANGE IN CONTROL.

8.1 Definitions.

(a) An "***Ownership Change Event***" shall be deemed to have occurred if any of the following occurs with respect to the Company: (i) the direct or indirect sale or exchange in a single or series of related transactions by the shareholders of the Company of more than fifty percent (50%) of the voting stock of the Company; (ii) a merger or consolidation in which the Company is a party; (iii) the sale, exchange, or transfer of all or substantially all of the assets of the Company; or (iv) a liquidation or dissolution of the Company.

(b) A "***Change in Control***" shall mean an Ownership Change Event or a series of related Ownership Change Events (collectively, a "***Transaction***") wherein the shareholders of the Company immediately before the Transaction do not retain immediately after the Transaction, in substantially the same proportions as their ownership of shares of the Company's voting stock immediately before the Transaction, direct or indirect beneficial ownership of more than fifty percent (50%) of the total combined voting power of the outstanding voting securities of the Company or, in the case of a Transaction described in Section 8.1(a)(iii), the corporation or other business entity to which the assets of the Company were transferred (the "***Transferee***"), as the case may be. For purposes of the preceding sentence, indirect beneficial ownership shall include, without limitation, an interest resulting from ownership of the voting securities of one or more corporations or other business entities which own the Company or the Transferee, as the case may be, either directly or through one or more subsidiary corporations or other business entities. The Board shall have the right to determine whether multiple sales or exchanges of the voting securities of the Company or multiple Ownership Change Events are related, and its determination shall be final, binding and conclusive.

8.2 Effect of Change in Control on Option. In the event of a Change in Control, the surviving, continuing, successor, or purchasing corporation or other business entity or parent thereof, as the case may be (the "***Acquiring Corporation***"), may, without the consent of the Optionee, either assume the Company's rights and obligations under the Option or substitute for the Option a substantially equivalent option for the Acquiring Corporation's stock. The Option shall terminate and cease to be outstanding effective as of the date of the Change in Control to the extent that the Option is neither assumed or substituted for by the Acquiring Corporation in connection with the Change in Control nor exercised as of the date of the Change in Control. Notwithstanding the foregoing, shares acquired upon exercise of the Option prior to the Change in Control and any consideration received pursuant to the Change in Control with respect to such shares shall continue to be subject to all applicable provisions of this Option Agreement except as otherwise provided herein. Furthermore, notwithstanding the foregoing, if the corporation the stock of which is subject to the Option immediately prior to an Ownership Change Event described in Section 8.1(a)(i) constituting a Change in Control is the surviving or continuing corporation and immediately after such Ownership Change Event less than fifty percent (50%) of the total combined voting power of its voting stock is held by another corporation or by other corporations that are members of an affiliated group within the meaning of Section 1504(a) of the Code without regard to the provisions of Section 1504(b) of the Code, the Option shall not terminate unless the Board otherwise provides in its discretion.

9. ADJUSTMENTS FOR CHANGES IN CAPITAL STRUCTURE.

In the event of any stock dividend, stock split, reverse stock split, recapitalization, combination, reclassification, or similar change in the capital structure of the Company, appropriate adjustments shall be made in the number, Exercise Price and class of shares of stock subject to the Option. If a majority of the shares which are of the same class as the shares that are subject to the Option are exchanged for, converted into, or otherwise become (whether or not pursuant to an Ownership Change Event) shares of another corporation (the "***New Shares***"), the Board may unilaterally amend the Option to provide that the Option is exercisable for New Shares. In the event of any such amendment, the Number of Option Shares and the Exercise Price shall be adjusted in a fair and equitable manner, as determined by the Board, in its discretion. Notwithstanding the foregoing, any fractional share resulting from an adjustment pursuant to this Section 9 shall be rounded down to the nearest whole number, and in no event may the Exercise Price be decreased to an amount less than the par value, if any, of the stock. subject to the Option. The adjustments determined by the Board pursuant to this Section 9 shall be final, binding and conclusive.

10. RIGHTS AS A SHAREHOLDER, EMPLOYEE OR CONSULTANT.

The Optionee shall have no rights as a shareholder with respect to any shares covered by the Option until the date of the issuance of a certificate for the shares for which the Option has been exercised (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company). No adjustment shall be made for dividends, distributions or other rights for which the record date is prior to the date such certificate is issued, except as provided in Section 9. If the Optionee is an Employee, the Optionee understands and acknowledges that, except as otherwise provided in a separate, written employment agreement between a Participating Company and the Optionee, the Optionee's employment is "at will" and is for no specified term. Nothing in this Option Agreement shall confer upon the Optionee any right to continue in the Service of a Participating Company or interfere in any way with any right of the Participating Company Group to terminate the Optionee's Service as an Employee or Consultant, as the case may be, at any time.

11. UNVESTED SHARE REPURCHASE OPTION.

11.1 Grant of Unvested Share Repurchase Option. In the event the Optionee's Service with the Participating Company Group is terminated for any reason or no reason, with or without cause, or, if the Optionee, the Optionee's legal representative, or other holder of shares acquired upon exercise of the Option attempts to sell, exchange, transfer, pledge, or otherwise dispose of (other than pursuant to an Ownership Change Event) any Unvested Shares, as defined in Section 11.2 below (the "***Unvested Shares***"), the Company shall have the right to repurchase the Unvested Shares under the terms and subject to the conditions set forth in this Section 11 (the "***Unvested Share Repurchase Option***").

11.2 Unvested Shares Defined. The "***Unvested Shares***" shall mean, on any given date, the number of shares of Stock acquired upon exercise of the Option which exceed the Vested Shares determined as of such date.

11.3 Exercise of Unvested Share Repurchase Option. The Company may exercise the Unvested Share Repurchase Option by written notice to the Optionee within sixty (60) days after (a) termination of the Optionee's Service (or exercise of the Option, if later) or (b) the Company has received notice of the attempted disposition of Unvested Shares. If the Company fails to give notice within such sixty (60) day period, the Unvested Share Repurchase Option shall terminate unless the Company and the Optionee have extended the time for the exercise of the Unvested Share Repurchase Option. The Unvested Share Repurchase Option must be exercised, if at all, for all of the Unvested Shares, except as the Company and the Optionee otherwise agree.

11.4 Payment for Shares and Return of Shares to Company. The purchase price per share being repurchased by the Company shall be an amount equal to the Optionee's original cost per share, as adjusted pursuant to Section 9 (the "***Repurchase Price***"). The Company shall pay the aggregate Repurchase Price to the Optionee in cash within thirty (30) days after the date of the written notice to the Optionee of the Company's exercise of the Unvested Share Repurchase Option. For purposes of the foregoing, cancellation of any purchase money indebtedness of the Optionee to any Participating Company for the shares shall be treated as payment to the Optionee in cash to the extent of the unpaid principal and any accrued interest canceled. The shares being repurchased shall be delivered to the Company by the Optionee at the same time as the delivery of the Repurchase Price to the Optionee.

11.5 Assignment of Unvested Share Repurchase Option. The Company shall have the right to assign the Unvested Share Repurchase Option at any time, whether or not such option is then exercisable, to one or more persons as may be selected by the Company.

11.6 Ownership Change Event. Upon the occurrence of an Ownership Change Event, any and all new, substituted or additional securities or other property to which the Optionee is entitled by reason of the Optionee's ownership of Unvested Shares shall be immediately subject to the Unvested Share Repurchase Option and included in the terms "Stock" and "Unvested Shares" for all purposes of the Unvested Share Repurchase Option with the same force and effect as the Unvested Shares immediately prior to the Ownership Change Event. While the aggregate Repurchase Price shall remain the same after such Ownership Change Event, the Repurchase Price per Unvested Share upon exercise of the Unvested Share Repurchase Option following such Ownership Change Event shall be adjusted as appropriate. For purposes of determining the Vested Shares following an Ownership Change Event, credited Service shall include all Service with any corporation which is a Participating Company at the time the Service is rendered, whether or not such corporation is a Participating Company both before and after the Ownership Change Event.

12. RIGHT OF FIRST REFUSAL.

12.1 Grant of Right of First Refusal Except as provided in Section 12.7 below, in the event the Optionee, the Optionee's legal representative, or other holder of shares acquired upon exercise of the Option proposes to sell, exchange, transfer, pledge, or otherwise dispose of any Vested Shares (the "***Transfer Shares***") to any person or entity, including, without limitation, any shareholder of a Participating Company, the Company shall have the right to

repurchase the Transfer Shares under the terms and subject to the conditions set forth in this Section 12 (the "***Right of First Refusal***").

12.2 Notice of Proposed Transfer. Prior to any proposed transfer of the Transfer Shares, the Optionee shall deliver written notice (the "***Transfer Notice***") to the Company describing fully the proposed transfer, including the number of Transfer Shares, the name and address of the proposed transferee (the "***Proposed Transferee***") and, if the transfer is voluntary, the proposed transfer price, and containing such information necessary to show the bona fide nature of the proposed transfer. In the event of a bona fide gift or involuntary transfer, the proposed transfer price shall be deemed to be the Fair Market Value of the Transfer Shares, as determined by the Board in good faith. If the Optionee proposes to transfer any Transfer Shares to more than one Proposed Transferee, the Optionee shall provide a separate Transfer Notice for the proposed transfer to each Proposed Transferee. The Transfer Notice shall be signed by both the Optionee and the Proposed Transferee and must constitute a binding commitment of the Optionee and the Proposed Transferee for the transfer of the Transfer Shares to the Proposed Transferee subject only to the Right of First Refusal.

12.3 Bona Fide Transfer. If the Company determines that the information provided by the Optionee in the Transfer Notice is insufficient to establish the bona fide nature of a proposed voluntary transfer, the Company shall give the Optionee written notice of the Optionee's failure to comply with the procedure described in this Section 12, and the Optionee shall have no right to transfer the Transfer Shares without first complying with the procedure described in this Section 12. The Optionee shall not be permitted to transfer the Transfer Shares if the proposed transfer is not bona fide.

12.4 Exercise of Right of First Refusal. If the Company determines the proposed transfer to be bona fide, the Company shall have the right to purchase all, but not less than all, of the Transfer Shares (except as the Company and the Optionee otherwise agree) at the purchase price and on the terms set forth in the Transfer Notice by delivery to the Optionee of a notice of exercise of the Right of First Refusal within thirty (30) days after the date the Transfer Notice is delivered to the Company. The Company's exercise or failure to exercise the Right of First Refusal with respect to any proposed transfer described in a Transfer Notice shall not affect the Company's right to exercise the Right of First Refusal with respect to any proposed transfer described in any other Transfer Notice, whether or not such other Transfer Notice is issued by the Optionee or issued by a person other than the Optionee with respect to a proposed transfer to the same Proposed Transferee. If the Company exercises the Right of First Refusal, the Company and the Optionee shall thereupon consummate the sale of the Transfer Shares to the Company on the terms set forth in the Transfer Notice within sixty (60) days after the date the Transfer Notice is delivered to the Company (unless a longer period is offered by the Proposed Transferee); provided, however, that in the event the Transfer Notice provides for the payment for the Transfer Shares other than in cash, the Company shall have the option of paying for the Transfer Shares by the present value cash equivalent of the consideration described in the Transfer Notice as reasonably determined by the Company. For purposes of the foregoing, cancellation of any indebtedness of the Optionee to any Participating Company shall be treated as payment to the Optionee in cash to the extent of the unpaid principal and any accrued interest canceled.

12.5 Failure to Exercise Right of First Refusal. If the Company fails to exercise the Right of First Refusal in full (or to such lesser extent as the Company and the Optionee otherwise agree) within the period specified in Section 12.4 above, the Optionee may conclude a transfer to the Proposed Transferee of the Transfer Shares on the terms and conditions described in the Transfer Notice, provided such transfer occurs not later than ninety (90) days following delivery to the Company of the Transfer Notice. The Company shall have the right to demand further assurances from the Optionee and the Proposed Transferee (in a form satisfactory to the Company) that the transfer of the Transfer Shares was actually carried out on the terms and conditions described in the Transfer Notice. No Transfer Shares shall be transferred on the books of the Company until the Company has received such assurances, if so demanded, and has approved the proposed transfer as bona fide. Any proposed transfer on terms and conditions different from those described in the Transfer Notice, as well as any subsequent proposed transfer by the Optionee, shall again be subject to the Right of First Refusal and shall require compliance by the Optionee with the procedure described in this Section 12.

12.6 Transferees of Transfer Shares. All transferees of the Transfer Shares or any interest therein, other than the Company, shall be required as a condition of such transfer to agree in writing (in a form satisfactory to the Company) that such transferee shall receive and hold such Transfer Shares or interest therein subject to all of the terms and conditions of this Option Agreement, including this Section 12 providing for the Right of First Refusal with respect to any subsequent transfer. Any sale or transfer of any shares acquired upon exercise of the Option shall be void unless the provisions of this Section 12 are met.

12.7 Transfers Not Subject to Right of First Refusal. The Right of First Refusal shall not apply to any transfer or exchange of the shares acquired upon exercise of the Option if such transfer or exchange is in connection with an Ownership Change Event. If the consideration received pursuant to such transfer or exchange consists of stock of a Participating Company, such consideration shall remain subject to the Right of First Refusal unless the provisions of Section 12.9 below result in a termination of the Right of First Refusal.

12.8 Assignment of Right of First Refusal. The Company shall have the right to assign the Right of First Refusal at any time, whether or not there has been an attempted transfer, to one or more persons as may be selected by the Company.

12.9 Early Termination of Right of First Refusal. The other provisions of this Option Agreement notwithstanding, the Right of First Refusal shall terminate and be of no further force and effect upon (a) the occurrence of a Change in Control, unless the Acquiring Corporation assumes the Company's rights and obligations under the Option or substitutes a substantially equivalent option for the Acquiring Corporation's stock for the Option, or (b) the existence of a public market for the class of shares subject to the Right of First Refusal. A "***public market***" shall be deemed to exist if (i) such stock is listed on a national securities exchange (as that term is used in the Exchange Act) or (ii) such stock is traded on the over-the-counter market and prices therefor are published daily on business days in a recognized financial journal.

13. ESCROW.

13.1 Establishment of Escrow. To ensure that shares subject to the Unvested Share Repurchase Option will be available for repurchase, the Company may require the Optionee to deposit the certificate evidencing the shares which the Optionee purchases upon exercise of the Option with an agent designated by the Company under the terms and conditions of an escrow agreement approved by the Company. If the Company does not require such deposit as a condition of exercise of the Option, the Company reserves the right at any time to require the Optionee to so deposit the certificate in escrow. Upon the occurrence of an Ownership Change Event or a change, as described in Section 9, in the character or amount: of any of the outstanding stock of the corporation the stock of which is subject to the provisions of this Option Agreement, any and all new, substituted or additional securities or other property to which the Optionee is entitled by reason of the Optionee's ownership of shares of Stock acquired upon exercise of the Option that remain, following such Ownership Change Event or change described in Section 9, subject to the Unvested Share Repurchase Option shall be immediately subject to the escrow to the same extent as such shares of Stock immediately before such event. The Company shall bear the expenses of the escrow.

13.2 Delivery of Shares to Optionee. As soon as practicable after the expiration of the Unvested Share Repurchase Option, but not more frequently than twice each calendar year, the escrow agent shall deliver to the Optionee the shares and any other property no longer subject to such restriction.

13.3 Notices and Payments. In the event the shares and any other property held in escrow are subject to the Company's exercise of the Unvested Share Repurchase Option or the Right of First Refusal, the notices required to be given to the Optionee shall be given to the escrow agent, and any payment required to be given to the Optionee shall be given to the escrow agent. Within thirty (30) days after payment by the Company, the escrow agent shall deliver the shares and any other property which the Company has purchased to the Company and shall deliver the payment received from the Company to the Optionee.

14. STOCK DISTRIBUTIONS SUBJECT TO OPTION AGREEMENT.

If, from time to time, there is any stock dividend, stock split or other change, as described in Section 9, in the character or amount of any of the outstanding stock of the corporation the stock of which is subject to the provisions of this Option Agreement, then in such event any and all new, substituted or additional securities to which the Optionee is entitled by reason of the Optionee's ownership of the shares acquired upon exercise of the Option shall be immediately subject to the Unvested Share Repurchase Option and the Right of First Refusal with the same force and effect as the shares subject to the Unvested Share Repurchase Option and the Right of First Refusal immediately before such event.

15. NOTICE OF SALES UPON DISQUALIFYING DISPOSITION.

The Optionee shall dispose of the shares acquired pursuant to the Option only in accordance with the provisions of this Option Agreement. In addition, *if the Notice designates this Option as an Incentive Stock Option*, the Optionee shall (a) promptly notify the Chief

Financial Officer of the Company if the Optionee disposes of any of the shares acquired pursuant to the Option within one (1) year after the date the Optionee exercises all or part of the Option or within two (2) years after the Date of Option Grant and (b) provide the Company with a description of the circumstances of such disposition. Until such time as the Optionee disposes of such shares in a manner consistent with the provisions of this Option Agreement, unless otherwise expressly authorized by the Company, the Optionee shall hold all shares acquired pursuant to the Option in the Optionee's name (and not in the name of any nominee) for the one-year period immediately after the exercise of the Option and the two-year period immediately after Date of Option Grant. At any time during the one-year or two-year periods set forth above, the Company may place a legend on any certificate representing shares acquired pursuant to the Option requesting the transfer agent for the Company's stock to notify the Company of any such transfers. The obligation of the Optionee to notify the Company of any such transfer shall continue notwithstanding that a legend has been placed on the certificate pursuant to the preceding sentence.

16. LEGENDS.

The Company may at any time place legends referencing the Unvested Share Repurchase Option, the Right of First Refusal, and any applicable federal, state or foreign securities law restrictions on all certificates representing shares of stock subject to the provisions of this Option Agreement. The Optionee shall, at the request of the Company, promptly present to the Company any and all certificates representing shares acquired pursuant to the Option in the possession of the Optionee in order to carry out the provisions of this Section. Unless otherwise specified by the Company, legends placed on such certificates may include, but shall not be limited to, the following:

16.1 "THE SECURITIES EVIDENCED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, AND MAY NOT BE SOLD, TRANSFERRED, ASSIGNED OR HYPOTHECATED UNLESS THERE IS AN EFFECTIVE REGISTRATION STATEMENT UNDER SUCH ACT COVERING SUCH SECURITIES, THE SALE IS MADE IN ACCORDANCE WITH RULE 144 OR RULE 701 UNDER THE ACT, OR THE COMPANY RECEIVES AN OPINION OF COUNSEL REASONABLY SATISFACTORY TO THE COMPANY, STATING THAT SUCH SALE, TRANSFER, ASSIGNMENT OR HYPOTHECATION IS EXEMPT FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SUCH ACT."

16.2 "THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO AN UNVESTED SHARE REPURCHASE OPTION IN FAVOR OF THE CORPORATION OR ITS ASSIGNEE SET FORTH IN AN AGREEMENT BETWEEN THE CORPORATION AND THE REGISTERED HOLDER, OR SUCH HOLDER'S PREDECESSOR IN INTEREST, A COPY OF WHICH IS ON FILE AT THE PRINCIPAL OFFICE OF THIS CORPORATION."

16.3 "THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A RIGHT OF FIRST REFUSAL OPTION IN FAVOR OF THE CORPORATION OR ITS ASSIGNEE SET FORTH IN AN AGREEMENT BETWEEN THE CORPORATION AND THE REGISTERED HOLDER, OR SUCH HOLDER'S

PREDECESSOR IN INTEREST, A COPY OF WHICH IS ON FILE AT THE PRINCIPAL OFFICE OF THIS CORPORATION."

16.4 "THE SHARES EVIDENCED BY THIS CERTIFICATE WERE ISSUED BY THE CORPORATION TO THE REGISTERED HOLDER UPON EXERCISE OF AN INCENTIVE STOCK OPTION AS DEFINED IN SECTION 422 OF THE INTERNAL REVENUE CODE OF 1986, AS AMENDED ("ISO"). IN ORDER TO OBTAIN THE PREFERENTIAL TAX TREATMENT AFFORDED TO ISOs, THE SHARES SHOULD NOT BE TRANSFERRED PRIOR TO *[INSERT DISQUALIFYING DISPOSITION DATE HERE*]. SHOULD THE REGISTERED HOLDER ELECT TO TRANSFER ANY OF THE SHARES PRIOR TO THIS DATE AND FOREGO ISO TAX TREATMENT, THE TRANSFER AGENT FOR THE SHARES SHALL NOTIFY THE CORPORATION IMMEDIATELY. THE REGISTERED HOLDER SHALL HOLD ALL SHARES PURCHASED UNDER THE INCENTIVE STOCK OPTION IN THE REGISTERED HOLDER'S NAME (AND NOT IN THE NAME OF ANY NOMINEE) PRIOR TO THIS DATE OR UNTIL TRANSFERRED AS DESCRIBED ABOVE."

17. LOCK-UP AGREEMENT.

The Optionee hereby agrees that in the event of any underwritten public offering of stock, including an initial public offering of stock, made by the Company pursuant to an effective registration statement filed under the Securities Act, the Optionee shall not offer, sell, contract to sell, pledge, hypothecate, grant any option to purchase or make any short sale of, or otherwise dispose of any shares of stock of the Company or any rights to acquire stock of the Company for such period of time from and after the effective date of such registration statement as may be established by the underwriter for such public offering; provided, however, that such period of time shall not exceed one hundred eighty (180) days from the effective date of the registration statement to be filed in connection with such public offering. The foregoing limitation shall not apply to shares registered in the public offering under the Securities Act.

18. RESTRICTIONS ON TRANSFER OF SHARES.

No shares acquired upon exercise of the Option may be sold, exchanged, transferred (including, without limitation, any transfer to a nominee or agent of the Optionee), assigned, pledged, hypothecated or otherwise disposed of, including by operation of law, in any manner which violates any of the provisions of this Option Agreement and, except pursuant to an Ownership Change Event, until the date on which such shares become Vested Shares, and any such attempted disposition shall be void. The Company shall not be required (a) to transfer on its books any shares which will have been transferred in violation of any of the provisions set forth in this Option Agreement or (b) to treat as owner of such shares or to accord the right to vote as such owner or to pay dividends to any transferee to whom such shares will have been so transferred.

19. MISCELLANEOUS PROVISIONS.

19.1 Binding Effect. Subject to the restrictions on transfer set forth herein, this Option Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns.

19.2 Termination or Amendment. The Board may terminate or amend the Plan or the Option at any time; provided, however, that except as provided in Section 8.2 in connection with a Change in Control, no such termination or amendment may adversely affect the Option or any unexercised portion hereof without the consent of the Optionee unless such termination or amendment is necessary to comply with any applicable law or government regulation or is required to enable the Option, if designated an Incentive Stock Option in the Notice, to qualify as an Incentive Stock Option. No amendment or addition to this Option Agreement shall be effective unless in writing.

19.3 Notices. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given (except to the extent that this Option Agreement provides for effectiveness only upon actual receipt of such notice) upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail, with postage and fees prepaid, addressed to the other party at the address shown below that party's signature or at such other address as such party may designate in writing from time to time to the other party.

19.4 Integrated Agreement. The Notice, this Option Agreement and the Plan constitute the entire understanding and agreement of the Optionee and the Participating Company Group with respect to the subject matter contained herein or therein and supersedes any prior agreements, understandings, restrictions, representations, or warranties among the Optionee and the Participating Company Group with respect to such subject matter other than those as set forth or provided for herein or therein. To the extent contemplated herein or therein, the provisions of the Notice and the Option Agreement shall survive any exercise of the Option and shall remain in full force and effect.

19.5 Applicable Law. This Option Agreement shall be governed by the laws of the State of California as such laws are applied to agreements between California residents entered into and to be performed entirely within the State of California.

19.6 Counterparts. The Notice may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

☐ Incentive Stock Option
☐ Nonstatutory Stock Option

Optionee: _____

Date: _____

STOCK OPTION EXERCISE NOTICE
(IMMEDIATELY EXERCISABLE)

Celladon Corporation
Attention: Chief Financial Officer

_____

_____

Ladies and Gentlemen:

1. Option. I was granted an option (the "***Option***") to purchase shares of the common stock (the "***Shares***") of Celladon Corporation (the "***Company***") pursuant to the Company's 2001 Stock Option Plan (the "***Plan***"), my Notice of Grant of Stock Option (the "***Notice***") and my Stock Option Agreement (the "***Option Agreement***") as follows:

Grant Number: _____

Date of Option Grant: _____

Number of Option Shares: _____

Exercise Price per Share: $ _____

2. Exercise of Option. I hereby elect to exercise the Option to purchase the following number of Shares:

Vested Shares: _____

Unvested Shares: _____

Total Shares Purchased: _____

Total Exercise Price (Total Shares X Price per Share) $ _____

3. Payments. I enclose payment in full of the total exercise price for the Shares in the following form(s), as authorized by my Option Agreement:

☐ Cash: $ _____

☐ Check: $ _____

☐ Tender of Company Stock: Contact Plan Administrator

4. Tax Withholding. I authorize payroll withholding and otherwise will make adequate provision for the federal, state, local and foreign tax withholding obligations of the Company, if any, in connection with the Option. If I am exercising a Nonstatutory Stock Option, I enclose payment in full of my withholding taxes, if any, as follows:

(Contact Plan Administrator for amount of tax due.)

☐ Cash: $ _____

☐ Check: $ _____

5. Optionee Information.

My address is: _____

_____

_____

_____

My Social Security Number is: _____

_____

6. Notice of Disqualifying Disposition. If the Option is an Incentive Stock Option, I agree that I will promptly notify the Chief Financial Officer of the Company if I transfer any of the Shares within one (1) year from the date I exercise all or part of the Option or within two (2) years of the Date of Option Grant.

7. Binding Effect. I agree that the Shares are being acquired in accordance with and subject to the terms, provisions and conditions of the Option Agreement, including the Unvested Share Repurchase Option and the Right of First Refusal set forth therein, to all of which I hereby expressly assent. This Agreement shall inure to the benefit of and be binding upon my heirs, executors, administrators, successors and assigns. If required by the Company, I agree to deposit the certificate(s) evidencing the Shares, along with a blank stock assignment separate from certificate executed by me, with an escrow agent designated by the Company, to be held pursuant to the Company's standard Joint Escrow Instructions.

8. Transfer. I understand and acknowledge that the Shares have not been registered under the Securities Act of 1933, as amended (the "***Securities Act***"), and that consequently the Shares must be held indefinitely unless they are subsequently registered under the Securities Act, an exemption from such registration is available, or they are sold in accordance with Rule 144 or Rule 701 under the Securities Act. I further understand and acknowledge that the Company is under no obligation to register the Shares. I understand that the certificate or certificates evidencing the Shares will be imprinted with legends which prohibit the transfer of the Shares unless they are registered or such registration is not required in the opinion of legal counsel satisfactory to the Company.

I am aware that Rule 144 under the Securities Act, which permits limited public resale of securities acquired in a nonpublic offering, is not currently available with respect to the Shares and, in any event, is available only if certain conditions are satisfied. I understand that any sale of

the Shares that might be made in reliance upon Rule 144 may only be made in limited amounts in accordance with the terms and conditions of such rule and that a copy of Rule 144 will be delivered to me upon request.

9. Election Under Section 83(b) of the Code. I understand and acknowledge that if I am exercising the Option to purchase Unvested Shares (i.e., shares that remain subject to the Company's Unvested Share Repurchase Option), that I should consult with my tax advisor regarding the advisability of filing with the Internal Revenue Service an election under Section 83(b) of the Code, which must be filed no later than thirty (30) days after the date on which I exercise the Option. I acknowledge that I have been advised to consult with a tax advisor prior to the exercise of the Option regarding the tax consequences to me of exercising the Option. AN ELECTION UNDER SECTION 83(b) MUST BE FILED WITHIN 30 DAYS AFTER THE DATE ON WHICH I PURCHASE SHARES. THIS TIME PERIOD CANNOT BE EXTENDED. I ACKNOWLEDGE THAT TIMELY FILING OF A SECTION 83(b) ELECTION IS MY SOLE RESPONSIBILITY, EVEN IF I REQUEST THE COMPANY OR ITS REPRESENTATIVES TO FILE SUCH ELECTION ON MY BEHALF.

I understand that I am purchasing the Shares pursuant to the terms of the Plan, the Notice and my Option Agreement, copies of which I have received and carefully read and understand.

Very truly yours,

_____

(Signature)

Receipt of the above is hereby acknowledged.

CELLADON CORPORATION

By: _____

Title: _____

Dated: _____

CELLADON CORPORATION

2012 EQUITY INCENTIVE PLAN

ADOPTED BY THE BOARD OF DIRECTORS: JANUARY 26, 2012
APPROVED BY THE SHAREHOLDERS: JANUARY 26, 2012
AMENDED BY THE BOARD OF DIRECTORS: APRIL 27, 2012
APPROVED BY THE STOCKHOLDERS: APRIL 27, 2012
TERMINATION DATE: JANUARY 25, 2022

1. GENERAL.

(a) Eligible Stock Award Recipients. Employees, Directors and Consultants are eligible to receive Stock Awards.

(b) Available Stock Awards. The Plan provides for the grant of the following types of Stock Awards: (i) Incentive Stock Options, (ii) Nonstatutory Stock Options, (iii) Stock Appreciation Rights, (iv) Restricted Stock Awards, (v) Restricted Stock Unit Awards and (vi) Other Stock Awards.

(c) Purpose. The Plan, through the granting of Stock Awards, is intended to help the Company secure and retain the services of eligible award recipients, provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate and provide a means by which the eligible recipients may benefit from increases in value of the Common Stock.

2. ADMINISTRATION.

(a) Administration by Board. The Board will administer the Plan. The Board may delegate administration of the Plan to a Committee or Committees, as provided in Section 2(c).

(b) Powers of Board. The Board will have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine (A) who will be granted Stock Awards; (B) when and how each Stock Award will be granted; (C) what type of Stock Award will be granted; (D) the provisions of each Stock Award (which need not be identical), including when a person will be permitted to exercise or otherwise receive cash or Common Stock under the Stock Award; (E) the number of shares of Common Stock subject to a Stock Award; and (F) the Fair Market Value applicable to a Stock Award.

(ii) To construe and interpret the Plan and Stock Awards granted under it, and to establish, amend and revoke rules and regulations for administration of the Plan and Stock Awards. The Board, in the exercise of these powers, may correct any defect, omission or inconsistency in the Plan or in any Stock Award Agreement, in a manner and to the extent it will deem necessary or expedient to make the Plan or Stock Award fully effective.

(iii) To settle all controversies regarding the Plan and Stock Awards granted under it.

(iv) To accelerate, in whole or in part, the time at which a Stock Award may be exercised or vest (or at which cash or shares of Common Stock may be issued).

(v) To suspend or terminate the Plan at any time. Except as otherwise provided in the Plan or a Stock Award Agreement, suspension or termination of the Plan will not impair a Participant's rights under his or her then-outstanding Stock Award without his or her written consent except as provided in subsection (viii) below.

(vi) To amend the Plan in any respect the Board deems necessary or advisable, including, without limitation, by adopting amendments relating to Incentive Stock Options and certain nonqualified deferred compensation under Section 409A of the Code and/or to make the Plan or Stock Awards granted under the Plan exempt from or compliant with the requirements for Incentive Stock Options or nonqualified deferred compensation under Section 409A of the Code, subject to the limitations, if any, of applicable law. However, if required by applicable law, and except as provided in Section 9(a) relating to Capitalization Adjustments, the Company will seek stockholder approval of any amendment of the Plan that (A) materially increases the number of shares of Common Stock available for issuance under the Plan, (B) materially expands the class of individuals eligible to receive Stock Awards under the Plan, (C) materially increases the benefits accruing to Participants under the Plan, (D) materially reduces the price at which shares of Common Stock may be issued or purchased under the Plan, (E) materially extends the term of the Plan, or (F) materially expands the types of Stock Awards available for issuance under the Plan. Except as provided in the Plan (including subsection (viii) below) or a Stock Award Agreement, no amendment of the Plan will impair a Participant's rights under an outstanding Stock Award unless (1) the Company requests the consent of the affected Participant, and (2) such Participant consents in writing.

(vii) To submit any amendment to the Plan for stockholder approval, including, but not limited to, amendments to the Plan intended to satisfy the requirements of Section 422 of the Code regarding Incentive Stock Options.

(viii) To approve forms of Stock Award Agreements for use under the Plan and to amend the terms of any one or more Stock Awards, including, but not limited to, amendments to provide terms more favorable to the Participant than previously provided in the Stock Award Agreement, subject to any specified limits in the Plan that are not subject to Board discretion; *provided however,* that a Participant's rights under any Stock Award will not be impaired by any such amendment unless (A) the Company requests the consent of the affected Participant, and (B) such Participant consents in writing. Notwithstanding the foregoing, (1) a Participant's rights will not be deemed to have been impaired by any such amendment if the Board, in its sole discretion, determines that the amendment, taken as a whole, does not materially impair the Participant's rights, and (2) subject to the limitations of applicable law, if any, the Board may amend the terms of any one or more Stock Awards without the affected Participant's consent (A) to maintain the qualified status of the Stock Award as an Incentive Stock Option under Section 422 of the Code; (B) to change the terms of an Incentive Stock Option, if such change results in impairment of the Award solely because it impairs the qualified status of the Award as

an Incentive Stock Option under Section 422 of the Code; (C) to clarify the manner of exemption from, or to bring the Stock Award into compliance with, Section 409A of the Code; or (D) to comply with other applicable laws.

(ix) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company and that are not in conflict with the provisions of the Plan or Stock Awards.

(x) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees, Directors or Consultants who are foreign nationals or employed outside the United States (provided that Board approval will not be necessary for immaterial modifications to the Plan or any Stock Award Agreement that are required for compliance with the laws of the relevant foreign jurisdiction).

(xi) To effect, with the consent of any adversely affected Participant, (A) the reduction of the exercise, purchase or strike price of any outstanding Stock Award; (B) the cancellation of any outstanding Stock Award and the grant in substitution therefor of a new (1) Option or SAR, (2) Restricted Stock Award, (3) Restricted Stock Unit Award, (4) Other Stock Award, (5) cash and/or (6) other valuable consideration determined by the Board, in its sole discretion, with any such substituted award (x) covering the same or a different number of shares of Common Stock as the cancelled Stock Award and (y) granted under the Plan or another equity or compensatory plan of the Company; or (C) any other action that is treated as a repricing under generally accepted accounting principles.

(c) Delegation to Committee. The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration of the Plan is delegated to a Committee, the Committee will have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee of the Committee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board will thereafter be to the Committee or subcommittee). Any delegation of administrative powers will be reflected in resolutions, not inconsistent with the provisions of the Plan, adopted from time to time by the Board or Committee (as applicable). The Committee may, at any time, abolish the subcommittee and/or revest in the Committee any powers delegated to the subcommittee. The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, revest in the Board some or all of the powers previously delegated.

(d) Delegation to an Officer. The Board may delegate to one (1) or more Officers the authority to do one or both of the following (i) designate Employees who are not Officers to be recipients of Options and SARs (and, to the extent permitted by applicable law, other Stock Awards) and, to the extent permitted by applicable law, the terms of such rights and options, and (ii) determine the number of shares of Common Stock to be subject to such Stock Awards granted to such Employees; provided, however, that the Board resolutions regarding such delegation will specify the total number of shares of Common Stock that may be subject to the Stock Awards granted by such Officer and that such Officer may not grant a Stock Award to himself or herself. Any such Stock Awards will be granted on the form of Stock Award Agreement most recently approved for use by the Committee or the Board, unless otherwise

provided in the resolutions approving the delegation authority. The Board may not delegate authority to an Officer who is acting solely in the capacity of an Officer (and not also as a Director) to determine the Fair Market Value pursuant to Section 13(t) below.

(e) Effect of Board's Decision. All determinations, interpretations and constructions made by the Board in good faith will not be subject to review by any person and will be final, binding and conclusive on all persons.

3. SHARES SUBJECT TO THE PLAN.

(a) Share Reserve.

(i) Subject to Section 9(a) relating to Capitalization Adjustments, the aggregate number of shares of Common Stock that may be issued pursuant to Stock Awards from and after the Effective Date will not exceed 3,747,920 shares (the "***Share Reserve***"). In addition, the number of shares of Common Stock available for issuance under the Plan shall automatically increase immediately following each of the Second Additional Closing, First Milestone Closing and Second Milestone Closing (each as defined in the Amended and Restated Series A-1 and Junior Preferred Stock Purchase Agreement dated as of April 27, 2012 by and among the Company and the persons and entities listed on the Schedule of Purchasers attached thereto (as may be amended from time to time, the "***Purchase Agreement***")), to an amount equal to eleven percent (11%) of the fully-diluted capitalization of the Company immediately following such Closing.

(ii) For clarity, the Share Reserve in this Section 3(a) is a limitation on the number of shares of Common Stock that may be issued pursuant to the Plan. Accordingly, this Section 3(a) does not limit the granting of Stock Awards except as provided in Section 7(a).

(b) Reversion of Shares to the Share Reserve. If a Stock Award or any portion thereof (i) expires or otherwise terminates without all of the shares covered by such Stock Award having been issued or (ii) is settled in cash (*i.e.*, the Participant receives cash rather than stock), such expiration, termination or settlement will not reduce (or otherwise offset) the number of shares of Common Stock that may be available for issuance under the Plan. If any shares of Common Stock issued pursuant to a Stock Award are forfeited back to or repurchased by the Company because of the failure to meet a contingency or condition required to vest such shares in the Participant, then the shares that are forfeited or repurchased will revert to and again become available for issuance under the Plan. Any shares reacquired by the Company in satisfaction of tax withholding obligations on a Stock Award or as consideration for the exercise or purchase price of a Stock Award will again become available for issuance under the Plan.

(c) Incentive Stock Option Limit. Subject to the Share Reserve and Section 9(a) relating to Capitalization Adjustments, the aggregate maximum number of shares of Common Stock that may be issued pursuant to the exercise of Incentive Stock Options will be 20,000,000 shares of Common Stock.

(d) Source of Shares. The stock issuable under the Plan will be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the open market or otherwise.

4. ELIGIBILITY.

(a) Eligibility for Specific Stock Awards. Incentive Stock Options may be granted only to employees of the Company or a "parent corporation" or "subsidiary corporation" thereof (as such terms are defined in Sections 424(e) and 424(f) of the Code). Stock Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants; *provided*, *however*, that Stock Awards may not be granted to Employees, Directors and Consultants who are providing Continuous Service only to any "parent" of the Company, as such term is defined in Rule 405, unless (i) the stock underlying such Stock Awards is treated as "service recipient stock" under Section 409A of the Code (for example, because the Stock Awards are granted pursuant to a corporate transaction such as a spin off transaction), or (ii) the Company, in consultation with its legal counsel, has determined that such Stock Awards are otherwise exempt from or alternatively comply with the distribution requirements of Section 409A of the Code.

(b) Ten Percent Stockholders. A Ten Percent Stockholder will not be granted an Incentive Stock Option unless the exercise price of such Option is at least one hundred ten percent (110%) of the Fair Market Value on the date of grant and the Option is not exercisable after the expiration of five (5) years from the date of grant.

(c) Consultants. A Consultant will not be eligible for the grant of a Stock Award if, at the time of grant, either the offer or sale of the Company's securities to such Consultant is not exempt under Rule 701 because of the nature of the services that the Consultant is providing to the Company, because the Consultant is not a natural person, or because of any other provision of Rule 701, unless the Company determines that such grant need not comply with the requirements of Rule 701 and will satisfy another exemption under the Securities Act as well as comply with the securities laws of all other relevant jurisdictions**.**

5. PROVISIONS RELATING TO OPTIONS AND STOCK APPRECIATION RIGHTS.

Each Option or SAR will be in such form and will contain such terms and conditions as the Board deems appropriate. All Options will be separately designated Incentive Stock Options or Nonstatutory Stock Options at the time of grant, and, if certificates are issued, a separate certificate or certificates will be issued for shares of Common Stock purchased on exercise of each type of Option. If an Option is not specifically designated as an Incentive Stock Option, or if an Option is designated as an Incentive Stock Option but some portion or all of the Option fails to qualify as an Incentive Stock Option under the applicable rules, then the Option (or portion thereof) will be a Nonstatutory Stock Option. The provisions of separate Options or SARs need not be identical; *provided, however*, that each Stock Award Agreement will conform to (through incorporation of provisions hereof by reference in the applicable Stock Award Agreement or otherwise) the substance of each of the following provisions:

(a) Term. Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, no Option or SAR will be exercisable after the expiration of ten (10) years from the date of its grant or such shorter period specified in the Stock Award Agreement.

(b) Exercise Price. Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, the exercise or strike price of each Option or SAR will be not less than one

hundred percent (100%) of the Fair Market Value of the Common Stock subject to the Option or SAR on the date the Stock Award is granted. Notwithstanding the foregoing, an Option or SAR may be granted with an exercise or strike price lower than one hundred percent (100%) of the Fair Market Value of the Common Stock subject to the Stock Award if such Stock Award is granted pursuant to an assumption of or substitution for another option or stock appreciation right pursuant to a Corporate Transaction and in a manner consistent with the provisions of Section 409A of the Code and, if applicable, Section 424(a) of the Code. Each SAR will be denominated in shares of Common Stock equivalents.

(c) Purchase Price for Options. The purchase price of Common Stock acquired pursuant to the exercise of an Option may be paid, to the extent permitted by applicable law and as determined by the Board in its sole discretion, by any combination of the methods of payment set forth below. The Board will have the authority to grant Options that do not permit all of the following methods of payment (or otherwise restrict the ability to use certain methods) and to grant Options that require the consent of the Company to use a particular method of payment. The permitted methods of payment are as follows:

(i) by cash, check, bank draft or money order payable to the Company;

(ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of the stock subject to the Option, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds;

(iii) by delivery to the Company (either by actual delivery or attestation) of shares of Common Stock;

(iv) if an Option is a Nonstatutory Stock Option, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issuable upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price; provided, however, that the Company will accept a cash or other payment from the Participant to the extent of any remaining balance of the aggregate exercise price not satisfied by such reduction in the number of whole shares to be issued. Shares of Common Stock will no longer be subject to an Option and will not be exercisable thereafter to the extent that (A) shares issuable upon exercise are used to pay the exercise price pursuant to the "net exercise," (B) shares are delivered to the Participant as a result of such exercise, and (C) shares are withheld to satisfy tax withholding obligations;

(v) according to a deferred payment or similar arrangement with the Optionholder; *provided*, *however*, that interest will compound at least annually and will be charged at the minimum rate of interest necessary to avoid (A) the imputation of interest income to the Company and compensation income to the Optionholder under any applicable provisions of the Code, and (B) the classification of the Option as a liability for financial accounting purposes; or

(vi) in any other form of legal consideration that may be acceptable to the Board and specified in the applicable Stock Award Agreement.

(d) Exercise and Payment of a SAR. To exercise any outstanding SAR, the Participant must provide written notice of exercise to the Company in compliance with the provisions of the Stock Award Agreement evidencing such SAR. The appreciation distribution payable on the exercise of a SAR will be not greater than an amount equal to the excess of (A) the aggregate Fair Market Value (on the date of the exercise of the SAR) of a number of shares of Common Stock equal to the number of Common Stock equivalents in which the Participant is vested under such SAR, and with respect to which the Participant is exercising the SAR on such date, over (B) the strike price. The appreciation distribution may be paid in Common Stock, in cash, in any combination of the two or in any other form of consideration, as determined by the Board and contained in the Stock Award Agreement evidencing such SAR.

(e) Transferability of Options and SARs. The Board may, in its sole discretion, impose such limitations on the transferability of Options and SARs as the Board will determine. In the absence of such a determination by the Board to the contrary, the following restrictions on the transferability of Options and SARs will apply:

(i) Restrictions on Transfer. An Option or SAR will not be transferable except by will or by the laws of descent and distribution (and pursuant to subsections (ii) and (iii) below), and will be exercisable during the lifetime of the Participant only by the Participant. The Board may permit transfer of the Option or SAR in a manner that is not prohibited by applicable tax and securities laws. Except as explicitly provided herein, neither an Option nor a SAR may be transferred for consideration.

(ii) Domestic Relations Orders. Subject to the approval of the Board or a duly authorized Officer, an Option or SAR may be transferred pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2). If an Option is an Incentive Stock Option, such Option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(iii) Beneficiary Designation. Subject to the approval of the Board or a duly authorized Officer, a Participant may, by delivering written notice to the Company, in a form approved by the Company (or the designated broker), designate a third party who, upon the death of the Participant, will thereafter be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, the executor or administrator of the Participant's estate will be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. However, the Company may prohibit designation of a beneficiary at any time, including due to any conclusion by the Company that such designation would be inconsistent with the provisions of applicable laws.

(f) Vesting Generally. The total number of shares of Common Stock subject to an Option or SAR may vest and therefore become exercisable in periodic installments that may or may not be equal. The Option or SAR may be subject to such other terms and conditions on the time or times when it may or may not be exercised (which may be based on the satisfaction of performance goals or other criteria) as the Board may deem appropriate. The vesting provisions of individual Options or SARs may vary. The provisions of this Section 5(f) are subject to any

Option or SAR provisions governing the minimum number of shares of Common Stock as to which an Option or SAR may be exercised.

(g) Termination of Continuous Service. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company, if a Participant's Continuous Service terminates (other than for Cause and other than upon the Participant's death or Disability), the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such Stock Award as of the date of termination of Continuous Service) within the period of time ending on the earlier of (i) the date three (3) months following the termination of the Participant's Continuous Service (or such longer or shorter period specified in the applicable Stock Award Agreement, which period will not be less than thirty (30) days if necessary to comply with applicable laws unless such termination is for Cause) and (ii) the expiration of the term of the Option or SAR as set forth in the Stock Award Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Option or SAR within the applicable time frame, the Option or SAR (as applicable) will terminate.

(h) Extension of Termination Date. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company, if the exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause and other than upon the Participant's death or Disability) would be prohibited at any time solely because the issuance of shares of Common Stock would violate the registration requirements under the Securities Act, then the Option or SAR will terminate on the earlier of (i) the expiration of a total period of three (3) months (that need not be consecutive) after the termination of the Participant's Continuous Service during which the exercise of the Option or SAR would not be in violation of such registration requirements, or (ii) the expiration of the term of the Option or SAR as set forth in the applicable Stock Award Agreement. In addition, unless otherwise provided in a Participant's Stock Award Agreement, if the sale of any Common Stock received upon exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause) would violate the Company's insider trading policy, then the Option or SAR will terminate on the earlier of (i) the expiration of a period of time (that need not be consecutive) equal to the applicable post-termination exercise period after the termination of the Participant's Continuous Service during which the sale of the Common Stock received upon exercise of the Option or SAR would not be in violation of the Company's insider trading policy, or (ii) the expiration of the term of the Option or SAR as set forth in the applicable Stock Award Agreement.

(i) Disability of Participant. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company, if a Participant's Continuous Service terminates as a result of the Participant's Disability, the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such Option or SAR as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date twelve (12) months following such termination of Continuous Service (or such longer or shorter period specified in the Stock Award Agreement, which period will not be less than six (6) months if necessary to comply with applicable laws), and (ii) the expiration of the term of the Option or SAR as set forth in the Stock Award Agreement. If, after termination of Continuous Service, the Participant does not exercise

his or her Option or SAR within the applicable time frame, the Option or SAR (as applicable) will terminate.

(j) Death of Participant. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company, if (i) a Participant's Continuous Service terminates as a result of the Participant's death, or (ii) the Participant dies within the period (if any) specified in the Stock Award Agreement for exercisability after the termination of the Participant's Continuous Service (for a reason other than death), then the Option or SAR may be exercised (to the extent the Participant was entitled to exercise such Option or SAR as of the date of death) by the Participant's estate, by a person who acquired the right to exercise the Option or SAR by bequest or inheritance or by a person designated to exercise the Option or SAR upon the Participant's death, but only within the period ending on the earlier of (i) the date eighteen (18) months following the date of death (or such longer or shorter period specified in the Stock Award Agreement, which period will not be less than six (6) months if necessary to comply with applicable laws), and (ii) the expiration of the term of such Option or SAR as set forth in the Stock Award Agreement. If, after the Participant's death, the Option or SAR is not exercised within the applicable time frame, the Option or SAR (as applicable) will terminate.

(k) Termination for Cause. Except as explicitly provided otherwise in a Participant's Stock Award Agreement or other individual written agreement between the Company or any Affiliate and the Participant, if a Participant's Continuous Service is terminated for Cause, the Option or SAR will terminate immediately upon such Participant's termination of Continuous Service, and the Participant will be prohibited from exercising his or her Option or SAR from and after the time of such termination of Continuous Service.

(l) Non-Exempt Employees. If an Option or SAR is granted to an Employee who is a non-exempt employee for purposes of the Fair Labor Standards Act of 1938, as amended, the Option or SAR will not be first exercisable for any shares of Common Stock until at least six (6) months following the date of grant of the Option or SAR (although the Stock Award may vest prior to such date). Consistent with the provisions of the Worker Economic Opportunity Act, (i) if such non-exempt Employee dies or suffers a Disability, (ii) upon a Corporate Transaction in which such Option or SAR is not assumed, continued, or substituted, (iii) upon a Change in Control, or (iv) upon the Participant's retirement (as such term may be defined in the Participant's Stock Award Agreement, in another agreement between the Participant and the Company, or, if no such definition, in accordance with the Company's then current employment policies and guidelines), the vested portion of any Options and SARs may be exercised earlier than six (6) months following the date of grant. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise or vesting of an Option or SAR will be exempt from his or her regular rate of pay. To the extent permitted and/or required for compliance with the Worker Economic Opportunity Act to ensure that any income derived by a non-exempt employee in connection with the exercise, vesting or issuance of any shares under any other Stock Award will be exempt from the employee's regular rate of pay, the provisions of this Section 5(l) will apply to all Stock Awards and are hereby incorporated by reference into such Stock Award Agreements.

(m) Early Exercise of Options. An Option may, but need not, include a provision whereby the Optionholder may elect at any time before the Optionholder's Continuous Service terminates to exercise the Option as to any part or all of the shares of Common Stock subject to the Option prior to the full vesting of the Option. Subject to the "Repurchase Limitation" in Section 8(m), any unvested shares of Common Stock so purchased may be subject to a repurchase right in favor of the Company or to any other restriction the Board determines to be appropriate. Provided that the "Repurchase Limitation" in Section 8(m) is not violated, the Company will not be required to exercise its repurchase right until at least six (6) months (or such longer or shorter period of time required to avoid classification of the Option as a liability for financial accounting purposes) have elapsed following exercise of the Option unless the Board otherwise specifically provides in the Option Agreement.

(n) Right of Repurchase. Subject to the "Repurchase Limitation" in Section 8(m), the Option or SAR may include a provision whereby the Company may elect to repurchase all or any part of the vested shares of Common Stock acquired by the Participant pursuant to the exercise of the Option or SAR.

(o) Right of First Refusal. The Option or SAR may include a provision whereby the Company may elect to exercise a right of first refusal following receipt of notice from the Participant of the intent to transfer all or any part of the shares of Common Stock received upon the exercise of the Option or SAR. Such right of first refusal will be subject to the "Repurchase Limitation" in Section 8(m). Except as expressly provided in this Section 5(o) or in the Stock Award Agreement, such right of first refusal will otherwise comply with any applicable provisions of the bylaws of the Company.

6. PROVISIONS OF STOCK AWARDS OTHER THAN OPTIONS AND SARS.

(a) Restricted Stock Awards. Each Restricted Stock Award Agreement will be in such form and will contain such terms and conditions as the Board deems appropriate. To the extent consistent with the Company's bylaws, at the Board's election, shares of Common Stock may be (i) held in book entry form subject to the Company's instructions until any restrictions relating to the Restricted Stock Award lapse; or (ii) evidenced by a certificate, which certificate will be held in such form and manner as determined by the Board. The terms and conditions of Restricted Stock Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Award Agreements need not be identical. Each Restricted Stock Award Agreement will conform to (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. A Restricted Stock Award may be awarded in consideration for (A) cash, check, bank draft or money order payable to the Company, (B) past services to the Company or an Affiliate, or (C) any other form of legal consideration (including future services) that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. Subject to the "Repurchase Limitation" in Section 8(m), shares of Common Stock awarded under the Restricted Stock Award Agreement may be subject to forfeiture to the Company in accordance with a vesting schedule to be determined by the Board.

(iii) Termination of Participant's Continuous Service. If a Participant's Continuous Service terminates, the Company may receive through a forfeiture condition or a repurchase right, any or all of the shares of Common Stock held by the Participant that have not vested as of the date of termination of Continuous Service under the terms of the Restricted Stock Award Agreement.

(iv) Transferability. Rights to acquire shares of Common Stock under the Restricted Stock Award Agreement will be transferable by the Participant only upon such terms and conditions as are set forth in the Restricted Stock Award Agreement, as the Board will determine in its sole discretion, so long as Common Stock awarded under the Restricted Stock Award Agreement remains subject to the terms of the Restricted Stock Award Agreement.

(v) Dividends. A Restricted Stock Award Agreement may provide that any dividends paid on Restricted Stock will be subject to the same vesting and forfeiture restrictions as apply to the shares subject to the Restricted Stock Award to which they relate.

(b) Restricted Stock Unit Awards. Each Restricted Stock Unit Award Agreement will be in such form and will contain such terms and conditions as the Board deems appropriate. The terms and conditions of Restricted Stock Unit Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Unit Award Agreements need not be identical. Each Restricted Stock Unit Award Agreement will conform to (through incorporation of the provisions hereof by reference in the Agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. At the time of grant of a Restricted Stock Unit Award, the Board will determine the consideration, if any, to be paid by the Participant upon delivery of each share of Common Stock subject to the Restricted Stock Unit Award. The consideration to be paid (if any) by the Participant for each share of Common Stock subject to a Restricted Stock Unit Award may be paid in any form of legal consideration that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. At the time of the grant of a Restricted Stock Unit Award, the Board may impose such restrictions on or conditions to the vesting of the Restricted Stock Unit Award as it, in its sole discretion, deems appropriate.

(iii) Payment. A Restricted Stock Unit Award may be settled by the delivery of shares of Common Stock, their cash equivalent, any combination thereof or in any other form of consideration, as determined by the Board and contained in the Restricted Stock Unit Award Agreement.

(iv) Additional Restrictions. At the time of the grant of a Restricted Stock Unit Award, the Board, as it deems appropriate, may impose such restrictions or conditions that delay the delivery of the shares of Common Stock (or their cash equivalent) subject to a Restricted Stock Unit Award to a time after the vesting of such Restricted Stock Unit Award.

(v) Dividend Equivalents. Dividend equivalents may be credited in respect of shares of Common Stock covered by a Restricted Stock Unit Award, as determined by the Board and contained in the Restricted Stock Unit Award Agreement. At the sole discretion of

the Board, such dividend equivalents may be converted into additional shares of Common Stock covered by the Restricted Stock Unit Award in such manner as determined by the Board. Any additional shares covered by the Restricted Stock Unit Award credited by reason of such dividend equivalents will be subject to all of the same terms and conditions of the underlying Restricted Stock Unit Award Agreement to which they relate.

(vi) Termination of Participant's Continuous Service. Except as otherwise provided in the applicable Restricted Stock Unit Award Agreement, such portion of the Restricted Stock Unit Award that has not vested will be forfeited upon the Participant's termination of Continuous Service.

(vii) Compliance with Section 409A of the Code. Notwithstanding anything to the contrary set forth herein, any Restricted Stock Unit Award granted under the Plan that is not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Restricted Stock Unit Award will comply with the requirements of Section 409A of the Code. Such restrictions, if any, shall be determined by the Board and contained in the Restricted Stock Unit Award Agreement evidencing such Restricted Stock Unit Award. For example, such restrictions may include, without limitation, a requirement that any Common Stock that is to be issued in a year following the year in which the Restricted Stock Unit Award vests must be issued in accordance with a fixed pre-determined schedule.

(c) Other Stock Awards. Other forms of Stock Awards valued in whole or in part by reference to, or otherwise based on, Common Stock, including the appreciation in value thereof (e.g., options or stock rights with an exercise price or strike price less than one hundred percent (100%) of the Fair Market Value of the Common Stock at the time of grant) may be granted either alone or in addition to Stock Awards provided for under Section 5 and the preceding provisions of this Section 6. Subject to the provisions of the Plan, the Board will have sole and complete authority to determine the persons to whom and the time or times at which such Other Stock Awards will be granted, the number of shares of Common Stock (or the cash equivalent thereof) to be granted pursuant to such Other Stock Awards and all other terms and conditions of such Other Stock Awards.

7. COVENANTS OF THE COMPANY.

(a) Availability of Shares. The Company will keep available at all times the number of shares of Common Stock reasonably required to satisfy then-outstanding Stock Awards.

(b) Securities Law Compliance. The Company will seek to obtain from each regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Stock Awards and to issue and sell shares of Common Stock upon exercise of the Stock Awards; *provided*, *however,* that this undertaking will not require the Company to register under the Securities Act the Plan, any Stock Award or any Common Stock issued or issuable pursuant to any such Stock Award. If, after reasonable efforts and at a reasonable cost, the Company is unable to obtain from any such regulatory commission or agency the authority that counsel for the Company deems necessary for the lawful issuance and sale of Common Stock under the Plan, the Company will be relieved from any liability for failure to issue and sell Common Stock upon exercise of such Stock Awards unless and until such authority is obtained.

A Participant will not be eligible for the grant of a Stock Award or the subsequent issuance of cash or Common Stock pursuant to the Stock Award if such grant or issuance would be in violation of any applicable securities law.

(c) No Obligation to Notify or Minimize Taxes. The Company will have no duty or obligation to any Participant to advise such holder as to the time or manner of exercising such Stock Award. Furthermore, the Company will have no duty or obligation to warn or otherwise advise such holder of a pending termination or expiration of a Stock Award or a possible period in which the Stock Award may not be exercised. The Company has no duty or obligation to minimize the tax consequences of a Stock Award to the holder of such Stock Award.

8. MISCELLANEOUS.

(a) Use of Proceeds from Sales of Common Stock. Proceeds from the sale of shares of Common Stock pursuant to Stock Awards will constitute general funds of the Company.

(b) Corporate Action Constituting Grant of Stock Awards. Corporate action constituting a grant by the Company of a Stock Award to any Participant will be deemed completed as of the date of such corporate action, unless otherwise determined by the Board, regardless of when the instrument, certificate, or letter evidencing the Stock Award is communicated to, or actually received or accepted by, the Participant. In the event that the corporate records (e.g., Board consents, resolutions or minutes) documenting the corporate action constituting the grant contain terms (e.g., exercise price, vesting schedule or number of shares) that are inconsistent with those in the Stock Award Agreement as a result of a clerical error in the papering of the Stock Award Agreement, the corporate records will control and the Participant will have no legally binding right to the incorrect term in the Stock Award Agreement.

(c) Stockholder Rights. No Participant will be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares of Common Stock subject to a Stock Award unless and until (i) such Participant has satisfied all requirements for exercise of, or the issuance of shares of Common Stock under, the Stock Award pursuant to its terms, and (ii) the issuance of the Common Stock subject to the Stock Award has been entered into the books and records of the Company.

(d) No Employment or Other Service Rights. Nothing in the Plan, any Stock Award Agreement or any other instrument executed thereunder or in connection with any Stock Award granted pursuant thereto will confer upon any Participant any right to continue to serve the Company or an Affiliate in the capacity in effect at the time the Stock Award was granted or will affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (iii) the service of a Director pursuant to the bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(e) Change in Time Commitment. In the event a Participant's regular level of time commitment in the performance of his or her services for the Company and any Affiliates is reduced (for example, and without limitation, if the Participant is an Employee of the Company and the Employee has a change in status from a full-time Employee to a part-time Employee) after the date of grant of any Stock Award to the Participant, the Board has the right in its sole discretion to (x) make a corresponding reduction in the number of shares subject to any portion of such Stock Award that is scheduled to vest or become payable after the date of such change in time commitment, and (y) in lieu of or in combination with such a reduction, extend the vesting or payment schedule applicable to such Stock Award. In the event of any such reduction, the Participant will have no right with respect to any portion of the Stock Award that is so reduced or extended.

(f) Incentive Stock Option Limitations. To the extent that the aggregate Fair Market Value (determined at the time of grant) of Common Stock with respect to which Incentive Stock Options are exercisable for the first time by any Optionholder during any calendar year (under all plans of the Company and any Affiliates) exceeds one hundred thousand dollars ($100,000) (or such other limit established in the Code) or otherwise does not comply with the rules governing Incentive Stock Options, the Options or portions thereof that exceed such limit (according to the order in which they were granted) or otherwise do not comply with such rules will be treated as Nonstatutory Stock Options, notwithstanding any contrary provision of the applicable Option Agreement(s).

(g) Investment Assurances. The Company may require a Participant, as a condition of exercising or acquiring Common Stock under any Stock Award, (i) to give written assurances satisfactory to the Company as to the Participant's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that he or she is capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Stock Award; and (ii) to give written assurances satisfactory to the Company stating that the Participant is acquiring Common Stock subject to the Stock Award for the Participant's own account and not with any present intention of selling or otherwise distributing the Common Stock. The foregoing requirements, and any assurances given pursuant to such requirements, will be inoperative if (A) the issuance of the shares upon the exercise or acquisition of Common Stock under the Stock Award has been registered under a then currently effective registration statement under the Securities Act, or (B) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the Common Stock.

(h) Withholding Obligations. Unless prohibited by the terms of a Stock Award Agreement, the Company may, in its sole discretion, satisfy any federal, state or local tax withholding obligation relating to a Stock Award by any of the following means or by a combination of such means: (i) causing the Participant to tender a cash payment; (ii) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to the Participant in connection with the Stock Award; *provided*, *however*, that no shares of Common

Stock are withheld with a value exceeding the minimum amount of tax required to be withheld by law (or such lesser amount as may be necessary to avoid classification of the Stock Award as a liability for financial accounting purposes); (iii) withholding cash from a Stock Award settled in cash; (iv) withholding payment from any amounts otherwise payable to the Participant; or (v) by such other method as may be set forth in the Stock Award Agreement.

(i) Electronic Delivery. Any reference herein to a "written" agreement or document will include any agreement or document delivered electronically or posted on the Company's intranet (or other shared electronic medium controlled by the Company to which the Participant has access).

(j) Deferrals. To the extent permitted by applicable law, the Board, in its sole discretion, may determine that the delivery of Common Stock or the payment of cash, upon the exercise, vesting or settlement of all or a portion of any Stock Award may be deferred and may establish programs and procedures for deferral elections to be made by Participants. Deferrals by Participants will be made in accordance with Section 409A of the Code. Consistent with Section 409A of the Code, the Board may provide for distributions while a Participant is still an employee or otherwise providing services to the Company. The Board is authorized to make deferrals of Stock Awards and determine when, and in what annual percentages, Participants may receive payments, including lump sum payments, following the Participant's termination of Continuous Service, and implement such other terms and conditions consistent with the provisions of the Plan and in accordance with applicable law.

(k) Compliance with Section 409A of the Code. To the extent that the Board determines that any Stock Award granted hereunder is subject to Section 409A of the Code, the Stock Award Agreement evidencing such Stock Award shall incorporate the terms and conditions necessary to avoid the consequences specified in Section 409A(a)(1) of the Code. To the extent applicable, the Plan and Stock Award Agreements shall be interpreted in accordance with Section 409A of the Code.

(l) Compliance with Exemption Provided by Rule 12h-1(f). If at the end of the Company's most recently completed fiscal year: (i) the aggregate of the number of persons who hold outstanding compensatory employee stock options to purchase shares of Common Stock granted pursuant to the Plan or otherwise (such persons, "***Holders of Options***") equals or exceeds five hundred (500), and (ii) the Company's assets exceed $10 million, then the following restrictions will apply during any period during which the Company does not have a class of its securities registered under Section 12 of the Exchange Act and is not required to file reports under Section 15(d) of the Exchange Act: (A) the Options and, prior to exercise, the shares of Common Stock to be issued on exercise of the Options may not be transferred until the Company is no longer relying on the exemption provided by Rule 12h-1(f) promulgated under the Exchange Act ("***Rule 12h-1(f)***"), except: (1) as permitted by Rule 701(c) promulgated under the Securities Act, (2) to a guardian upon the disability of the Holder of Options, or (3) to an executor upon the death of the Holder of Options (collectively, the "***Permitted Transferees***"); provided, however, the following transfers are permitted: (i) transfers by Holders of Options to the Company, and (ii) transfers in connection with a change of control or other acquisition involving the Company, if following such transaction, the Options no longer remain outstanding and the Company is no longer relying on the exemption provided by Rule 12h-1(f); provided

further, that any Permitted Transferees may not further transfer the Options; (B) except as otherwise provided in (A) above, the Options and shares of Common Stock issuable on exercise of the Options are restricted as to any pledge, hypothecation, or other transfer, including any short position, any "put equivalent position" as defined by Rule 16a-1(h) promulgated under the Exchange Act, or any "call equivalent position" as defined by Rule 16a-1(b) promulgated under the Exchange Act by Holders of Options prior to exercise of an Option until the Company is no longer relying on the exemption provided by Rule 12h-1(f); and (C) at any time that the Company is relying on the exemption provided by Rule 12h-1(f), the Company will deliver to Holders of Options (whether by physical or electronic delivery or written notice of the availability of the information on an internet site) the information required by Rule 701(e)(3), (4), and (5) promulgated under the Securities Act every six (6) months, including financial statements that are not more than one hundred eighty (180) days old; provided, however, that the Company may condition the delivery of such information upon the Holder of Options' agreement to maintain its confidentiality.

(m) Repurchase Limitation. The terms of any repurchase right will be specified in the Stock Award Agreement. The repurchase price for vested shares of Common Stock will be the Fair Market Value of the shares of Common Stock on the date of repurchase. The repurchase price for unvested shares of Common Stock will be the lower of (i) the Fair Market Value of the shares of Common Stock on the date of repurchase or (ii) their original purchase price. However, the Company will not exercise its repurchase right until at least six (6) months (or such longer or shorter period of time necessary to avoid classification of the Stock Award as a liability for financial accounting purposes) have elapsed following delivery of shares of Common Stock subject to the Stock Award, unless otherwise specifically provided by the Board.

9. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; OTHER CORPORATE EVENTS.

(a) Capitalization Adjustments. In the event of a Capitalization Adjustment, the Board will appropriately and proportionately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of Incentive Stock Options pursuant to Section 3(c), and (iii) the class(es) and number of securities and price per share of stock subject to outstanding Stock Awards. The Board will make such adjustments, and its determination will be final, binding and conclusive.

(b) Dissolution or Liquidation. Except as otherwise provided in the Stock Award Agreement, in the event of a dissolution or liquidation of the Company, all outstanding Stock Awards (other than Stock Awards consisting of vested and outstanding shares of Common Stock not subject to a forfeiture condition or the Company's right of repurchase) will terminate immediately prior to the completion of such dissolution or liquidation, and the shares of Common Stock subject to the Company's repurchase rights or subject to a forfeiture condition may be repurchased or reacquired by the Company notwithstanding the fact that the holder of such Stock Award is providing Continuous Service, *provided*, *however,* that the Board may, in its sole discretion, cause some or all Stock Awards to become fully vested, exercisable and/or no longer subject to repurchase or forfeiture (to the extent such Stock Awards have not previously expired or terminated) before the dissolution or liquidation is completed but contingent on its completion.

(c) Corporate Transaction. The following provisions will apply to Stock Awards in the event of a Corporate Transaction unless otherwise provided in the instrument evidencing the Stock Award or any other written agreement between the Company or any Affiliate and the Participant or unless otherwise expressly provided by the Board at the time of grant of a Stock Award. In the event of a Corporate Transaction, then, notwithstanding any other provision of the Plan, the Board may take one or more of the following actions with respect to Stock Awards, contingent upon the closing or completion of the Corporate Transaction:

(i) arrange for the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) to assume or continue the Stock Award or to substitute a similar stock award for the Stock Award (including, but not limited to, an award to acquire the same consideration paid to the stockholders of the Company pursuant to the Corporate Transaction);

(ii) arrange for the assignment of any reacquisition or repurchase rights held by the Company in respect of Common Stock issued pursuant to the Stock Award to the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company);

(iii) accelerate the vesting, in whole or in part, of the Stock Award (and, if applicable, the time at which the Stock Award may be exercised) to a date prior to the effective time of such Corporate Transaction as the Board determines (or, if the Board does not determine such a date, to the date that is five (5) days prior to the effective date of the Corporate Transaction), with such Stock Award terminating if not exercised (if applicable) at or prior to the effective time of the Corporate Transaction; provided, however, that the Board may require Participants to complete and deliver to the Company a notice of exercise before the effective date of a Corporate Transaction, which exercise is contingent upon the effectiveness of such Corporate Transaction;

(iv) arrange for the lapse, in whole or in part, of any reacquisition or repurchase rights held by the Company with respect to the Stock Award;

(v) cancel or arrange for the cancellation of the Stock Award, to the extent not vested or not exercised prior to the effective time of the Corporate Transaction, in exchange for such cash consideration, if any, as the Board, in its sole discretion, may consider appropriate; and

(vi) make a payment, in such form as may be determined by the Board equal to the excess, if any, of (A) the value of the property the Participant would have received upon the exercise of the Stock Award immediately prior to the effective time of the Corporate Transaction, over (B) any exercise price payable by such holder in connection with such exercise. For clarity, this payment may be zero ($0) if the value of the property is equal to or less than the exercise price. Payments under this provision may be delayed to the same extent that payment of consideration to the holders of the Company's Common Stock in connection with the Corporate Transaction is delayed as a result of escrows, earn outs, holdbacks or any other contingencies.

The Board need not take the same action or actions with respect to all Stock Awards or portions thereof or with respect to all Participants. The Board may take different actions with respect to the vested and unvested portions of a Stock Award.

(d) Change in Control. A Stock Award may be subject to additional acceleration of vesting and exercisability upon or after a Change in Control as may be provided in the Stock Award Agreement for such Stock Award or as may be provided in any other written agreement between the Company or any Affiliate and the Participant, but in the absence of such provision, no such acceleration will occur.

10. PLAN TERM; EARLIER TERMINATION OR SUSPENSION OF THE PLAN.

(a) Plan Term. The Board may suspend or terminate the Plan at any time. Unless terminated sooner by the Board, the Plan will automatically terminate on the day before the tenth (10th) anniversary of the earlier of (i) the date the Plan is adopted by the Board, or (ii) the date the Plan is approved by the stockholders of the Company. No Stock Awards may be granted under the Plan while the Plan is suspended or after it is terminated.

(b) No Impairment of Rights. Suspension or termination of the Plan will not impair rights and obligations under any Stock Award granted while the Plan is in effect except with the written consent of the affected Participant or as otherwise permitted in the Plan.

11. EFFECTIVE DATE OF PLAN.

This Plan will become effective on the Effective Date.

12. CHOICE OF LAW.

The laws of the State of Delaware will govern all questions concerning the construction, validity and interpretation of this Plan, without regard to that state's conflict of laws rules.

13. DEFINITIONS. As used in the Plan, the following definitions will apply to the capitalized terms indicated below:

(a) "***Affiliate***" means, at the time of determination, any "parent" or "majority-owned subsidiary" of the Company, as such terms are defined in Rule 405. The Board will have the authority to determine the time or times at which "parent" or "majority-owned subsidiary" status is determined within the foregoing definition.

(b) "***Board***" means the Board of Directors of the Company.

(c) "***Capitalization Adjustment***" means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Stock Award after the Effective Date without the receipt of consideration by the Company through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, large nonrecurring cash dividend, stock split, reverse stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure, or any similar equity restructuring transaction, as that term is used in Statement of Financial

Accounting Standards Board Accounting Standards Codification Topic 718 (or any successor thereto). Notwithstanding the foregoing, the conversion of any convertible securities of the Company will not be treated as a Capitalization Adjustment.

(d) "***Cause***" will have the meaning ascribed to such term in any written agreement between the Participant and the Company defining such term and, in the absence of such agreement, such term means, with respect to a Participant, the occurrence of any of the following events: (i) such Participant's commission of any felony or any crime involving fraud, dishonesty or moral turpitude under the laws of the United States or any state thereof; (ii) such Participant's attempted commission of, or participation in, a fraud or act of dishonesty against the Company; (iii) such Participant's intentional, material violation of any contract or agreement between the Participant and the Company or of any statutory duty owed to the Company; (iv) such Participant's unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) such Participant's gross misconduct. The determination that a termination of the Participant's Continuous Service is either for Cause or without Cause will be made by the Company, in its sole discretion. Any determination by the Company that the Continuous Service of a Participant was terminated with or without Cause for the purposes of outstanding Stock Awards held by such Participant will have no effect upon any determination of the rights or obligations of the Company or such Participant for any other purpose.

(e) "***Change in Control***" means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) any Exchange Act Person becomes the Owner, directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the combined voting power of the Company's then outstanding securities other than by virtue of a merger, consolidation or similar transaction. Notwithstanding the foregoing, a Change in Control will not be deemed to occur (A) on account of the acquisition of securities of the Company directly from the Company, (B) on account of the acquisition of securities of the Company by an investor, any affiliate thereof or any other Exchange Act Person that acquires the Company's securities in a transaction or series of related transactions the primary purpose of which is to obtain financing for the Company through the issuance of equity securities or (C) solely because the level of Ownership held by any Exchange Act Person (the "***Subject Person***") exceeds the designated percentage threshold of the outstanding voting securities as a result of a repurchase or other acquisition of voting securities by the Company reducing the number of shares outstanding, provided that if a Change in Control would occur (but for the operation of this sentence) as a result of the acquisition of voting securities by the Company, and after such share acquisition, the Subject Person becomes the Owner of any additional voting securities that, assuming the repurchase or other acquisition had not occurred, increases the percentage of the then outstanding voting securities Owned by the Subject Person over the designated percentage threshold, then a Change in Control will be deemed to occur;

(ii) there is consummated a merger, consolidation or similar transaction involving (directly or indirectly) the Company and, immediately after the consummation of such merger, consolidation or similar transaction, the stockholders of the Company immediately prior thereto do not Own, directly or indirectly, either (A) outstanding voting securities representing more than fifty percent (50%) of the combined outstanding voting power of the surviving Entity

in such merger, consolidation or similar transaction or (B) more than fifty percent (50%) of the combined outstanding voting power of the parent of the surviving Entity in such merger, consolidation or similar transaction, in each case in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such transaction;

(iii) the stockholders of the Company approve or the Board approves a plan of complete dissolution or liquidation of the Company, or a complete dissolution or liquidation of the Company will otherwise occur, except for a liquidation into a parent corporation; or

(iv) there is consummated a sale, lease, exclusive license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries, other than a sale, lease, license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries to an Entity, more than fifty percent (50%) of the combined voting power of the voting securities of which are Owned by stockholders of the Company in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such sale, lease, license or other disposition.

Notwithstanding the foregoing definition or any other provision of this Plan, (A) the term Change in Control will not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company, and (B) the definition of Change in Control (or any analogous term) in an individual written agreement between the Company or any Affiliate and the Participant will supersede the foregoing definition with respect to Stock Awards subject to such agreement; *provided, however,* that if no definition of Change in Control or any analogous term is set forth in such an individual written agreement, the foregoing definition will apply.

(f) "***Code***" means the Internal Revenue Code of 1986, as amended, including any applicable regulations and guidance thereunder.

(g) "***Committee***" means a committee of one (1) or more Directors to whom authority has been delegated by the Board in accordance with Section 2(c).

(h) "***Common Stock***" means the common stock of the Company.

(i) "***Company***" means Celladon Corporation, a Delaware corporation.

(j) "***Consultant***" means any person, including an advisor, who is (i) engaged by the Company or an Affiliate to render consulting or advisory services and is compensated for such services, or (ii) serving as a member of the board of directors of an Affiliate and is compensated for such services. However, service solely as a Director, or payment of a fee for such service, will not cause a Director to be considered a "Consultant" for purposes of the Plan.

(k) "***Continuous Service***" means that the Participant's service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. A change in the capacity in which the Participant renders service to the Company or an Affiliate as an Employee, Director or Consultant or a change in the Entity for which the Participant renders such service, provided that there is no interruption or termination of the Participant's service

with the Company or an Affiliate, will not terminate a Participant's Continuous Service; *provided, however*, that if the Entity for which a Participant is rendering services ceases to qualify as an Affiliate, as determined by the Board in its sole discretion, such Participant's Continuous Service will be considered to have terminated on the date such Entity ceases to qualify as an Affiliate. For example, a change in status from an Employee of the Company to a Consultant of an Affiliate or to a Director will not constitute an interruption of Continuous Service. To the extent permitted by law, the Board or the chief executive officer of the Company, in that party's sole discretion, may determine whether Continuous Service will be considered interrupted in the case of (i) any leave of absence approved by the Board or chief executive officer, including sick leave, military leave or any other personal leave, or (ii) transfers between the Company, an Affiliate, or their successors. Notwithstanding the foregoing, a leave of absence will be treated as Continuous Service for purposes of vesting in a Stock Award only to such extent as may be provided in the Company's leave of absence policy, in the written terms of any leave of absence agreement or policy applicable to the Participant, or as otherwise required by law.

(l) "***Corporate Transaction***" means the consummation, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) a sale or other disposition of all or substantially all, as determined by the Board in its sole discretion, of the consolidated assets of the Company and its Subsidiaries;

(ii) a sale or other disposition of at least ninety percent (90%) of the outstanding securities of the Company;

(iii) a merger, consolidation or similar transaction following which the Company is not the surviving corporation; or

(iv) a merger, consolidation or similar transaction following which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted or exchanged by virtue of the merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

(m) "***Director***" means a member of the Board.

(n) "***Disability***" means, with respect to a Participant, the inability of such Participant to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than twelve (12) months as provided in Sections 22(e)(3) and 409A(a)(2)(c)(i) of the Code, and will be determined by the Board on the basis of such medical evidence as the Board deems warranted under the circumstances.

(o) "***Effective Date***" means the effective date of this Plan, which is the earlier of (i) the date that this Plan is first approved by the Company's stockholders, and (ii) the date this Plan is adopted by the Board.

(p) "***Employee***" means any person employed by the Company or an Affiliate. However, service solely as a Director, or payment of a fee for such services, will not cause a Director to be considered an "Employee" for purposes of the Plan.

(q) "***Entity***" means a corporation, partnership, limited liability company or other entity.

(r) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

(s) "***Exchange Act Person***" means any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act), except that "Exchange Act Person" will not include (i) the Company or any Subsidiary of the Company, (ii) any employee benefit plan of the Company or any Subsidiary of the Company or any trustee or other fiduciary holding securities under an employee benefit plan of the Company or any Subsidiary of the Company, (iii) an underwriter temporarily holding securities pursuant to an offering of such securities, (iv) an Entity Owned, directly or indirectly, by the stockholders of the Company in substantially the same proportions as their Ownership of stock of the Company; or (v) any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act) that, as of the Effective Date, is the Owner, directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the combined voting power of the Company's then outstanding securities.

(t) "***Fair Market Value***" means, as of any date, the value of the Common Stock determined by the Board in compliance with Section 409A of the Code or, in the case of an Incentive Stock Option, in compliance with Section 422 of the Code.

(u) "***Incentive Stock Option***" means an option granted pursuant to Section 5 of the Plan that is intended to be, and that qualifies as, an "incentive stock option" within the meaning of Section 422 of the Code.

(v) "***Nonstatutory Stock Option***" means any option granted pursuant to Section 5 of the Plan that does not qualify as an Incentive Stock Option.

(w) "***Officer***" means any person designated by the Company as an officer.

(x) "***Option***" means an Incentive Stock Option or a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(y) "***Option Agreement***" means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an Option grant. Each Option Agreement will be subject to the terms and conditions of the Plan.

(z) "***Optionholder***" means a person to whom an Option is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Option.

(aa) *"Other Stock Award"* means an award based in whole or in part by reference to the Common Stock which is granted pursuant to the terms and conditions of Section 6(c).

(bb) ***"Other Stock Award Agreement"*** means a written agreement between the Company and a holder of an Other Stock Award evidencing the terms and conditions of an Other Stock Award grant. Each Other Stock Award Agreement will be subject to the terms and conditions of the Plan.

(cc) "***Own***," "***Owned***," "***Owner***," "***Ownership***" A person or Entity will be deemed to "Own," to have "Owned," to be the "Owner" of, or to have acquired "Ownership" of securities if such person or Entity, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares voting power, which includes the power to vote or to direct the voting, with respect to such securities.

(dd) "***Participant***" means a person to whom a Stock Award is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Stock Award.

(ee) "***Plan***" means this Celladon Corporation 2012 Equity Incentive Plan.

(ff) "***Restricted Stock Award***" means an award of shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(a).

(gg) "***Restricted Stock Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Award evidencing the terms and conditions of a Restricted Stock Award grant. Each Restricted Stock Award Agreement will be subject to the terms and conditions of the Plan.

(hh) "***Restricted Stock Unit Award***" means a right to receive shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(b).

(ii) "***Restricted Stock Unit Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Unit Award evidencing the terms and conditions of a Restricted Stock Unit Award grant. Each Restricted Stock Unit Award Agreement will be subject to the terms and conditions of the Plan.

(jj) "***Rule 405***" means Rule 405 promulgated under the Securities Act.

(kk) "***Rule 701***" means Rule 701 promulgated under the Securities Act.

(ll) "***Securities Act***" means the Securities Act of 1933, as amended.

(mm) "***Stock Appreciation Right***" or "***SAR***" means a right to receive the appreciation on Common Stock that is granted pursuant to the terms and conditions of Section 5.

(nn) "***Stock Appreciation Right Agreement***" means a written agreement between the Company and a holder of a Stock Appreciation Right evidencing the terms and conditions of a Stock Appreciation Right grant. Each Stock Appreciation Right Agreement will be subject to the terms and conditions of the Plan.

(oo) "***Stock Award***" means any right to receive Common Stock granted under the Plan, including an Incentive Stock Option, a Nonstatutory Stock Option, a Restricted Stock Award, a Restricted Stock Unit Award, a Stock Appreciation Right or any Other Stock Award.

(pp) "***Stock Award Agreement***" means a written agreement between the Company and a Participant evidencing the terms and conditions of a Stock Award grant. Each Stock Award Agreement will be subject to the terms and conditions of the Plan.

(qq) "***Subsidiary***" means, with respect to the Company, (i) any corporation of which more than fifty percent (50%) of the outstanding capital stock having ordinary voting power to elect a majority of the board of directors of such corporation (irrespective of whether, at the time, stock of any other class or classes of such corporation will have or might have voting power by reason of the happening of any contingency) is at the time, directly or indirectly, Owned by the Company, and (ii) any partnership, limited liability company or other entity in which the Company has a direct or indirect interest (whether in the form of voting or participation in profits or capital contribution) of more than fifty percent (50%) .

(rr) "***Ten Percent Stockholder***" means a person who Owns (or is deemed to Own pursuant to Section 424(d) of the Code) stock possessing more than ten percent (10%) of the total combined voting power of all classes of stock of the Company or any Affiliate

CELLADON CORPORATION
STOCK OPTION GRANT NOTICE
(2012 EQUITY INCENTIVE PLAN)

Celladon Corporation (the "***Company***"), pursuant to its 2012 Equity Incentive Plan (the "***Plan***"), hereby grants to Optionholder an option to purchase the number of shares of the Company's Common Stock set forth below. This option is subject to all of the terms and conditions as set forth in this notice, in the Option Agreement, the Plan and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Option Agreement will have the same definitions as in the Plan or the Option Agreement. If there is any conflict between the terms in this notice and the Plan, the terms of the Plan will control.

Optionholder:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Shares Subject to Option:	_____
Exercise Price (Per Share):	_____
Total Exercise Price:	_____
Expiration Date:	_____

Type of Grant: ☐ Incentive Stock Option[1] ☐ Nonstatutory Stock Option

Exercise Schedule: ☐ Same as Vesting Schedule ☐ Early Exercise Permitted

Vesting Schedule: **[**One fourth **(**1/4th) of the shares vest one year after the Vesting Commencement Date; the balance of the shares vest in a series of thirty six (36) successive equal monthly installments measured from the first anniversary of the Vesting Commencement Date, subject to Optionholder's Continuous Service as of each such date.]

Payment: By one or a combination of the following items (described in the Option Agreement):

☒ By cash, check, bank draft or money order payable to the Company

☒ Pursuant to a Regulation T Program if the shares are publicly traded

☒ By delivery of already-owned shares if the shares are publicly traded

☐ By deferred payment

☒ If and only to the extent this option is a Nonstatutory Stock Option, and subject to the Company's consent at the time of exercise, by a "net exercise" arrangement

Additional Terms/Acknowledgements: Optionholder acknowledges receipt of, and understands and agrees to, this Stock Option Grant Notice, the Option Agreement and the Plan. Optionholder acknowledges and agrees that this Stock Option Grant Notice and the Option Agreement may not be modified, amended or revised except as provided in the Plan. Optionholder further acknowledges that as of the Date of Grant, this Stock Option Grant Notice, the Option Agreement, and the Plan set forth the entire understanding between Optionholder and the Company regarding this stock option award and supersede all prior oral and written agreements, promises and/or representations on that subject with the exception of (i) options previously granted and delivered to Optionholder, and (ii) the following agreements only. By accepting this option, you consent to receive such documents by

1 If this is an Incentive Stock Option, it (plus other outstanding Incentive Stock Options) cannot be first *exercisable* for more than $100,000 in value (measured by exercise price) in any calendar year. Any excess over $100,000 is a Nonstatutory Stock Option.

electronic delivery and to participate in the Plan through an on line or electronic system established and maintained by the Company or another third party designated by the Company.

OTHER AGREEMENTS: _____

_____

CELLADON CORPORATION

By: _____
Signature

Title: _____

Date: _____

OPTIONHOLDER:

_____
Signature

Date: _____

ATTACHMENTS: Option Agreement, 2012 Equity Incentive Plan and Notice of Exercise

ATTACHMENT I

CELLADON CORPORATION
2012 EQUITY INCENTIVE PLAN

OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Celladon Corporation (the "***Company***") has granted you an option under its 2012 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

1. VESTING. Your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. If you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (that is, a "***Non-Exempt Employee***"), and except as otherwise provided in the Plan, you may not exercise your option until you have completed at least six (6) months of Continuous Service measured from the Date of Grant, even if you have already been an employee for more than six (6) months. Consistent with the provisions of the Worker Economic Opportunity Act, you may exercise your option as to any vested portion prior to such six (6) month anniversary in the case of (i) your death or disability, (ii) a Corporate Transaction in which your option is not assumed, continued or substituted, (iii) a Change in Control or (iv) your termination of Continuous Service on your "retirement" (as defined in the Company's benefit plans).

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates "Early Exercise Permitted") and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the unvested portion of your option; *provided, however,* that:

(a) a partial exercise of your option will be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

(b) any shares of Common Stock so purchased from installments that have not vested as of the date of exercise will be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

(c) you will enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

(d) if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the Date of Grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds one hundred thousand dollars ($100,000), your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) will be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

(a) Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

(b) Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

(c) If this option is a Nonstatutory Stock Option, subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price

not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii) are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

(d) Pursuant to the following deferred payment alternative:

(i) Not less than one hundred percent (100%) of the aggregate exercise price, plus accrued interest, will be due four (4) years from date of exercise or, at the Company's election, upon termination of your Continuous Service.

(ii) Interest will be compounded at least annually and will be charged at the minimum rate of interest necessary to avoid (1) the treatment as interest, under any applicable provisions of the Code, of any amounts other than amounts stated to be interest under the deferred payment arrangement and (2) the classification of your option as a liability for financial accounting purposes.

(iii) In order to elect the deferred payment alternative, you must, as a part of your written notice of exercise, give notice of the election of this payment alternative and, in order to secure the payment of the deferred exercise price to the Company hereunder, if the Company so requests, you must tender to the Company a promissory note and a pledge agreement covering the purchased shares of Common Stock, both in form and substance satisfactory to the Company, or such other or additional documentation as the Company may request.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

8. TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

(a) immediately upon the termination of your Continuous Service for Cause;

(b) three (3) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 8(d) below); *provided, however,* that if during any part of such three (3) month period your option is not exercisable solely because of the condition set forth in the section above

relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service; *provided further,* that if (i) you are a Non-Exempt Employee, (ii) your Continuous Service terminates within six (6) months after the Date of Grant, and (iii) you have vested in a portion of your option at the time of your termination of Continuous Service, your option will not expire until the earlier of (x) the later of (A) the date that is seven (7) months after the Date of Grant, and (B) the date that is three (3) months after the termination of your Continuous Service, and (y) the Expiration Date;

(c) twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 8(d)) below;

(d) eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

(e) the Expiration Date indicated in your Grant Notice; or

(f) the day before the tenth (10^{th}) anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the Date of Grant and ending on the day three (3) months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than three (3) months after the date your employment with the Company or an Affiliate terminates.

9. EXERCISE.

(a) You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

(b) By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

(c) If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within fifteen (15) days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within two (2) years after the Date of Grant or within one (1) year after such shares of Common Stock are transferred upon exercise of your option.

(d) By exercising your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale with respect to any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2711 or NYSE Member Rule 472 or any successor or similar rule~~s~~ or regulation (the "***Lock-Up Period***"); *provided*, *however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period. You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 9(d). The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY. Except as otherwise provided in this Section 10, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

(a) Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

(b) Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement. If this option is an Incentive Stock Option, this option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(c) Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

11. RIGHT OF FIRST REFUSAL. Shares of Common Stock that you acquire upon exercise of your option are subject to any right of first refusal that may be described in the Company's bylaws in effect at such time the Company elects to exercise its right; *provided, however,* that if there is no right of first refusal described in the Company's bylaws at such time, the right of first refusal described below will apply. The Company's right of first refusal will expire on the first date upon which any security of the Company is listed (or approved for listing) upon notice of issuance on a national securities exchange or quotation system (the "***Listing Date***").

(a) Prior to the Listing Date, you may not validly Transfer (as defined below) any shares of Common Stock acquired upon exercise of your option, or any interest in such shares, unless such Transfer is made in compliance with the following provisions:

(i) Before there can be a valid Transfer of any shares of Common Stock or any interest therein, the record holder of the shares of Common Stock to be transferred (the "***Offered Shares***") will give written notice (by registered or certified mail) to the Company. Such notice will specify the identity of the proposed transferee, the cash price offered for the Offered Shares by the proposed transferee (or, if the proposed Transfer is one in which the holder will not receive cash, such as an involuntary transfer, gift, donation or pledge, the holder will state that no purchase price is being proposed), and the other terms and conditions of the proposed Transfer. The date such notice is mailed will be hereinafter referred to as the "***Notice Date***" and the record holder of the Offered Shares will be hereinafter referred to as the "***Offeror***." If, from time to time, there is any stock dividend, stock split or other change in the character or amount of any of the outstanding Common Stock which is subject to the provisions of your option, then in such event any and all new, substituted or additional securities to which you are entitled by reason of your ownership of the shares of Common Stock acquired upon exercise of your option will be immediately subject to the Company's Right of First Refusal (as defined below) with the same force and effect as the shares subject to the Right of First Refusal immediately before such event.

(ii) For a period of thirty (30) calendar days after the Notice Date, or such longer period as may be required to avoid the classification of your option as a liability for financial accounting purposes, the Company will have the option to purchase all (but not less than all) of the Offered Shares at the purchase price and on the terms set forth in Section 11(a)(iii) (the Company's "***Right of First Refusal***"). In the event that the proposed Transfer is one involving no payment of a purchase price, the purchase price will be deemed to be the Fair Market Value of the Offered Shares as determined in good faith by the Board in its discretion. The Company may exercise its Right of First Refusal by mailing (by registered or certified mail)

written notice of exercise of its Right of First Refusal to the Offeror prior to the end of said thirty (30) days (including any extension required to avoid classification of the option as a liability for financial accounting purposes).

(iii) The price at which the Company may purchase the Offered Shares pursuant to the exercise of its Right of First Refusal will be the cash price offered for the Offered Shares by the proposed transferee (as set forth in the notice required under Section 11(a)(i)), or the Fair Market Value as determined by the Board in the event no purchase price is involved. To the extent consideration other than cash is offered by the proposed transferee, the Company will not be required to pay any additional amounts to the Offeror other than the cash price offered (or the Fair Market Value, if applicable). The Company's notice of exercise of its Right of First Refusal will be accompanied by full payment for the Offered Shares and, upon such payment by the Company, the Company will acquire full right, title and interest to all of the Offered Shares.

(iv) If, and only if, the option given pursuant to Section 11(a)(ii) is not exercised, the Transfer proposed in the notice given pursuant to Section 11(a)(i) may take place; *provided, however*, that such Transfer must, in all respects, be exactly as proposed in said notice except that such Transfer may not take place either before the tenth (10th) calendar day after the expiration of the thirty (30) day option exercise period or after the ninetieth (90th) calendar day after the expiration of the thirty (30) day option exercise period, and if such Transfer has not taken place prior to said ninetieth (90th) day, such Transfer may not take place without once again complying with this Section 11(a). The option exercise periods in this Section 11(a)(iv) will be adjusted to include any extension required to avoid the classification of your option as a liability for financial accounting purposes.

(b) As used in this Section 11, the term "***Transfer***" means any sale, encumbrance, pledge, gift or other form of disposition or transfer of shares of Common Stock or any legal or equitable interest therein; *provided, however*, that the term Transfer does not include a transfer of such shares or interests by will or intestacy to your Immediate Family (as defined below). In such case, the transferee or other recipient will receive and hold the shares of Common Stock so transferred subject to the provisions of this Section, and there will be no further transfer of such shares except in accordance with the terms of this Section 11. As used herein, the term "***Immediate Family***" will mean your spouse, the lineal descendant or antecedent, father, mother, brother or sister, child, adopted child, grandchild or adopted grandchild of you or your spouse, or the spouse of any child, adopted child, grandchild or adopted grandchild of you or your spouse.

(c) None of the shares of Common Stock purchased on exercise of your option will be transferred on the Company's books nor will the Company recognize any such Transfer of any such shares or any interest therein unless and until all applicable provisions of this Section 11 have been complied with in all respects. The certificates of stock evidencing shares of Common Stock purchased on exercise of your option will bear an appropriate legend referring to the transfer restrictions imposed by this Section 11.

(d) To ensure that the shares subject to the Company's Right of First Refusal will be available for repurchase by the Company, the Company may require you to deposit the certificates evidencing the shares that you purchase upon exercise of your option with an escrow

agent designated by the Company under the terms and conditions of an escrow agreement approved by the Company. If the Company does not require such deposit as a condition of exercise of your option, the Company reserves the right at any time to require you to so deposit the certificates in escrow. As soon as practicable after the expiration of the Company's Right of First Refusal, the agent will deliver to you the shares and any other property no longer subject to such restriction. In the event the shares and any other property held in escrow are subject to the Company's exercise of its Right of First Refusal, the notices required to be given to you will be given to the escrow agent, and any payment required to be given to you will be given to the escrow agent. Within thirty (30) days after payment by the Company for the Offered Shares, the escrow agent will deliver the Offered Shares that the Company has repurchased to the Company and will deliver the payment received from the Company to you.

12. RIGHT OF REPURCHASE. To the extent provided in the Company's bylaws in effect at such time the Company elects to exercise its right, the Company will have the right to repurchase all or any part of the shares of Common Stock you acquire pursuant to the exercise of your option.

13. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective shareholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

14. WITHHOLDING OBLIGATIONS.

(a) At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "same day sale" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

(b) If this option is a Nonstatutory Stock Option, then upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the minimum amount of tax required to be withheld by law (or such lower amount as may be necessary to avoid classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of

such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

(c) You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

15. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option. Because the Common Stock is not traded on an established securities market, the Fair Market Value is determined by the Board, perhaps in consultation with an independent valuation firm retained by the Company. You acknowledge that there is no guarantee that the Internal Revenue Service will agree with the valuation as determined by the Board, and you will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates in the event that the Internal Revenue Service asserts that the valuation determined by the Board is less than the "fair market value" as subsequently determined by the Internal Revenue Service.

16. AGREEMENT TO EXECUTE OTHER AGREEMENTS. You hereby agree to execute, as and to the extent requested by the Company, a counterpart signature page to that certain Amended and Restated Right of First Refusal and Co-Sale Agreement dated January 27, 2012, by and among the Company and the persons and entities listed on Exhibit A and Exhibit B attached thereto (the "***Co-Sale Agreement***"), and the Amended and Restated Voting Agreement dated January 27, 2012, by and among the Company and the persons and entities listed on Exhibit A and Exhibit B attached thereto (the "***Voting Agreement***"), as each may be amended from time to time. Pursuant to the execution of such counterpart signature page, you will become a "Key Holder" under the Co-Sale Agreement and the Voting Agreement and subject to the terms thereof.

17. NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive

such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

18. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control.

13.

ATTACHMENT III

NOTICE OF EXERCISE

Celladon Corporation
2223 Avenida de la Playa, Suite 205
La Jolla, CA 92037

Date of Exercise: _____

This constitutes notice to Celladon Corporation (the "***Company***") under my stock option that I elect to purchase the below number of shares of Common Stock of the Company (the "***Shares***") for the price set forth below.

Type of option (check one):	Incentive ☐	Nonstatutory ☐
Stock option dated:	_____	_____
Number of Shares as to which option is exercised:	_____	_____
Certificates to be issued in name of:	_____	_____
Total exercise price:	$ _____	$ _____
Cash payment delivered herewith:	$ _____	$ _____
Value of _____ Shares delivered herewith[1]:	$ _____	$ _____
Value of _____ Shares pursuant to net exercise[2]:	$ _____	$ _____
Regulation T Program (cashless exercise[3]):	$ _____	$ _____

1 Shares must meet the public trading requirements set forth in the option. Shares must be valued in accordance with the terms of the option being exercised, and must be owned free and clear of any liens, claims, encumbrances or security interests. Certificates must be endorsed or accompanied by an executed assignment separate from certificate.

2 The option must be a Nonstatutory Stock Option, and Celladon Corporation must have established net exercise procedures at the time of exercise, in order to utilize this payment method.

3 Shares must meet the public trading requirements set forth in the option.

By this exercise, I agree (i) to provide such additional documents as you may require pursuant to the terms of the 2012 Equity Incentive Plan (ii) to provide for the payment by me to you (in the manner designated by you) of your withholding obligation, if any, relating to the exercise of this option, and (iii) if this exercise relates to an incentive stock option, to notify you in writing within fifteen (15) days after the date of any disposition of any of the Shares issued upon exercise of this option that occurs within two (2) years after the date of grant of this option or within one (1) year after such Shares are issued upon exercise of this option.

I hereby make the following certifications and representations with respect to the number of Shares listed above, which are being acquired by me for my own account upon exercise of the option as set forth above:

I acknowledge that the Shares have not been registered under the Securities Act of 1933, as amended (the "***Securities Act***"), and are deemed to constitute "restricted securities" under Rule 701 and Rule 144 promulgated under the Securities Act. I warrant and represent to the Company that I have no present intention of distributing or selling said Shares, except as permitted under the Securities Act and any applicable state securities laws.

I further acknowledge that I will not be able to resell the Shares for at least ninety (90) days after the stock of the Company becomes publicly traded (*i.e.*, subject to the reporting requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934) under Rule 701 and that more restrictive conditions apply to affiliates of the Company under Rule 144.

I further acknowledge that all certificates representing any of the Shares subject to the provisions of the Option shall have endorsed thereon appropriate legends reflecting the foregoing limitations, as well as any legends reflecting restrictions pursuant to the Company's Articles of Incorporation, Bylaws and/or applicable securities laws.

I further agree that, if required by the Company (or a representative of the underwriters) in connection with the first underwritten registration of the offering of any securities of the Company under the Securities Act, I will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale with respect to any shares of Common Stock or other securities of the Company for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act (or such longer period as the underwriters or the Company shall request to facilitate compliance with FINRA Rule 2711 or NYSE Member Rule 472 or any successor or similar rule or regulation) (the "***Lock-Up Period***"). I further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to securities subject to the foregoing restrictions until the end of such period.

Very truly yours,

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CELLADON CORPORATION

2013 EQUITY INCENTIVE PLAN

ADOPTED BY THE BOARD OF DIRECTORS: , 2013
APPROVED BY THE STOCKHOLDERS: , 2013
IPO DATE: , 2013

1. GENERAL.

(a) Successor to and Continuation of Prior Plan. The Plan is intended as the successor to and continuation of the Celladon Corporation 2009 Equity Incentive Plan, as amended (the "***2012 Plan***") and the successor to the Celladon Corporation 2001 Stock Option Plan (the "***2001 Plan***" and, together with the 2012 Plan, the "***Prior Plans***"). From and after 12:01 a.m. Pacific time on the IPO Date, no additional stock awards will be granted under the Prior Plans. All Awards granted on or after 12:01 a.m. Pacific Time on the IPO Date will be granted under this Plan. All stock awards granted under the Prior Plans will remain subject to the terms of the Prior Plans.

(i) Any shares that would otherwise remain available for future grants under the 2012 Plan as of 12:01 a.m. Pacific Time on the IPO Date (the "***2012 Plan's Available Reserve***") will cease to be available under the 2012 Plan at such time. Instead, that number of shares of Common Stock equal to the 2012 Plan's Available Reserve will be added to the Share Reserve (as further described in Section 3(a) below) and will be immediately available for grants and issuance pursuant to Stock Awards hereunder, up to the maximum number set forth in Section 3(a) below.

(ii) In addition, from and after 12:01 a.m. Pacific time on the IPO Date, any shares subject, at such time, to outstanding stock awards granted under the Prior Plans that (i) expire or terminate for any reason prior to exercise or settlement; (ii) are forfeited because of the failure to meet a contingency or condition required to vest such shares or otherwise return to the Company; or (iii) are reacquired, withheld (or not issued) to satisfy a tax withholding obligation in connection with an award or to satisfy the purchase price or exercise price of a stock award (such shares the "***Returning Shares***") will immediately be added to the Share Reserve (as further described in Section 3(a) below) as and when such shares become Returning Shares, up to the maximum number set forth in Section 3(a) below.

(b) Eligible Award Recipients. Employees, Directors and Consultants are eligible to receive Awards.

(c) Available Awards. The Plan provides for the grant of the following Awards: (i) Incentive Stock Options, (ii) Nonstatutory Stock Options, (iii) Stock Appreciation Rights (iv) Restricted Stock Awards, (v) Restricted Stock Unit Awards, (vi) Performance Stock Awards, (vii) Performance Cash Awards, and (viii) Other Stock Awards.

(d) Purpose. The Plan, through the grant of Awards, is intended to help the Company secure and retain the services of eligible award recipients, provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate, and provide a means by which the eligible recipients may benefit from increases in value of the Common Stock.

2. ADMINISTRATION.

(a) Administration by Board. The Board will administer the Plan. The Board may delegate administration of the Plan to a Committee or Committees, as provided in Section 2(c).

(b) Powers of Board. The Board will have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine: (A) who will be granted Awards; (B) when and how each Award will be granted; (C) what type of Award will be granted; (D) the provisions of each Award (which need not be identical), including when a person will be permitted to exercise or otherwise receive cash or Common Stock under the Award; (E) the number of shares of Common Stock subject to, or the cash value of, an Award; and (F) the Fair Market Value applicable to a Stock Award.

(ii) To construe and interpret the Plan and Awards granted under it, and to establish, amend and revoke rules and regulations for administration of the Plan and Awards. The Board, in the exercise of these powers, may correct any defect, omission or inconsistency in the Plan or in any Award Agreement or in the written terms of a Performance Cash Award, in a manner and to the extent it will deem necessary or expedient to make the Plan or Award fully effective.

(iii) To settle all controversies regarding the Plan and Awards granted under it.

(iv) To accelerate, in whole or in part, the time at which an Award may be exercised or vest (or the time at which cash or shares of Common Stock may be issued in settlement thereof).

(v) To suspend or terminate the Plan at any time. Except as otherwise provided in the Plan or an Award Agreement, suspension or termination of the Plan will not materially impair a Participant's rights under the Participant's then-outstanding Award without the Participant's written consent, except as provided in subsection (viii) below.

(vi) To amend the Plan in any respect the Board deems necessary or advisable, including, without limitation, by adopting amendments relating to Incentive Stock Options and certain nonqualified deferred compensation under Section 409A of the Code and/or bringing the Plan or Awards granted under the Plan into compliance with the requirements for Incentive Stock Options or ensuring that they are exempt from, or compliant with, the requirements for nonqualified deferred compensation under Section 409A of the Code, subject to the limitations, if any, of applicable law. If required by applicable law or listing requirements, and except as provided in Section 9(a) relating to Capitalization Adjustments, the Company will seek stockholder approval of any amendment of the Plan that (A) materially increases the number of

shares of Common Stock available for issuance under the Plan, (B) materially expands the class of individuals eligible to receive Awards under the Plan, (C) materially increases the benefits accruing to Participants under the Plan, (D) materially reduces the price at which shares of Common Stock may be issued or purchased under the Plan, (E) materially extends the term of the Plan, or (F) materially expands the types of Awards available for issuance under the Plan. Except as otherwise provided in the Plan or an Award Agreement, no amendment of the Plan will materially impair a Participant's rights under an outstanding Award without the Participant's written consent.

(vii) To submit any amendment to the Plan for stockholder approval, including, but not limited to, amendments to the Plan intended to satisfy the requirements of (A) Section 162(m) of the Code regarding the exclusion of performance-based compensation from the limit on corporate deductibility of compensation paid to Covered Employees, (B) Section 422 of the Code regarding "incentive stock options" or (C) Rule 16b-3.

(viii) To approve forms of Award Agreements for use under the Plan and to amend the terms of any one or more Awards, including, but not limited to, amendments to provide terms more favorable to the Participant than previously provided in the Award Agreement, subject to any specified limits in the Plan that are not subject to Board discretion; *provided, however,* that a Participant's rights under any Award will not be impaired by any such amendment unless (A) the Company requests the consent of the affected Participant, and (B) such Participant consents in writing. Notwithstanding the foregoing, (1) a Participant's rights will not be deemed to have been impaired by any such amendment if the Board, in its sole discretion, determines that the amendment, taken as a whole, does not materially impair the Participant's rights, and (2) subject to the limitations of applicable law, if any, the Board may amend the terms of any one or more Awards without the affected Participant's consent (A) to maintain the qualified status of the Award as an Incentive Stock Option under Section 422 of the Code; (B) to change the terms of an Incentive Stock Option, if such change results in impairment of the Award solely because it impairs the qualified status of the Award as an Incentive Stock Option under Section 422 of the Code; (C) to clarify the manner of exemption from, or to bring the Award into compliance with, Section 409A of the Code; or (D) to comply with other applicable laws or listing requirements.

(ix) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company and that are not in conflict with the provisions of the Plan or Awards.

(x) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees, Directors or Consultants who are foreign nationals or employed outside the United States (provided that Board approval will not be necessary for immaterial modifications to the Plan or any Award Agreement that are required for compliance with the laws of the relevant foreign jurisdiction).

(xi) To effect, with the consent of any adversely affected Participant, (A) the reduction of the exercise, purchase or strike price of any outstanding Stock Award; (B) the cancellation of any outstanding Stock Award and the grant in substitution therefor of a new (1) Option or SAR, (2) Restricted Stock Award, (3) Restricted Stock Unit Award, (4) Other Stock

Award, (5) cash and/or (6) other valuable consideration determined by the Board, in its sole discretion, with any such substituted award (x) covering the same or a different number of shares of Common Stock as the cancelled Stock Award and (y) granted under the Plan or another equity or compensatory plan of the Company; or (C) any other action that is treated as a repricing under generally accepted accounting principles.

(c) Delegation to Committee.

(i) General. The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration of the Plan is delegated to a Committee, the Committee will have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee of the Committee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board will thereafter be to the Committee or subcommittee, as applicable). Any delegation of administrative powers will be reflected in resolutions, not inconsistent with the provisions of the Plan, adopted from time to time by the Board or Committee (as applicable). The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, revest in the Board some or all of the powers previously delegated.

(ii) Section 162(m) and Rule 16b-3 Compliance. The Committee may consist solely of two or more Outside Directors, in accordance with Section 162(m) of the Code, or solely of two or more Non-Employee Directors, in accordance with Rule 16b-3.

(d) Delegation to an Officer. The Board may delegate to one (1) or more Officers the authority to do one or both of the following (i) designate Employees who are not Officers to be recipients of Options and SARs (and, to the extent permitted by applicable law, other Stock Awards) and, to the extent permitted by applicable law, the terms of such Awards, and (ii) determine the number of shares of Common Stock to be subject to such Stock Awards granted to such Employees; *provided, however*, that the Board resolutions regarding such delegation will specify the total number of shares of Common Stock that may be subject to the Stock Awards granted by such Officer and that such Officer may not grant a Stock Award to himself or herself. Any such Stock Awards will be granted on the form of Stock Award Agreement most recently approved for use by the Committee or the Board, unless otherwise provided in the resolutions approving the delegation authority. The Board may not delegate authority to an Officer who is acting solely in the capacity of an Officer (and not also as a Director) to determine the Fair Market Value pursuant to Section 13(w)(iii) below.

(e) Effect of Board's Decision. All determinations, interpretations and constructions made by the Board in good faith will not be subject to review by any person and will be final, binding and conclusive on all persons.

3. SHARES SUBJECT TO THE PLAN.

(a) Share Reserve. Subject to Section 9(a) relating to Capitalization Adjustments, and the following sentence regarding the annual increase, the aggregate number of shares of Common Stock that may be issued pursuant to Stock Awards will not exceed 27,078,125 shares

(the "***Share Reserve***"), which number is the sum of (i) 8,415,000 new shares, *plus* (ii) the number of shares subject to the 2012 Plan's Available Reserve, *plus* (iii) the number of shares that are Returning Shares, as such shares become available from time to time.

In addition, the Share Reserve will automatically increase on January 1st of each year, for a period of not more than ten years from the date the Plan is approved by the stockholders of the Company, commencing on January 1st of the year following the year in which the IPO Date occurs and ending on (and including) January 1, 2023, in an amount equal to 4% of the total number of shares of Capital Stock outstanding on December 31st of the preceding calendar year. Notwithstanding the foregoing, the Board may act prior to January 1st of a given year to provide that there will be no January 1st increase in the Share Reserve for such year or that the increase in the Share Reserve for such year will be a lesser number of shares of Common Stock than would otherwise occur pursuant to the preceding sentence. For clarity, the Share Reserve in this Section 3(a) is a limitation on the number of shares of Common Stock that may be issued pursuant to the Plan. Accordingly, this Section 3(a) does not limit the granting of Stock Awards except as provided in Section 7(a). Shares may be issued in connection with a merger or acquisition as permitted by NASDAQ Listing Rule 5635(c) or, if applicable, NYSE Listed Company Manual Section 303A.08, AMEX Company Guide Section 711 or other applicable rule, and such issuance will not reduce the number of shares available for issuance under the Plan.

(b) Reversion of Shares to the Share Reserve. If a Stock Award or any portion thereof (i) expires or otherwise terminates without all of the shares covered by such Stock Award having been issued or (ii) is settled in cash (*i.e.*, the Participant receives cash rather than stock), such expiration, termination or settlement will not reduce (or otherwise offset) the number of shares of Common Stock that may be available for issuance under the Plan. If any shares of Common Stock issued pursuant to a Stock Award are forfeited back to or repurchased by the Company because of the failure to meet a contingency or condition required to vest such shares in the Participant, then the shares that are forfeited or repurchased will revert to and again become available for issuance under the Plan. Any shares reacquired by the Company in satisfaction of tax withholding obligations on a Stock Award or as consideration for the exercise or purchase price of a Stock Award will again become available for issuance under the Plan.

(c) Incentive Stock Option Limit. Subject to the provisions of Section 9(a) relating to Capitalization Adjustments, the aggregate maximum number of shares of Common Stock that may be issued pursuant to the exercise of Incentive Stock Options will be 54,156,250 shares of Common Stock.

(d) Section 162(m) Limitations. Subject to the provisions of Section 9(a) relating to Capitalization Adjustments, at such time as the Company may be subject to the applicable provisions of Section 162(m) of the Code, the following limitations shall apply.

(i) A maximum of 3,000,000 shares of Common Stock subject to Options, SARs and Other Stock Awards whose value is determined by reference to an increase over an exercise or strike price of at least 100% of the Fair Market Value on the date the Stock Award is granted may be granted to any one Participant during any one calendar year. Notwithstanding the foregoing, if any additional Options, SARs or Other Stock Awards whose value is

determined by reference to an increase over an exercise or strike price of at least 100% of the Fair Market Value on the date the Stock Award are granted to any Participant during any calendar year, compensation attributable to the exercise of such additional Stock Awards will not satisfy the requirements to be considered "qualified performance-based compensation" under Section 162(m) of the Code unless such additional Stock Award is approved by the Company's stockholders.

(ii) A maximum of 3,000,000 shares of Common Stock subject to Performance Stock Awards may be granted to any one Participant during any one calendar year (whether the grant, vesting or exercise is contingent upon the attainment during the Performance Period of the Performance Goals).

(iii) A maximum of $3,000,000 may be granted as a Performance Cash Award to any one Participant during any one calendar year.

(e) Source of Shares. The stock issuable under the Plan will be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the open market or otherwise.

4. ELIGIBILITY.

(a) Eligibility for Specific Stock Awards. Incentive Stock Options may be granted only to employees of the Company or a "parent corporation" or "subsidiary corporation" thereof (as such terms are defined in Sections 424(e) and 424(f) of the Code). Stock Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants; *provided, however*, that Stock Awards may not be granted to Employees, Directors and Consultants who are providing Continuous Service only to any "parent" of the Company, as such term is defined in Rule 405 of the Securities Act, unless (i) the stock underlying such Stock Awards is treated as "service recipient stock" under Section 409A of the Code (for example, because the Stock Awards are granted pursuant to a corporate transaction such as a spin off transaction), (ii) the Company, in consultation with its legal counsel, has determined that such Stock Awards are otherwise exempt from Section 409A of the Code, or (iii) the Company, in consultation with its legal counsel, has determined that such Stock Awards comply with the distribution requirements of Section 409A of the Code.

(b) Ten Percent Stockholders. A Ten Percent Stockholder will not be granted an Incentive Stock Option unless the exercise price of such Option is at least 110% of the Fair Market Value on the date of grant and the Option is not exercisable after the expiration of five years from the date of grant.

5. PROVISIONS RELATING TO OPTIONS AND STOCK APPRECIATION RIGHTS.

Each Option or SAR will be in such form and will contain such terms and conditions as the Board deems appropriate. All Options will be separately designated Incentive Stock Options or Nonstatutory Stock Options at the time of grant, and, if certificates are issued, a separate certificate or certificates will be issued for shares of Common Stock purchased on exercise of each type of Option. If an Option is not specifically designated as an Incentive Stock Option, or if an Option is designated as an Incentive Stock Option but some portion or all of the Option fails

to qualify as an Incentive Stock Option under the applicable rules, then the Option (or portion thereof) will be a Nonstatutory Stock Option. The provisions of separate Options or SARs need not be identical; *provided, however*, that each Award Agreement will conform to (through incorporation of provisions hereof by reference in the applicable Award Agreement or otherwise) the substance of each of the following provisions:

(a) Term. Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, no Option or SAR will be exercisable after the expiration of ten years from the date of its grant or such shorter period specified in the Award Agreement.

(b) Exercise Price. Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, the exercise or strike price of each Option or SAR will be not less than 100% of the Fair Market Value of the Common Stock subject to the Option or SAR on the date the Award is granted. Notwithstanding the foregoing, an Option or SAR may be granted with an exercise or strike price lower than 100% of the Fair Market Value of the Common Stock subject to the Award if such Award is granted pursuant to an assumption of or substitution for another option or stock appreciation right pursuant to a Corporate Transaction and in a manner consistent with the provisions of Section 409A and, if applicable, Section 424(a) of the Code. Each SAR will be denominated in shares of Common Stock equivalents.

(c) Purchase Price for Options. The purchase price of Common Stock acquired pursuant to the exercise of an Option may be paid, to the extent permitted by applicable law and as determined by the Board in its sole discretion, by any combination of the methods of payment set forth below. The Board will have the authority to grant Options that do not permit all of the following methods of payment (or otherwise restrict the ability to use certain methods) and to grant Options that require the consent of the Company to use a particular method of payment. The permitted methods of payment are as follows:

(i) by cash, check, bank draft or money order payable to the Company;

(ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of the stock subject to the Option, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds;

(iii) by delivery to the Company (either by actual delivery or attestation) of shares of Common Stock;

(iv) if an Option is a Nonstatutory Stock Option, by a “net exercise” arrangement pursuant to which the Company will reduce the number of shares of Common Stock issuable upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price; *provided, however*, that the Company will accept a cash or other payment from the Participant to the extent of any remaining balance of the aggregate exercise price not satisfied by such reduction in the number of whole shares to be issued. Shares of Common Stock will no longer be subject to an Option and will not be exercisable thereafter to the extent that (A) shares issuable upon exercise are used to pay the exercise price pursuant to

the “net exercise,” (B) shares are delivered to the Participant as a result of such exercise, and (C) shares are withheld to satisfy tax withholding obligations; or

(v) in any other form of legal consideration that may be acceptable to the Board and specified in the applicable Award Agreement.

(d) Exercise and Payment of a SAR. To exercise any outstanding SAR, the Participant must provide written notice of exercise to the Company in compliance with the provisions of the Stock Appreciation Right Agreement evidencing such SAR. The appreciation distribution payable on the exercise of a SAR will be not greater than an amount equal to the excess of (A) the aggregate Fair Market Value (on the date of the exercise of the SAR) of a number of shares of Common Stock equal to the number of Common Stock equivalents in which the Participant is vested under such SAR, and with respect to which the Participant is exercising the SAR on such date, over (B) the aggregate strike price of the number of Common Stock equivalents with respect to which the Participant is exercising the SAR on such date. The appreciation distribution may be paid in Common Stock, in cash, in any combination of the two or in any other form of consideration, as determined by the Board and contained in the Award Agreement evidencing such SAR.

(e) Transferability of Options and SARs. The Board may, in its sole discretion, impose such limitations on the transferability of Options and SARs as the Board will determine. In the absence of such a determination by the Board to the contrary, the following restrictions on the transferability of Options and SARs will apply:

(i) Restrictions on Transfer. An Option or SAR will not be transferable except by will or by the laws of descent and distribution (or pursuant to subsections (ii) and (iii) below), and will be exercisable during the lifetime of the Participant only by the Participant. The Board may permit transfer of the Option or SAR in a manner that is not prohibited by applicable tax and securities laws. Except as explicitly provided in the Plan, neither an Option nor a SAR may be transferred for consideration.

(ii) Domestic Relations Orders. Subject to the approval of the Board or a duly authorized Officer, an Option or SAR may be transferred pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulations Section 1.421-1(b)(2). If an Option is an Incentive Stock Option, such Option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(iii) Beneficiary Designation. Subject to the approval of the Board or a duly authorized Officer, a Participant may, by delivering written notice to the Company, in a form approved by the Company (or the designated broker), designate a third party who, on the death of the Participant, will thereafter be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, upon the death of the Participant, the executor or administrator of the Participant’s estate will be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. However, the Company may prohibit designation of a

beneficiary at any time, including due to any conclusion by the Company that such designation would be inconsistent with the provisions of applicable laws.

(f) Vesting Generally. The total number of shares of Common Stock subject to an Option or SAR may vest and become exercisable in periodic installments that may or may not be equal. The Option or SAR may be subject to such other terms and conditions on the time or times when it may or may not be exercised (which may be based on the satisfaction of Performance Goals or other criteria) as the Board may deem appropriate. The vesting provisions of individual Options or SARs may vary. The provisions of this Section 5(f) are subject to any Option or SAR provisions governing the minimum number of shares of Common Stock as to which an Option or SAR may be exercised.

(g) Termination of Continuous Service. Except as otherwise provided in the applicable Award Agreement or other agreement between the Participant and the Company, if a Participant's Continuous Service terminates (other than for Cause and other than upon the Participant's death or Disability), the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such Award as of the date of termination of Continuous Service) within the period of time ending on the earlier of (i) the date three months following the termination of the Participant's Continuous Service (or such longer or shorter period specified in the applicable Award Agreement), and (ii) the expiration of the term of the Option or SAR as set forth in the Award Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Option or SAR (as applicable) within the applicable time frame, the Option or SAR will terminate.

(h) Extension of Termination Date. If the exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause and other than upon the Participant's death or Disability) would be prohibited at any time solely because the issuance of shares of Common Stock would violate the registration requirements under the Securities Act, then the Option or SAR will terminate on the earlier of (i) the expiration of a total period of time (that need not be consecutive) equal to the applicable post termination exercise period after the termination of the Participant's Continuous Service during which the exercise of the Option or SAR would not be in violation of such registration requirements, and (ii) the expiration of the term of the Option or SAR as set forth in the applicable Award Agreement. In addition, unless otherwise provided in a Participant's Award Agreement, if the sale of any Common Stock received on exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause) would violate the Company's insider trading policy, then the Option or SAR will terminate on the earlier of (i) the expiration of a period of months (that need not be consecutive) equal to the applicable post-termination exercise period after the termination of the Participant's Continuous Service during which the sale of the Common Stock received upon exercise of the Option or SAR would not be in violation of the Company's insider trading policy, or (ii) the expiration of the term of the Option or SAR as set forth in the applicable Award Agreement.

(i) Disability of Participant. Except as otherwise provided in the applicable Award Agreement or other agreement between the Participant and the Company, if a Participant's Continuous Service terminates as a result of the Participant's Disability, the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such

Option or SAR as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date 12 months following such termination of Continuous Service (or such longer or shorter period specified in the Award Agreement), and (ii) the expiration of the term of the Option or SAR as set forth in the Award Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Option or SAR within the applicable time frame, the Option or SAR (as applicable) will terminate.

(j) Death of Participant. Except as otherwise provided in the applicable Award Agreement or other agreement between the Participant and the Company, if (i) a Participant's Continuous Service terminates as a result of the Participant's death, or (ii) the Participant dies within the period (if any) specified in the Award Agreement for exercisability after the termination of the Participant's Continuous Service for a reason other than death, then the Option or SAR may be exercised (to the extent the Participant was entitled to exercise such Option or SAR as of the date of death) by the Participant's estate, by a person who acquired the right to exercise the Option or SAR by bequest or inheritance or by a person designated to exercise the Option or SAR upon the Participant's death, but only within the period ending on the earlier of (i) the date 18 months following the date of death (or such longer or shorter period specified in the Award Agreement), and (ii) the expiration of the term of such Option or SAR as set forth in the Award Agreement. If, after the Participant's death, the Option or SAR is not exercised within the applicable time frame, the Option or SAR (as applicable) will terminate.

(k) Termination for Cause. Except as explicitly provided otherwise in a Participant's Award Agreement or other individual written agreement between the Company or any Affiliate and the Participant, if a Participant's Continuous Service is terminated for Cause, the Option or SAR will terminate immediately upon such Participant's termination of Continuous Service, and the Participant will be prohibited from exercising his or her Option or SAR from and after the date of such termination of Continuous Service.

(l) Non-Exempt Employees. If an Option or SAR is granted to an Employee who is a non-exempt employee for purposes of the Fair Labor Standards Act of 1938, as amended, the Option or SAR will not be first exercisable for any shares of Common Stock until at least six months following the date of grant of the Option or SAR (although the Award may vest prior to such date). Consistent with the provisions of the Worker Economic Opportunity Act, (i) if such non-exempt Employee dies or suffers a Disability, (ii) upon a Corporate Transaction in which such Option or SAR is not assumed, continued, or substituted, (iii) upon a Change in Control, or (iv) upon the Participant's retirement (as such term may be defined in the Participant's Award Agreement in another agreement between the Participant and the Company, or, if no such definition, in accordance with the Company's then current employment policies and guidelines), the vested portion of any Options and SARs may be exercised earlier than six months following the date of grant. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise or vesting of an Option or SAR will be exempt from his or her regular rate of pay. To the extent permitted and/or required for compliance with the Worker Economic Opportunity Act to ensure that any income derived by a non-exempt employee in connection with the exercise, vesting or issuance of any shares under any other Stock Award will be exempt from the employee's regular rate of pay, the provisions of this Section 5(l) will apply to all Stock Awards and are hereby incorporated by reference into such Stock Award Agreements.

6. PROVISIONS OF STOCK AWARDS OTHER THAN OPTIONS AND SARS.

(a) Restricted Stock Awards. Each Restricted Stock Award Agreement will be in such form and will contain such terms and conditions as the Board will deem appropriate. To the extent consistent with the Company's bylaws, at the Board's election, shares of Common Stock may be (x) held in book entry form subject to the Company's instructions until any restrictions relating to the Restricted Stock Award lapse; or (y) evidenced by a certificate, which certificate will be held in such form and manner as determined by the Board. The terms and conditions of Restricted Stock Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Award Agreements need not be identical. Each Restricted Stock Award Agreement will conform to (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. A Restricted Stock Award may be awarded in consideration for (A) cash, check, bank draft or money order payable to the Company, (B) past services to the Company or an Affiliate, or (C) any other form of legal consideration that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. Shares of Common Stock awarded under the Restricted Stock Award Agreement may be subject to forfeiture to the Company in accordance with a vesting schedule to be determined by the Board.

(iii) Termination of Participant's Continuous Service. If a Participant's Continuous Service terminates, the Company may receive through a forfeiture condition or a repurchase right any or all of the shares of Common Stock held by the Participant that have not vested as of the date of termination of Continuous Service under the terms of the Restricted Stock Award Agreement.

(iv) Transferability. Rights to acquire shares of Common Stock under the Restricted Stock Award Agreement will be transferable by the Participant only upon such terms and conditions as are set forth in the Restricted Stock Award Agreement, as the Board will determine in its sole discretion, so long as Common Stock awarded under the Restricted Stock Award Agreement remains subject to the terms of the Restricted Stock Award Agreement.

(v) Dividends. A Restricted Stock Award Agreement may provide that any dividends paid on Restricted Stock will be subject to the same vesting and forfeiture restrictions as apply to the shares subject to the Restricted Stock Award to which they relate.

(b) Restricted Stock Unit Awards. Each Restricted Stock Unit Award Agreement will be in such form and will contain such terms and conditions as the Board will deem appropriate. The terms and conditions of Restricted Stock Unit Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Unit Award Agreements need not be identical. Each Restricted Stock Unit Award Agreement will conform to (through incorporation of the provisions hereof by reference in the Agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. At the time of grant of a Restricted Stock Unit Award, the Board will determine the consideration, if any, to be paid by the Participant upon delivery of

each share of Common Stock subject to the Restricted Stock Unit Award. The consideration to be paid (if any) by the Participant for each share of Common Stock subject to a Restricted Stock Unit Award may be paid in any form of legal consideration that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. At the time of the grant of a Restricted Stock Unit Award, the Board may impose such restrictions on or conditions to the vesting of the Restricted Stock Unit Award as it, in its sole discretion, deems appropriate.

(iii) Payment. A Restricted Stock Unit Award may be settled by the delivery of shares of Common Stock, their cash equivalent, any combination thereof or in any other form of consideration, as determined by the Board and contained in the Restricted Stock Unit Award Agreement.

(iv) Additional Restrictions. At the time of the grant of a Restricted Stock Unit Award, the Board, as it deems appropriate, may impose such restrictions or conditions that delay the delivery of the shares of Common Stock (or their cash equivalent) subject to a Restricted Stock Unit Award to a time after the vesting of such Restricted Stock Unit Award.

(v) Dividend Equivalents. Dividend equivalents may be credited in respect of shares of Common Stock covered by a Restricted Stock Unit Award, as determined by the Board and contained in the Restricted Stock Unit Award Agreement. At the sole discretion of the Board, such dividend equivalents may be converted into additional shares of Common Stock covered by the Restricted Stock Unit Award in such manner as determined by the Board. Any additional shares covered by the Restricted Stock Unit Award credited by reason of such dividend equivalents will be subject to all of the same terms and conditions of the underlying Restricted Stock Unit Award Agreement to which they relate.

(vi) Termination of Participant's Continuous Service. Except as otherwise provided in the applicable Restricted Stock Unit Award Agreement, such portion of the Restricted Stock Unit Award that has not vested will be forfeited upon the Participant's termination of Continuous Service.

(c) Performance Awards.

(i) Performance Stock Awards. A Performance Stock Award is a Stock Award (covering a number of shares not in excess of that set forth in Section 3(d) above) that is payable (including that may be granted, may vest or may be exercised) contingent upon the attainment during a Performance Period of certain Performance Goals. A Performance Stock Award may, but need not, require the Participant's completion of a specified period of Continuous Service. The length of any Performance Period, the Performance Goals to be achieved during the Performance Period, and the measure of whether and to what degree such Performance Goals have been attained will be conclusively determined by the Committee (or, if not required for compliance with Section 162(m) of the Code, the Board), in its sole discretion. In addition, to the extent permitted by applicable law and the applicable Award Agreement, the Board may determine that cash may be used in payment of Performance Stock Awards.

(ii) Performance Cash Awards. A Performance Cash Award is a cash award (for a dollar value not in excess of that set forth in Section 3(d) above) that is payable contingent upon the attainment during a Performance Period of certain Performance Goals. A Performance Cash Award may also require the completion of a specified period of Continuous Service. At the time of grant of a Performance Cash Award, the length of any Performance Period, the Performance Goals to be achieved during the Performance Period, and the measure of whether and to what degree such Performance Goals have been attained will be conclusively determined by the Committee (or, if not required for compliance with Section 162(m) of the Code, the Board), in its sole discretion. The Board may specify the form of payment of Performance Cash Awards, which may be cash or other property, or may provide for a Participant to have the option for his or her Performance Cash Award, or such portion thereof as the Board may specify, to be paid in whole or in part in cash or other property.

(iii) Board Discretion. The Board retains the discretion to reduce or eliminate the compensation or economic benefit due upon attainment of Performance Goals and to define the manner of calculating the Performance Criteria it selects to use for a Performance Period. Partial achievement of the specified criteria may result in the payment or vesting corresponding to the degree of achievement as specified in the Stock Award Agreement or the written terms of a Performance Cash Award.

(iv) Section 162(m) Compliance. Unless otherwise permitted in compliance with the requirements of Section 162(m) of the Code with respect to an Award intended to qualify as "performance-based compensation" thereunder, the Committee will establish the Performance Goals applicable to, and the formula for calculating the amount payable under, the Award no later than the earlier of (a) the date 90 days after the commencement of the applicable Performance Period, and (b) the date on which 25% of the Performance Period has elapsed, and in any event at a time when the achievement of the applicable Performance Goals remains substantially uncertain. Prior to the payment of any compensation under an Award intended to qualify as "performance-based compensation" under Section 162(m) of the Code, the Committee will certify the extent to which any Performance Goals and any other material terms under such Award have been satisfied (other than in cases where such Performance Goals relate solely to the increase in the value of the Common Stock). Notwithstanding satisfaction of, or completion of any Performance Goals, the number of shares of Common Stock, Options, cash or other benefits granted, issued, retainable and/or vested under an Award on account of satisfaction of such Performance Goals may be reduced by the Committee on the basis of such further considerations as the Committee, in its sole discretion, will determine.

(d) Other Stock Awards. Other forms of Stock Awards valued in whole or in part by reference to, or otherwise based on, Common Stock, including the appreciation in value thereof (e.g., options or stock rights with an exercise price or strike price less than 100% of the Fair Market Value of the Common Stock at the time of grant) may be granted either alone or in addition to Stock Awards provided for under Section 5 and the preceding provisions of this Section 6. Subject to the provisions of the Plan, the Board will have sole and complete authority to determine the persons to whom and the time or times at which such Other Stock Awards will be granted, the number of shares of Common Stock (or the cash equivalent thereof) to be granted pursuant to such Other Stock Awards and all other terms and conditions of such Other Stock Awards.

7. COVENANTS OF THE COMPANY.

(a) Availability of Shares. The Company will keep available at all times the number of shares of Common Stock reasonably required to satisfy then-outstanding Awards.

(b) Securities Law Compliance. The Company will seek to obtain from each regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Stock Awards and to issue and sell shares of Common Stock upon exercise of the Stock Awards; *provided*, *however*, that this undertaking will not require the Company to register under the Securities Act the Plan, any Stock Award or any Common Stock issued or issuable pursuant to any such Stock Award. If, after reasonable efforts and at a reasonable cost, the Company is unable to obtain from any such regulatory commission or agency the authority that counsel for the Company deems necessary for the lawful issuance and sale of Common Stock under the Plan, the Company will be relieved from any liability for failure to issue and sell Common Stock upon exercise of such Stock Awards unless and until such authority is obtained. A Participant will not be eligible for the grant of an Award or the subsequent issuance of cash or Common Stock pursuant to the Award if such grant or issuance would be in violation of any applicable securities law.

(c) No Obligation to Notify or Minimize Taxes. The Company will have no duty or obligation to any Participant to advise such holder as to the time or manner of exercising such Stock Award. Furthermore, the Company will have no duty or obligation to warn or otherwise advise such holder of a pending termination or expiration of an Award or a possible period in which the Award may not be exercised. The Company has no duty or obligation to minimize the tax consequences of an Award to the holder of such Award.

8. MISCELLANEOUS.

(a) Use of Proceeds from Sales of Common Stock. Proceeds from the sale of shares of Common Stock pursuant to Awards will constitute general funds of the Company.

(b) Corporate Action Constituting Grant of Awards. Corporate action constituting a grant by the Company of an Award to any Participant will be deemed completed as of the date of such corporate action, unless otherwise determined by the Board, regardless of when the instrument, certificate, or letter evidencing the Award is communicated to, or actually received or accepted by, the Participant. In the event that the corporate records (e.g., Board consents, resolutions or minutes) documenting the corporate action constituting the grant contain terms (e.g., exercise price, vesting schedule or number of shares) that are inconsistent with those in the Award Agreement or related grant documents as a result of a clerical error in the papering of the Award Agreement or related grant documents, the corporate records will control and the Participant will have no legally binding right to the incorrect term in the Award Agreement or related grant documents.

(c) Stockholder Rights. No Participant will be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares of Common Stock subject to an Award unless and until (i) such Participant has satisfied all requirements for exercise of, or the issuance of shares of Common Stock under, the Award pursuant to its terms, and (ii) the issuance

of the Common Stock subject to such Award has been entered into the books and records of the Company.

(d) No Employment or Other Service Rights. Nothing in the Plan, any Award Agreement or any other instrument executed thereunder or in connection with any Award granted pursuant thereto will confer upon any Participant any right to continue to serve the Company or an Affiliate in the capacity in effect at the time the Award was granted or will affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (iii) the service of a Director pursuant to the bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(e) Change in Time Commitment. In the event a Participant's regular level of time commitment in the performance of his or her services for the Company and any Affiliates is reduced (for example, and without limitation, if the Participant is an Employee of the Company and the Employee has a change in status from a full-time Employee to a part-time Employee or takes an extended leave of absence) after the date of grant of any Award to the Participant, the Board has the right in its sole discretion to (x) make a corresponding reduction in the number of shares or cash amount subject to any portion of such Award that is scheduled to vest or become payable after the date of such change in time commitment, and (y) in lieu of or in combination with such a reduction, extend the vesting or payment schedule applicable to such Award. In the event of any such reduction, the Participant will have no right with respect to any portion of the Award that is so reduced or extended.

(f) Incentive Stock Option Limitations. To the extent that the aggregate Fair Market Value (determined at the time of grant) of Common Stock with respect to which Incentive Stock Options are exercisable for the first time by any Optionholder during any calendar year (under all plans of the Company and any Affiliates) exceeds $100,000 (or such other limit established in the Code) or otherwise does not comply with the rules governing Incentive Stock Options, the Options or portions thereof that exceed such limit (according to the order in which they were granted) or otherwise do not comply with such rules will be treated as Nonstatutory Stock Options, notwithstanding any contrary provision of the applicable Option Agreement(s).

(g) Investment Assurances. The Company may require a Participant, as a condition of exercising or acquiring Common Stock under any Award, (i) to give written assurances satisfactory to the Company as to the Participant's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that such Participant is capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Award; and (ii) to give written assurances satisfactory to the Company stating that the Participant is acquiring Common Stock subject to the Award for the Participant's own account and not with any present intention of selling or otherwise distributing the Common Stock. The foregoing requirements, and any assurances given pursuant to such requirements, will be inoperative if (A) the issuance of the shares upon the exercise or

acquisition of Common Stock under the Award has been registered under a then currently effective registration statement under the Securities Act, or (B) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the Common Stock.

(h) Withholding Obligations. Unless prohibited by the terms of an Award Agreement, the Company may, in its sole discretion, satisfy any federal, state or local tax withholding obligation relating to an Award by any of the following means or by a combination of such means: (i) causing the Participant to tender a cash payment; (ii) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to the Participant in connection with the Award; *provided, however,* that no shares of Common Stock are withheld with a value exceeding the minimum amount of tax required to be withheld by law (or such lesser amount as may be necessary to avoid classification of the Stock Award as a liability for financial accounting purposes); (iii) withholding cash from an Award settled in cash; (iv) withholding payment from any amounts otherwise payable to the Participant; or (v) by such other method as may be set forth in the Award Agreement.

(i) Electronic Delivery. Any reference herein to a "written" agreement or document will include any agreement or document delivered electronically, filed publicly at www.sec.gov (or any successor website thereto) or posted on the Company's intranet (or other shared electronic medium controlled by the Company to which the Participant has access).

(j) Deferrals. To the extent permitted by applicable law, the Board, in its sole discretion, may determine that the delivery of Common Stock or the payment of cash, upon the exercise, vesting or settlement of all or a portion of any Award may be deferred and may establish programs and procedures for deferral elections to be made by Participants. Deferrals by Participants will be made in accordance with Section 409A of the Code. Consistent with Section 409A of the Code, the Board may provide for distributions while a Participant is still an employee or otherwise providing services to the Company. The Board is authorized to make deferrals of Awards and determine when, and in what annual percentages, Participants may receive payments, including lump sum payments, following the Participant's termination of Continuous Service, and implement such other terms and conditions consistent with the provisions of the Plan and in accordance with applicable law.

(k) Compliance with Section 409A of the Code. Unless otherwise expressly provided for in an Award Agreement, the Plan and Award Agreements will be interpreted to the greatest extent possible in a manner that makes the Plan and the Awards granted hereunder exempt from Section 409A of the Code, and, to the extent not so exempt, in compliance with Section 409A of the Code. If the Board determines that any Award granted hereunder is not exempt from and is therefore subject to Section 409A of the Code, the Award Agreement evidencing such Award will incorporate the terms and conditions necessary to avoid the consequences specified in Section 409A(a)(1) of the Code, and to the extent an Award Agreement is silent on terms necessary for compliance, such terms are hereby incorporated by reference into the Award Agreement. Notwithstanding anything to the contrary in this Plan (and

unless the Award Agreement specifically provides otherwise), if the shares of Common Stock are publicly traded, and if a Participant holding an Award that constitutes "deferred compensation" under Section 409A of the Code is a "specified employee" for purposes of Section 409A of the Code, no distribution or payment of any amount that is due because of a "separation from service" (as defined in Section 409A of the Code without regard to alternative definitions thereunder) will be issued or paid before the date that is six months following the date of such Participant's "separation from service" (as defined in Section 409A of the Code without regard to alternative definitions thereunder) or, if earlier, the date of the Participant's death, unless such distribution or payment can be made in a manner that complies with Section 409A of the Code, and any amounts so deferred will be paid in a lump sum on the day after such six month period elapses, with the balance paid thereafter on the original schedule.

(l) Clawback/Recovery. All Awards granted under the Plan will be subject to recoupment in accordance with any clawback policy that the Company is required to adopt pursuant to the listing standards of any national securities exchange or association on which the Company's securities are listed or as is otherwise required by the Dodd-Frank Wall Street Reform and Consumer Protection Act or other applicable law. In addition, the Board may impose such other clawback, recovery or recoupment provisions in an Award Agreement as the Board determines necessary or appropriate, including but not limited to a reacquisition right in respect of previously acquired shares of Common Stock or other cash or property upon the occurrence of an event constituting Cause. No recovery of compensation under such a clawback policy will be an event giving rise to a right to resign for "good reason" or "constructive termination" (or similar term) under any agreement with the Company.

9. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; OTHER CORPORATE EVENTS.

(a) Capitalization Adjustments. In the event of a Capitalization Adjustment, the Board will appropriately and proportionately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of Incentive Stock Options pursuant to Section 3(c), (iii) the class(es) and maximum number of securities that may be awarded to any person pursuant to Sections 3(d), and (iv) the class(es) and number of securities and price per share of stock subject to outstanding Stock Awards. The Board will make such adjustments, and its determination will be final, binding and conclusive.

(b) Dissolution or Liquidation. Except as otherwise provided in the Stock Award Agreement, in the event of a dissolution or liquidation of the Company, all outstanding Stock Awards (other than Stock Awards consisting of vested and outstanding shares of Common Stock not subject to a forfeiture condition or the Company's right of repurchase) will terminate immediately prior to the completion of such dissolution or liquidation, and the shares of Common Stock subject to the Company's repurchase rights or subject to a forfeiture condition may be repurchased or reacquired by the Company notwithstanding the fact that the holder of such Stock Award is providing Continuous Service; *provided*, *however*, that the Board may, in its sole discretion, cause some or all Stock Awards to become fully vested, exercisable and/or no longer subject to repurchase or forfeiture (to the extent such Stock Awards have not previously expired or terminated) before the dissolution or liquidation is completed but contingent on its completion.

(c) Corporate Transaction. The following provisions will apply to Stock Awards in the event of a Corporate Transaction unless otherwise provided in the instrument evidencing the Stock Award or any other written agreement between the Company or any Affiliate and the Participant or unless otherwise expressly provided by the Board at the time of grant of a Stock Award. In the event of a Corporate Transaction, then, notwithstanding any other provision of the Plan, the Board will take one or more of the following actions with respect to Stock Awards, contingent upon the closing or completion of the Corporate Transaction:

(i) arrange for the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) to assume or continue the Stock Award or to substitute a similar stock award for the Stock Award (including, but not limited to, an award to acquire the same consideration paid to the stockholders of the Company pursuant to the Corporate Transaction);

(ii) arrange for the assignment of any reacquisition or repurchase rights held by the Company in respect of Common Stock issued pursuant to the Stock Award to the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company);

(iii) accelerate the vesting, in whole or in part, of the Stock Award (and, if applicable, the time at which the Stock Award may be exercised) to a date prior to the effective time of such Corporate Transaction as the Board will determine (or, if the Board will not determine such a date, to the date that is five days prior to the effective date of the Corporate Transaction), with such Stock Award terminating if not exercised (if applicable) at or prior to the effective time of the Corporate Transaction;

(iv) arrange for the lapse, in whole or in part, of any reacquisition or repurchase rights held by the Company with respect to the Stock Award;

(v) cancel or arrange for the cancellation of the Stock Award, to the extent not vested or not exercised prior to the effective time of the Corporate Transaction, in exchange for such cash consideration, if any, as the Board, in its sole discretion, may consider appropriate; and

(vi) make a payment, in such form as may be determined by the Board equal to the excess, if any, of (A) the value of the property the Participant would have received upon the exercise of the Stock Award immediately prior to the effective time of the Corporate Transaction, over (B) any exercise price payable by such holder in connection with such exercise.

The Board need not take the same action or actions with respect to all Stock Awards or portions thereof or with respect to all Participants. The Board may take different actions with respect to the vested and unvested portions of a Stock Award.

(d) Change in Control. A Stock Award may be subject to additional acceleration of vesting and exercisability upon or after a Change in Control as may be provided in the Stock Award Agreement for such Stock Award or as may be provided in any other written agreement between the Company or any Affiliate and the Participant, but in the absence of such provision, no such acceleration will occur.

10. PLAN TERM; EARLIER TERMINATION OR SUSPENSION OF THE PLAN.

The Board may suspend or terminate the Plan at any time. No Incentive Stock Options may be granted after the tenth anniversary of the earlier of (i) the date the Plan is adopted by the Board (the "***Adoption Date***"), or (ii) the date the Plan is approved by the stockholders of the Company. No Awards may be granted under the Plan while the Plan is suspended or after it is terminated.

11. EXISTENCE OF THE PLAN; TIMING OF FIRST GRANT OR EXERCISE.

The Plan will come into existence on the Adoption Date; *provided, however*, that no Award may be granted prior to the IPO Date. In addition, no Stock Award will be exercised (or, in the case of a Restricted Stock Award, Restricted Stock Unit Award, Performance Stock Award, or Other Stock Award, no Stock Award will be granted) and no Performance Cash Award will be settled unless and until the Plan has been approved by the stockholders of the Company, which approval will be within 12 months after the date the Plan is adopted by the Board.

12. CHOICE OF LAW.

The law of the State of California will govern all questions concerning the construction, validity and interpretation of this Plan, without regard to that state's conflict of laws rules.

13. DEFINITIONS. As used in the Plan, the following definitions will apply to the capitalized terms indicated below:

(a) "***Affiliate***" means, at the time of determination, any "parent" or "subsidiary" of the Company as such terms are defined in Rule 405 of the Securities Act. The Board will have the authority to determine the time or times at which "parent" or "subsidiary" status is determined within the foregoing definition.

(b) "***Award***" means a Stock Award or a Performance Cash Award.

(c) "***Award Agreement***" means a written agreement between the Company and a Participant evidencing the terms and conditions of an Award.

(d) "***Board***" means the Board of Directors of the Company.

(e) "***Capital Stock***" means each and every class of common stock of the Company, regardless of the number of votes per share.

(f) "***Capitalization Adjustment***" means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Stock Award after the Adoption Date without the receipt of consideration by the Company through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, large nonrecurring cash dividend, stock split, reverse stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or any similar equity restructuring transaction, as that term is used in Statement of Financial

Accounting Standards Board Accounting Standards Codification Topic 718 (or any successor thereto). Notwithstanding the foregoing, the conversion of any convertible securities of the Company will not be treated as a Capitalization Adjustment.

(g) "***Cause***" will have the meaning ascribed to such term in any written agreement between the Participant and the Company defining such term and, in the absence of such agreement, such term means, with respect to a Participant, the occurrence of any of the following events: (i) such Participant's commission of any felony or any crime involving fraud, dishonesty or moral turpitude under the laws of the United States or any state thereof; (ii) such Participant's attempted commission of, or participation in, a fraud or act of dishonesty against the Company; (iii) such Participant's intentional, material violation of any contract or agreement between the Participant and the Company or of any statutory duty owed to the Company; (iv) such Participant's unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) such Participant's gross misconduct. The determination that a termination of the Participant's Continuous Service is either for Cause or without Cause will be made by the Company, in its sole discretion. Any determination by the Company that the Continuous Service of a Participant was terminated with or without Cause for the purposes of outstanding Awards held by such Participant will have no effect upon any determination of the rights or obligations of the Company or such Participant for any other purpose.

(h) "***Change in Control***" means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) any Exchange Act Person becomes the Owner, directly or indirectly, of securities of the Company representing more than 50% of the combined voting power of the Company's then outstanding securities other than by virtue of a merger, consolidation or similar transaction. Notwithstanding the foregoing, a Change in Control will not be deemed to occur (A) on account of the acquisition of securities of the Company directly from the Company, (B) on account of the acquisition of securities of the Company by an investor, any affiliate thereof or any other Exchange Act Person that acquires the Company's securities in a transaction or series of related transactions the primary purpose of which is to obtain financing for the Company through the issuance of equity securities, (C) on account of the acquisition of securities of the Company by any individual who is, on the IPO Date, either an executive officer or a Director (either, an "***IPO Investor***") and/or any entity in which an IPO Investor has a direct or indirect interest (whether in the form of voting rights or participation in profits or capital contributions) of more than 50% (collectively, the "***IPO Entities***") or on account of the IPO Entities continuing to hold shares that come to represent more than 50% of the combined voting power of the Company's then outstanding securities as a result of the conversion of any class of the Company's securities into another class of the Company's securities having a different number of votes per share pursuant to the conversion provisions set forth in the Company's Amended and Restated Certificate of Incorporation; or (D) solely because the level of Ownership held by any Exchange Act Person (the "***Subject Person***") exceeds the designated percentage threshold of the outstanding voting securities as a result of a repurchase or other acquisition of voting securities by the Company reducing the number of shares outstanding, provided that if a Change in Control would occur (but for the operation of this sentence) as a result of the acquisition of voting securities by the Company, and after such share acquisition, the Subject Person becomes the Owner of any additional voting securities that, assuming the repurchase or other acquisition

had not occurred, increases the percentage of the then outstanding voting securities Owned by the Subject Person over the designated percentage threshold, then a Change in Control will be deemed to occur;

(ii) there is consummated a merger, consolidation or similar transaction involving (directly or indirectly) the Company and, immediately after the consummation of such merger, consolidation or similar transaction, the stockholders of the Company immediately prior thereto do not Own, directly or indirectly, either (A) outstanding voting securities representing more than 50% of the combined outstanding voting power of the surviving Entity in such merger, consolidation or similar transaction or (B) more than 50% of the combined outstanding voting power of the parent of the surviving Entity in such merger, consolidation or similar transaction, in each case in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such transaction; *provided*, *however*, that a merger, consolidation or similar transaction will not constitute a Change in Control under this prong of the definition if the outstanding voting securities representing more than 50% of the combined voting power of the surviving Entity or its parent are owned by the IPO Entities;

(iii) there is consummated a sale, lease, exclusive license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries, other than a sale, lease, license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries to an Entity, more than 50% of the combined voting power of the voting securities of which are Owned by stockholders of the Company in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such sale, lease, license or other disposition; *provided*, *however*, that a sale, lease, exclusive license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries will not constitute a Change in Control under this prong of the definition if the outstanding voting securities representing more than 50% of the combined voting power of the acquiring Entity or its parent are owned by the IPO Entities; or

(iv) the stockholders of the Company approve or the Board approves a plan of complete dissolution or liquidation of the Company, or a complete dissolution or liquidation of the Company will otherwise occur, except for a liquidation into a parent corporation.

Notwithstanding the foregoing definition or any other provision of the Plan, the term Change in Control will not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company and the definition of Change in Control (or any analogous term) in an individual written agreement between the Company or any Affiliate and the Participant will supersede the foregoing definition with respect to Awards subject to such agreement; *provided*, *however*, that if no definition of Change in Control or any analogous term is set forth in such an individual written agreement, the foregoing definition will apply.

(i) "***Code***" means the Internal Revenue Code of 1986, as amended, including any applicable regulations and guidance thereunder.

(j) "***Committee***" means a committee of one or more Directors to whom authority has been delegated by the Board in accordance with Section 2(c).

(k) "***Common Stock***" means, as of the IPO Date, the common stock of the Company, having one vote per share.

(l) "***Company***" means Celladon Corporation, a Delaware corporation.

(m) "***Consultant***" means any person, including an advisor, who is (i) engaged by the Company or an Affiliate to render consulting or advisory services and is compensated for such services, or (ii) serving as a member of the board of directors of an Affiliate and is compensated for such services. However, service solely as a Director, or payment of a fee for such service, will not cause a Director to be considered a "Consultant" for purposes of the Plan. Notwithstanding the foregoing, a person is treated as a Consultant under this Plan only if a Form S-8 Registration Statement under the Securities Act is available to register either the offer or the sale of the Company's securities to such person.

(n) "***Continuous Service***" means that the Participant's service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. A change in the capacity in which the Participant renders service to the Company or an Affiliate as an Employee, Consultant or Director or a change in the entity for which the Participant renders such service, provided that there is no interruption or termination of the Participant's service with the Company or an Affiliate, will not terminate a Participant's Continuous Service; *provided, however*, that if the Entity for which a Participant is rendering services ceases to qualify as an Affiliate, as determined by the Board, in its sole discretion, such Participant's Continuous Service will be considered to have terminated on the date such Entity ceases to qualify as an Affiliate. To the extent permitted by law, the Board or the chief executive officer of the Company, in that party's sole discretion, may determine whether Continuous Service will be considered interrupted in the case of (i) any leave of absence approved by the Board or chief executive officer, including sick leave, military leave or any other personal leave, or (ii) transfers between the Company, an Affiliate, or their successors. Notwithstanding the foregoing, a leave of absence will be treated as Continuous Service for purposes of vesting in an Award only to such extent as may be provided in the Company's leave of absence policy, in the written terms of any leave of absence agreement or policy applicable to the Participant, or as otherwise required by law.

(o) "***Corporate Transaction***" means the consummation, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) a sale or other disposition of all or substantially all, as determined by the Board, in its sole discretion, of the consolidated assets of the Company and its Subsidiaries;

(ii) a sale or other disposition of at least 90% of the outstanding securities of the Company;

(iii) a merger, consolidation or similar transaction following which the Company is not the surviving corporation; or

(iv) a merger, consolidation or similar transaction following which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted or exchanged by virtue of the merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

(p) "***Covered Employee***" will have the meaning provided in Section 162(m)(3) of the Code.

(q) "***Director***" means a member of the Board.

(r) "***Disability***" means, with respect to a Participant, the inability of such Participant to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than 12 months, as provided in Sections 22(e)(3) and 409A(a)(2)(c)(i) of the Code, and will be determined by the Board on the basis of such medical evidence as the Board deems warranted under the circumstances.

(s) "***Employee***" means any person employed by the Company or an Affiliate. However, service solely as a Director, or payment of a fee for such services, will not cause a Director to be considered an "Employee" for purposes of the Plan.

(t) "***Entity***" means a corporation, partnership, limited liability company or other entity.

(u) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

(v) "***Exchange Act Person***" means any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act), except that "Exchange Act Person" will not include (i) the Company or any Subsidiary of the Company, (ii) any employee benefit plan of the Company or any Subsidiary of the Company or any trustee or other fiduciary holding securities under an employee benefit plan of the Company or any Subsidiary of the Company, (iii) an underwriter temporarily holding securities pursuant to a registered public offering of such securities, (iv) an Entity Owned, directly or indirectly, by the stockholders of the Company in substantially the same proportions as their Ownership of stock of the Company; or (v) any natural person, Entity or "group" (within the meaning of Section 13(d) or 14(d) of the Exchange Act) that, as of the IPO Date, is the Owner, directly or indirectly, of securities of the Company representing more than 50% of the combined voting power of the Company's then outstanding securities.

(w) "***Fair Market Value***" means, as of any date, the value of the Common Stock determined as follows:

(i) If the Common Stock is listed on any established stock exchange or traded on any established market, the Fair Market Value of a share of Common Stock will be, unless otherwise determined by the Board, the closing sales price for such stock as quoted on such

exchange or market (or the exchange or market with the greatest volume of trading in the Common Stock) on the date of determination, as reported in a source the Board deems reliable.

(ii) Unless otherwise provided by the Board, if there is no closing sales price for the Common Stock on the date of determination, then the Fair Market Value will be the closing selling price on the last preceding date for which such quotation exists.

(iii) In the absence of such markets for the Common Stock, the Fair Market Value will be determined by the Board in good faith and in a manner that complies with Sections 409A and 422 of the Code.

(x) "***Incentive Stock Option***" means an option granted pursuant to Section 5 of the Plan that is intended to be, and qualifies as, an "incentive stock option" within the meaning of Section 422 of the Code.

(y) "***IPO Date***" means the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Common Stock, pursuant to which the Common Stock is priced for the initial public offering.

(z) "***Non-Employee Director***" means a Director who either (i) is not a current employee or officer of the Company or an Affiliate, does not receive compensation, either directly or indirectly, from the Company or an Affiliate for services rendered as a consultant or in any capacity other than as a Director (except for an amount as to which disclosure would not be required under Item 404(a) of Regulation S-K promulgated pursuant to the Securities Act ("***Regulation S-K***")), does not possess an interest in any other transaction for which disclosure would be required under Item 404(a) of Regulation S-K, and is not engaged in a business relationship for which disclosure would be required pursuant to Item 404(b) of Regulation S-K; or (ii) is otherwise considered a "non-employee director" for purposes of Rule 16b-3.

(aa) "***Nonstatutory Stock Option***" means any Option granted pursuant to Section 5 of the Plan that does not qualify as an Incentive Stock Option.

(bb) "***Officer***" means a person who is an officer of the Company within the meaning of Section 16 of the Exchange Act.

(cc) "***Option***" means an Incentive Stock Option or a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(dd) "***Option Agreement***" means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an Option grant. Each Option Agreement will be subject to the terms and conditions of the Plan.

(ee) "***Optionholder***" means a person to whom an Option is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Option.

(ff) "***Other Stock Award***" means an award based in whole or in part by reference to the Common Stock which is granted pursuant to the terms and conditions of Section 6(d).

(gg) "***Other Stock Award Agreement***" means a written agreement between the Company and a holder of an Other Stock Award evidencing the terms and conditions of an Other Stock Award grant. Each Other Stock Award Agreement will be subject to the terms and conditions of the Plan.

(hh) "***Outside Director***" means a Director who either (i) is not a current employee of the Company or an "affiliated corporation" (within the meaning of Treasury Regulations promulgated under Section 162(m) of the Code), is not a former employee of the Company or an "affiliated corporation" who receives compensation for prior services (other than benefits under a tax-qualified retirement plan) during the taxable year, has not been an officer of the Company or an "affiliated corporation," and does not receive remuneration from the Company or an "affiliated corporation," either directly or indirectly, in any capacity other than as a Director, or (ii) is otherwise considered an "outside director" for purposes of Section 162(m) of the Code.

(ii) "***Own,***" "***Owned,***" "***Owner,***" "***Ownership***" means a person or Entity will be deemed to "Own," to have "Owned," to be the "Owner" of, or to have acquired "Ownership" of securities if such person or Entity, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares voting power, which includes the power to vote or to direct the voting, with respect to such securities.

(jj) "***Participant***" means a person to whom an Award is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Stock Award.

(kk) "***Performance Cash Award***" means an award of cash granted pursuant to the terms and conditions of Section 6(c)(ii).

(ll) "***Performance Criteria***" means the one or more criteria that the Board will select for purposes of establishing the Performance Goals for a Performance Period. The Performance Criteria that will be used to establish such Performance Goals may be based on any one of, or combination of, the following as determined by the Board: (i) earnings (including earnings per share and net earnings); (ii) earnings before interest, taxes and depreciation; (iii) earnings before interest, taxes, depreciation and amortization; (iv) earnings before interest, taxes, depreciation, amortization and legal settlements; (v) earnings before interest, taxes, depreciation, amortization, legal settlements and other income (expense); (vi) earnings before interest, taxes, depreciation, amortization, legal settlements, other income (expense) and stock-based compensation; (vii) earnings before interest, taxes, depreciation, amortization, legal settlements, other income (expense), stock-based compensation and changes in deferred revenue; (viii) total stockholder return; (ix) return on equity or average stockholder's equity; (x) return on assets, investment, or capital employed; (xi) stock price; (xii) margin (including gross margin); (xiii) income (before or after taxes); (xiv) operating income; (xv) operating income after taxes; (xvi) pre-tax profit; (xvii) operating cash flow; (xviii) sales or revenue targets; (xix) increases in revenue or product revenue; (xx) expenses and cost reduction goals; (xxi) improvement in or attainment of working capital levels; (xxii) economic value added (or an equivalent metric); (xxiii) market share; (xxiv) cash flow; (xxv) cash flow per share; (xxvi) share price performance; (xxvii) debt reduction; (xxviii) implementation or completion of projects or processes (including, without limitation, clinical trial initiation, clinical trial enrollment, clinical trial results, new and supplemental indications for existing products, regulatory filing submissions, regulatory filing acceptances,

regulatory or advisory committee interactions, regulatory approvals, and product supply); (xxix) stockholders' equity; (xxx) capital expenditures; (xxxi) debt levels; (xxxii) operating profit or net operating profit; (xxxiii) workforce diversity; (xxxiv) growth of net income or operating income; (xxxv) billings; (xxxvi) bookings; (xxxvii) employee retention; (xxxviii) initiation of phases of clinical trials and/or studies by specific dates; (xxxix) patient enrollment rates; (xl) budget management; (xli) submission to, or approval by, a regulatory body (including, but not limited to the U.S. Food and Drug Administration) of an applicable filing or a product candidate; (xlii) regulatory milestones; (xliii) progress of internal research or clinical programs; (xliv) progress of partnered programs; (xlv) partner satisfaction; (xlvi) timely completion of clinical trials; (xlvii) submission of INDs and NDAs and other regulatory achievements; (xlviii) research progress, including the development of programs; (xlix) strategic partnerships or transactions (including in-licensing and out-licensing of intellectual property; and (l) and to the extent that an Award is not intended to comply with Section 162(m) of the Code, other measures of performance selected by the Board.

(mm) "***Performance Goals***" means, for a Performance Period, the one or more goals established by the Board for the Performance Period based upon the Performance Criteria. Performance Goals may be based on a Company-wide basis, with respect to one or more business units, divisions, Affiliates, or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. Unless specified otherwise by the Board (i) in the Award Agreement at the time the Award is granted or (ii) in such other document setting forth the Performance Goals at the time the Performance Goals are established, the Board will appropriately make adjustments in the method of calculating the attainment of Performance Goals for a Performance Period as follows: (1) to exclude restructuring and/or other nonrecurring charges; (2) to exclude exchange rate effects; (3) to exclude the effects of changes to generally accepted accounting principles; (4) to exclude the effects of any statutory adjustments to corporate tax rates; (5) to exclude the effects of any "extraordinary items" as determined under generally accepted accounting principles; (6) to exclude the dilutive effects of acquisitions or joint ventures; (7) to assume that any business divested by the Company achieved performance objectives at targeted levels during the balance of a Performance Period following such divestiture; (8) to exclude the effect of any change in the outstanding shares of common stock of the Company by reason of any stock dividend or split, stock repurchase, reorganization, recapitalization, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to common stockholders other than regular cash dividends; (9) to exclude the effects of stock based compensation and the award of bonuses under the Company's bonus plans; (10) to exclude costs incurred in connection with potential acquisitions or divestitures that are required to be expensed under generally accepted accounting principles; (11) to exclude the goodwill and intangible asset impairment charges that are required to be recorded under generally accepted accounting principles; (12) to exclude the effect of any other unusual, non-recurring gain or loss or other extraordinary item; and (13) to exclude the effects of the timing of acceptance for review and/or approval of submissions to the U.S. Food and Drug Administration or any other regulatory body. In addition, the Board retains the discretion to reduce or eliminate the compensation or economic benefit due upon attainment of Performance Goals and to define the manner of calculating the Performance Criteria it selects to use for such Performance Period. Partial achievement of the specified criteria may result in the payment or vesting corresponding to the degree of

achievement as specified in the Stock Award Agreement or the written terms of a Performance Cash Award.

(nn) "***Performance Period***" means the period of time selected by the Board over which the attainment of one or more Performance Goals will be measured for the purpose of determining a Participant's right to and the payment of a Stock Award or a Performance Cash Award. Performance Periods may be of varying and overlapping duration, at the sole discretion of the Board.

(oo) "***Performance Stock Award***" means a Stock Award granted under the terms and conditions of Section 6(c)(i).

(pp) "***Plan***" means this Celladon Corporation 2013 Equity Incentive Plan.

(qq) "***Restricted Stock Award***" means an award of shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(a).

(rr) "***Restricted Stock Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Award evidencing the terms and conditions of a Restricted Stock Award grant. Each Restricted Stock Award Agreement will be subject to the terms and conditions of the Plan.

(ss) "***Restricted Stock Unit Award***" means a right to receive shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(b).

(tt) "***Restricted Stock Unit Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Unit Award evidencing the terms and conditions of a Restricted Stock Unit Award grant. Each Restricted Stock Unit Award Agreement will be subject to the terms and conditions of the Plan.

(uu) "***Rule 16b-3***" means Rule 16b-3 promulgated under the Exchange Act or any successor to Rule 16b-3, as in effect from time to time.

(vv) "***Securities Act***" means the Securities Act of 1933, as amended.

(ww) "***Stock Appreciation Right***" or "***SAR***" means a right to receive the appreciation on Common Stock that is granted pursuant to the terms and conditions of Section 5.

(xx) "***Stock Appreciation Right Agreement***" means a written agreement between the Company and a holder of a Stock Appreciation Right evidencing the terms and conditions of a Stock Appreciation Right grant. Each Stock Appreciation Right Agreement will be subject to the terms and conditions of the Plan.

(yy) "***Stock Award***" means any right to receive Common Stock granted under the Plan, including an Incentive Stock Option, a Nonstatutory Stock Option, a Restricted Stock Award, a Restricted Stock Unit Award, a Stock Appreciation Right, a Performance Stock Award or any Other Stock Award.

(zz) "***Stock Award Agreement***" means a written agreement between the Company and a Participant evidencing the terms and conditions of a Stock Award grant. Each Stock Award Agreement will be subject to the terms and conditions of the Plan.

(aaa) "***Subsidiary***" means, with respect to the Company, (i) any corporation of which more than 50% of the outstanding capital stock having ordinary voting power to elect a majority of the board of directors of such corporation (irrespective of whether, at the time, stock of any other class or classes of such corporation will have or might have voting power by reason of the happening of any contingency) is at the time, directly or indirectly, Owned by the Company, and (ii) any partnership, limited liability company or other entity in which the Company has a direct or indirect interest (whether in the form of voting or participation in profits or capital contribution) of more than 50%.

(bbb) "***Ten Percent Stockholder***" means a person who Owns (or is deemed to Own pursuant to Section 424(d) of the Code) stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or any Affiliate.

CELLADON CORPORATION
STOCK OPTION GRANT NOTICE
(2013 EQUITY INCENTIVE PLAN)

Celladon Corporation (the "***Company***"), pursuant to its 2013 Equity Incentive Plan (the "***Plan***"), hereby grants to Optionholder an option to purchase the number of shares of the Company's Common Stock set forth below. This option is subject to all of the terms and conditions as set forth in this notice, in the Option Agreement, the Plan and the Notice of Exercise, all of which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Option Agreement will have the same definitions as in the Plan or the Option Agreement. If there is any conflict between the terms in this notice and the Plan, the terms of the Plan will control.

Optionholder:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Shares Subject to Option:	_____
Exercise Price (Per Share):	_____
Total Exercise Price:	_____
Expiration Date:	_____

Type of Grant: ☐ Incentive Stock Option[1] ☐ Nonstatutory Stock Option

Exercise Schedule: ☒ Same as Vesting Schedule ☐ Early Exercise Permitted

Vesting Schedule: **[**One-fourth **(**1/4th) of the shares vest one year after the Vesting Commencement Date; the balance of the shares vest in a series of thirty-six (36) successive equal monthly installments measured from the first anniversary of the Vesting Commencement Date, subject to Optionholder's Continuous Service as of each such date.]

Payment: By one or a combination of the following items (described in the Option Agreement):

☒ By cash, check, bank draft or money order payable to the Company
☒ Pursuant to a Regulation T Program if the shares are publicly traded
☒ By delivery of already-owned shares if the shares are publicly traded
☒ If and only to the extent this option is a Nonstatutory Stock Option, and subject to the Company's consent at the time of exercise, by a "net exercise" arrangement

1 If this is an Incentive Stock Option, it (plus other outstanding Incentive Stock Options) cannot be first *exercisable* for more than $100,000 in value (measured by exercise price) in any calendar year. Any excess over $100,000 is a Nonstatutory Stock Option.

Additional Terms/Acknowledgements: Optionholder acknowledges receipt of, and understands and agrees to, this Stock Option Grant Notice, the Option Agreement and the Plan. Optionholder acknowledges and agrees that this Stock Option Grant Notice and the Option Agreement may not be modified, amended or revised except as provided in the Plan. Optionholder further acknowledges that as of the Date of Grant, this Stock Option Grant Notice, the Option Agreement, and the Plan set forth the entire understanding between Optionholder and the Company regarding this option award and supersede all prior oral and written agreements, promises and/or representations on that subject with the exception of (i) options previously granted and delivered to Optionholder, (ii) any compensation recovery policy that is adopted by the Company or is otherwise required by applicable law and (iii) any written employment or severance arrangement that would provide for vesting acceleration of this option upon the terms and conditions set forth therein. By accepting this option, Optionholder consents to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

CELLADON CORPORATION	**OPTIONHOLDER:**
By: _____	_____
Signature	Signature
Title: _____	Date: _____
Date: _____	

ATTACHMENTS: Option Agreement, 2013 Equity Incentive Plan and Notice of Exercise

ATTACHMENT I

OPTION AGREEMENT

ATTACHMENT II

2013 EQUITY INCENTIVE PLAN

ATTACHMENT III

NOTICE OF EXERCISE

CELLADON CORPORATION
2013 EQUITY INCENTIVE PLAN

OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Celladon Corporation (the "***Company***") has granted you an option under its 2013 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

1. VESTING. Subject to the provisions contained herein, your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. If you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (that is, a "***Non-Exempt Employee***"), and except as otherwise provided in the Plan, you may not exercise your option until you have completed at least six (6) months of Continuous Service measured from the Date of Grant, even if you have already been an employee for more than six (6) months. Consistent with the provisions of the Worker Economic Opportunity Act, you may exercise your option as to any vested portion prior to such six (6) month anniversary in the case of (i) your death or disability, (ii) a Corporate Transaction in which your option is not assumed, continued or substituted, (iii) a Change in Control or (iv) your termination of Continuous Service on your "retirement" (as defined in the Company's benefit plans).

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates "Early Exercise Permitted") and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the unvested portion of your option; *provided, however,* that:

(a) a partial exercise of your option will be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

(b) any shares of Common Stock so purchased from installments that have not vested as of the date of exercise will be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

(c) you will enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

(d) if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the Date of Grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds one hundred thousand dollars ($100,000), your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) will be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

(a) Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

(b) Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

(c) If this option is a Nonstatutory Stock Option, subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii)

are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

8. TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

(a) immediately upon the termination of your Continuous Service for Cause;

(b) three (3) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 8(d) below); *provided*, *however*, that if during any part of such three (3) month period your option is not exercisable solely because of the condition set forth in the section above relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service; *provided further*, if during any part of such three (3) month period, the sale of any Common Stock received upon exercise of your option would violate the Company's insider trading policy, then your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service during which the sale of the Common Stock received upon exercise of your option would not be in violation of the Company's insider trading policy. Notwithstanding the foregoing, if (i) you are a Non-Exempt Employee, (ii) your Continuous Service terminates within six (6) months after the Date of Grant, and (iii) you have vested in a portion of your option at the time of your termination of Continuous Service, your option will not expire until the earlier of (x) the later of (A) the date that is seven (7) months after the Date of Grant, and (B) the date that is three (3) months after the termination of your Continuous Service, and (y) the Expiration Date;

(c) twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 8(d)) below;

(d) eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

(e) the Expiration Date indicated in your Grant Notice; or

(f) the day before the tenth (10th) anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the Date of Grant and ending on the day three (3) months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than three (3) months after the date your employment with the Company or an Affiliate terminates.

9. EXERCISE.

(a) You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

(b) By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

(c) If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within fifteen (15) days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within two (2) years after the Date of Grant or within one (1) year after such shares of Common Stock are transferred upon exercise of your option.

(d) By accepting your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2711 or NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided, however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing

or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period. You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 9(d). The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY. Except as otherwise provided in this Section 10, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

(a) Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

(b) Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement. If this option is an Incentive Stock Option, this option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(c) Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

11. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

12. WITHHOLDING OBLIGATIONS.

(a) At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "same day sale" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

(b) If this option is a Nonstatutory Stock Option, then upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the minimum amount of tax required to be withheld by law (or such lower amount as may be necessary to avoid classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

(c) You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

13. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option.

14. NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the

United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

15. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control. In addition, your option (and any compensation paid or shares issued under your option) is subject to recoupment in accordance with The Dodd–Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any clawback policy adopted by the Company and any compensation recovery policy otherwise required by applicable law.

16. OTHER DOCUMENTS. You hereby acknowledge receipt of and the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Plan prospectus. In addition, you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

17. EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of this option will not be included as compensation, earnings, salaries, or other similar terms used when calculating your benefits under any employee benefit plan sponsored by the Company or any Affiliate, except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any of the Company's or any Affiliate's employee benefit plans.

18. VOTING RIGHTS. You will not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this option until such shares are issued to you. Upon such issuance, you will obtain full voting and other rights as a stockholder of the Company. Nothing contained in this option, and no action taken pursuant to its provisions, will create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

19. SEVERABILITY. If all or any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

20. MISCELLANEOUS.

(a) The rights and obligations of the Company under your option will be transferable to any one or more persons or entities, and all covenants and agreements hereunder will inure to the benefit of, and be enforceable by the Company's successors and assigns.

(b) You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your option.

(c) You acknowledge and agree that you have reviewed your option in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your option, and fully understand all provisions of your option.

(d) This Option Agreement will be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

(e) All obligations of the Company under the Plan and this Option Agreement will be binding on any successor to the Company, whether the existence of such successor is the result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

* * *

This Option Agreement will be deemed to be signed by you upon the signing by you of the Stock Option Grant Notice to which it is attached.

CELLADON CORPORATION
2013 EQUITY INCENTIVE PLAN

OPTION AGREEMENT
(INCENTIVE STOCK OPTION OR NONSTATUTORY STOCK OPTION)

Pursuant to your Stock Option Grant Notice ("***Grant Notice***") and this Option Agreement, Celladon Corporation (the "***Company***") has granted you an option under its 2013 Equity Incentive Plan (the "***Plan***") to purchase the number of shares of the Company's Common Stock indicated in your Grant Notice at the exercise price indicated in your Grant Notice. The option is granted to you effective as of the date of grant set forth in the Grant Notice (the "***Date of Grant***"). If there is any conflict between the terms in this Option Agreement and the Plan, the terms of the Plan will control. Capitalized terms not explicitly defined in this Option Agreement or in the Grant Notice but defined in the Plan will have the same definitions as in the Plan.

The details of your option, in addition to those set forth in the Grant Notice and the Plan, are as follows:

1. VESTING. Subject to the provisions contained herein and the potential vesting acceleration provisions set forth in Section 11 herein, your option will vest as provided in your Grant Notice. Vesting will cease upon the termination of your Continuous Service.

2. NUMBER OF SHARES AND EXERCISE PRICE. The number of shares of Common Stock subject to your option and your exercise price per share in your Grant Notice will be adjusted for Capitalization Adjustments.

3. EXERCISE RESTRICTION FOR NON-EXEMPT EMPLOYEES. If you are an Employee eligible for overtime compensation under the Fair Labor Standards Act of 1938, as amended (that is, a "***Non-Exempt Employee***"), and except as otherwise provided in the Plan, you may not exercise your option until you have completed at least six (6) months of Continuous Service measured from the Date of Grant, even if you have already been an employee for more than six (6) months. Consistent with the provisions of the Worker Economic Opportunity Act, you may exercise your option as to any vested portion prior to such six (6) month anniversary in the case of (i) your death or disability, (ii) a Corporate Transaction in which your option is not assumed, continued or substituted, (iii) a Change in Control or (iv) your termination of Continuous Service on your "retirement" (as defined in the Company's benefit plans).

4. EXERCISE PRIOR TO VESTING ("EARLY EXERCISE"). If permitted in your Grant Notice (*i.e.*, the "Exercise Schedule" indicates "Early Exercise Permitted") and subject to the provisions of your option, you may elect at any time that is both (i) during the period of your Continuous Service and (ii) during the term of your option, to exercise all or part of your option, including the unvested portion of your option; *provided, however,* that:

(a) a partial exercise of your option will be deemed to cover first vested shares of Common Stock and then the earliest vesting installment of unvested shares of Common Stock;

(b) any shares of Common Stock so purchased from installments that have not vested as of the date of exercise will be subject to the purchase option in favor of the Company as described in the Company's form of Early Exercise Stock Purchase Agreement;

(c) you will enter into the Company's form of Early Exercise Stock Purchase Agreement with a vesting schedule that will result in the same vesting as if no early exercise had occurred; and

(d) if your option is an Incentive Stock Option, then, to the extent that the aggregate Fair Market Value (determined at the Date of Grant) of the shares of Common Stock with respect to which your option plus all other Incentive Stock Options you hold are exercisable for the first time by you during any calendar year (under all plans of the Company and its Affiliates) exceeds one hundred thousand dollars ($100,000), your option(s) or portions thereof that exceed such limit (according to the order in which they were granted) will be treated as Nonstatutory Stock Options.

5. METHOD OF PAYMENT. You must pay the full amount of the exercise price for the shares you wish to exercise. You may pay the exercise price in cash or by check, bank draft or money order payable to the Company or in any other manner ***permitted by your Grant Notice,*** which may include one or more of the following:

(a) Provided that at the time of exercise the Common Stock is publicly traded, pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of Common Stock, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds. This manner of payment is also known as a "broker-assisted exercise", "same day sale", or "sell to cover".

(b) Provided that at the time of exercise the Common Stock is publicly traded, by delivery to the Company (either by actual delivery or attestation) of already-owned shares of Common Stock that are owned free and clear of any liens, claims, encumbrances or security interests, and that are valued at Fair Market Value on the date of exercise. "Delivery" for these purposes, in the sole discretion of the Company at the time you exercise your option, will include delivery to the Company of your attestation of ownership of such shares of Common Stock in a form approved by the Company. You may not exercise your option by delivery to the Company of Common Stock if doing so would violate the provisions of any law, regulation or agreement restricting the redemption of the Company's stock.

(c) If this option is a Nonstatutory Stock Option, subject to the consent of the Company at the time of exercise, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise of your option by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price. You must pay any remaining balance of the aggregate exercise price not satisfied by the "net exercise" in cash or other permitted form of payment. Shares of Common Stock will no longer be outstanding under your option and will not be exercisable thereafter if those shares (i) are used to pay the exercise price pursuant to the "net exercise," (ii)

are delivered to you as a result of such exercise, and (iii) are withheld to satisfy your tax withholding obligations.

6. WHOLE SHARES. You may exercise your option only for whole shares of Common Stock.

7. SECURITIES LAW COMPLIANCE. In no event may you exercise your option unless the shares of Common Stock issuable upon exercise are then registered under the Securities Act or, if not registered, the Company has determined that your exercise and the issuance of the shares would be exempt from the registration requirements of the Securities Act. The exercise of your option also must comply with all other applicable laws and regulations governing your option, and you may not exercise your option if the Company determines that such exercise would not be in material compliance with such laws and regulations (including any restrictions on exercise required for compliance with Treas. Reg. 1.401(k)-1(d)(3), if applicable).

8. TERM. You may not exercise your option before the Date of Grant or after the expiration of the option's term. The term of your option expires, subject to the provisions of Section 5(h) of the Plan, upon the earliest of the following:

(a) immediately upon the termination of your Continuous Service for Cause;

(b) three (3) months after the termination of your Continuous Service for any reason other than Cause, your Disability or your death (except as otherwise provided in Section 8(d) below); *provided*, *however*, that if during any part of such three (3) month period your option is not exercisable solely because of the condition set forth in the section above relating to "Securities Law Compliance," your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service; *provided further*, if during any part of such three (3) month period, the sale of any Common Stock received upon exercise of your option would violate the Company's insider trading policy, then your option will not expire until the earlier of the Expiration Date or until it has been exercisable for an aggregate period of three (3) months after the termination of your Continuous Service during which the sale of the Common Stock received upon exercise of your option would not be in violation of the Company's insider trading policy. Notwithstanding the foregoing, if (i) you are a Non-Exempt Employee, (ii) your Continuous Service terminates within six (6) months after the Date of Grant, and (iii) you have vested in a portion of your option at the time of your termination of Continuous Service, your option will not expire until the earlier of (x) the later of (A) the date that is seven (7) months after the Date of Grant, and (B) the date that is three (3) months after the termination of your Continuous Service, and (y) the Expiration Date;

(c) twelve (12) months after the termination of your Continuous Service due to your Disability (except as otherwise provided in Section 8(d)) below;

(d) eighteen (18) months after your death if you die either during your Continuous Service or within three (3) months after your Continuous Service terminates for any reason other than Cause;

(e) the Expiration Date indicated in your Grant Notice; or

(f) the day before the tenth (10th) anniversary of the Date of Grant.

If your option is an Incentive Stock Option, note that to obtain the federal income tax advantages associated with an Incentive Stock Option, the Code requires that at all times beginning on the Date of Grant and ending on the day three (3) months before the date of your option's exercise, you must be an employee of the Company or an Affiliate, except in the event of your death or Disability. The Company has provided for extended exercisability of your option under certain circumstances for your benefit but cannot guarantee that your option will necessarily be treated as an Incentive Stock Option if you continue to provide services to the Company or an Affiliate as a Consultant or Director after your employment terminates or if you otherwise exercise your option more than three (3) months after the date your employment with the Company or an Affiliate terminates.

9. EXERCISE.

(a) You may exercise the vested portion of your option (and the unvested portion of your option if your Grant Notice so permits) during its term by (i) delivering a Notice of Exercise (in a form designated by the Company) or completing such other documents and/or procedures designated by the Company for exercise and (ii) paying the exercise price and any applicable withholding taxes to the Company's Secretary, stock plan administrator, or such other person as the Company may designate, together with such additional documents as the Company may then require.

(b) By exercising your option you agree that, as a condition to any exercise of your option, the Company may require you to enter into an arrangement providing for the payment by you to the Company of any tax withholding obligation of the Company arising by reason of (i) the exercise of your option, (ii) the lapse of any substantial risk of forfeiture to which the shares of Common Stock are subject at the time of exercise, or (iii) the disposition of shares of Common Stock acquired upon such exercise.

(c) If your option is an Incentive Stock Option, by exercising your option you agree that you will notify the Company in writing within fifteen (15) days after the date of any disposition of any of the shares of the Common Stock issued upon exercise of your option that occurs within two (2) years after the Date of Grant or within one (1) year after such shares of Common Stock are transferred upon exercise of your option.

(d) By accepting your option you agree that you will not sell, dispose of, transfer, make any short sale of, grant any option for the purchase of, or enter into any hedging or similar transaction with the same economic effect as a sale, any shares of Common Stock or other securities of the Company held by you, for a period of one hundred eighty (180) days following the effective date of a registration statement of the Company filed under the Securities Act or such longer period as the underwriters or the Company will request to facilitate compliance with FINRA Rule 2711 or NYSE Member Rule 472 or any successor or similar rules or regulation (the "***Lock-Up Period***"); *provided, however*, that nothing contained in this section will prevent the exercise of a repurchase option, if any, in favor of the Company during the Lock-Up Period. You further agree to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing

or that are necessary to give further effect thereto. In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to your shares of Common Stock until the end of such period. You also agree that any transferee of any shares of Common Stock (or other securities) of the Company held by you will be bound by this Section 9(d). The underwriters of the Company's stock are intended third party beneficiaries of this Section 9(d) and will have the right, power and authority to enforce the provisions hereof as though they were a party hereto.

10. TRANSFERABILITY. Except as otherwise provided in this Section 10, your option is not transferable, except by will or by the laws of descent and distribution, and is exercisable during your life only by you.

(a) Certain Trusts. Upon receiving written permission from the Board or its duly authorized designee, you may transfer your option to a trust if you are considered to be the sole beneficial owner (determined under Section 671 of the Code and applicable state law) while the option is held in the trust. You and the trustee must enter into transfer and other agreements required by the Company.

(b) Domestic Relations Orders. Upon receiving written permission from the Board or its duly authorized designee, and provided that you and the designated transferee enter into transfer and other agreements required by the Company, you may transfer your option pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulation 1.421-1(b)(2) that contains the information required by the Company to effectuate the transfer. You are encouraged to discuss the proposed terms of any division of this option with the Company prior to finalizing the domestic relations order or marital settlement agreement to help ensure the required information is contained within the domestic relations order or marital settlement agreement. If this option is an Incentive Stock Option, this option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(c) Beneficiary Designation. Upon receiving written permission from the Board or its duly authorized designee, you may, by delivering written notice to the Company, in a form approved by the Company and any broker designated by the Company to handle option exercises, designate a third party who, on your death, will thereafter be entitled to exercise this option and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, your executor or administrator of your estate will be entitled to exercise this option and receive, on behalf of your estate, the Common Stock or other consideration resulting from such exercise.

11. CHANGE IN CONTROL.

(a) If a Change in Control occurs and within three (3) months prior to or within twelve (12) months after, the effective time of such Change in Control your Continuous Service terminates due to an involuntary termination (not including death or Disability) without Cause or due to a voluntary termination with Good Reason, then, as of the date of termination of Continuous Service, the vesting and exercisability of your option will be accelerated in full.

(b) "***Good Reason***" means that one or more of the following are undertaken by the Company (or successor to the Company, if applicable) without your express written consent: (i) a material reduction in your annual base salary, which you agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated employees); (ii) a material reduction in your authority, duties or responsibilities; (iii) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report; (iv) a relocation of your principal place of employment with the Company (or successor to the Company, if applicable) to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (iv) shall not apply.

(c) If any payment or benefit you would receive from the Company or otherwise in connection with a Change in Control or other similar transaction (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A of the Code that would not otherwise be subject to taxes pursuant to Section 409A of the Code, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A of the Code as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A of the Code shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A of the Code.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the

foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section, you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

12. OPTION NOT A SERVICE CONTRACT. Your option is not an employment or service contract, and nothing in your option will be deemed to create in any way whatsoever any obligation on your part to continue in the employ of the Company or an Affiliate, or of the Company or an Affiliate to continue your employment. In addition, nothing in your option will obligate the Company or an Affiliate, their respective stockholders, boards of directors, officers or employees to continue any relationship that you might have as a Director or Consultant for the Company or an Affiliate.

13. WITHHOLDING OBLIGATIONS.

(a) At the time you exercise your option, in whole or in part, and at any time thereafter as requested by the Company, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for (including by means of a "same day sale" pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board to the extent permitted by the Company), any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or an Affiliate, if any, which arise in connection with the exercise of your option.

(b) If this option is a Nonstatutory Stock Option, then upon your request and subject to approval by the Company, and compliance with any applicable legal conditions or restrictions, the Company may withhold from fully vested shares of Common Stock otherwise issuable to you upon the exercise of your option a number of whole shares of Common Stock having a Fair Market Value, determined by the Company as of the date of exercise, not in excess of the minimum amount of tax required to be withheld by law (or such lower amount as may be necessary to avoid classification of your option as a liability for financial accounting purposes). If the date of determination of any tax withholding obligation is deferred to a date later than the

date of exercise of your option, share withholding pursuant to the preceding sentence shall not be permitted unless you make a proper and timely election under Section 83(b) of the Code, covering the aggregate number of shares of Common Stock acquired upon such exercise with respect to which such determination is otherwise deferred, to accelerate the determination of such tax withholding obligation to the date of exercise of your option. Notwithstanding the filing of such election, shares of Common Stock shall be withheld solely from fully vested shares of Common Stock determined as of the date of exercise of your option that are otherwise issuable to you upon such exercise. Any adverse consequences to you arising in connection with such share withholding procedure shall be your sole responsibility.

(c) You may not exercise your option unless the tax withholding obligations of the Company and/or any Affiliate are satisfied. Accordingly, you may not be able to exercise your option when desired even though your option is vested, and the Company will have no obligation to issue a certificate for such shares of Common Stock or release such shares of Common Stock from any escrow provided for herein, if applicable, unless such obligations are satisfied.

14. TAX CONSEQUENCES. You hereby agree that the Company does not have a duty to design or administer the Plan or its other compensation programs in a manner that minimizes your tax liabilities. You will not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from your option or your other compensation. In particular, you acknowledge that this option is exempt from Section 409A of the Code only if the exercise price per share specified in the Grant Notice is at least equal to the "fair market value" per share of the Common Stock on the Date of Grant and there is no other impermissible deferral of compensation associated with the option.

15. NOTICES. Any notices provided for in your option or the Plan will be given in writing (including electronically) and will be deemed effectively given upon receipt or, in the case of notices delivered by mail by the Company to you, five (5) days after deposit in the United States mail, postage prepaid, addressed to you at the last address you provided to the Company. The Company may, in its sole discretion, decide to deliver any documents related to participation in the Plan and this option by electronic means or to request your consent to participate in the Plan by electronic means. By accepting this option, you consent to receive such documents by electronic delivery and to participate in the Plan through an on-line or electronic system established and maintained by the Company or another third party designated by the Company.

16. GOVERNING PLAN DOCUMENT. Your option is subject to all the provisions of the Plan, the provisions of which are hereby made a part of your option, and is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. If there is any conflict between the provisions of your option and those of the Plan, the provisions of the Plan will control. In addition, your option (and any compensation paid or shares issued under your option) is subject to recoupment in accordance with The Dodd–Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any clawback policy adopted by the Company and any compensation recovery policy otherwise required by applicable law.

17. OTHER DOCUMENTS. You hereby acknowledge receipt of and the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Plan prospectus. In addition, you acknowledge receipt of the Company's policy permitting certain individuals to sell shares only during certain "window" periods and the Company's insider trading policy, in effect from time to time.

18. EFFECT ON OTHER EMPLOYEE BENEFIT PLANS. The value of this option will not be included as compensation, earnings, salaries, or other similar terms used when calculating your benefits under any employee benefit plan sponsored by the Company or any Affiliate, except as such plan otherwise expressly provides. The Company expressly reserves its rights to amend, modify, or terminate any of the Company's or any Affiliate's employee benefit plans.

19. VOTING RIGHTS. You will not have voting or any other rights as a stockholder of the Company with respect to the shares to be issued pursuant to this option until such shares are issued to you. Upon such issuance, you will obtain full voting and other rights as a stockholder of the Company. Nothing contained in this option, and no action taken pursuant to its provisions, will create or be construed to create a trust of any kind or a fiduciary relationship between you and the Company or any other person.

20. SEVERABILITY. If all or any part of this Option Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Option Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Option Agreement (or part of such a Section) so declared to be unlawful or invalid shall, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

21. MISCELLANEOUS.

(a) The rights and obligations of the Company under your option will be transferable to any one or more persons or entities, and all covenants and agreements hereunder will inure to the benefit of, and be enforceable by the Company's successors and assigns.

(b) You agree upon request to execute any further documents or instruments necessary or desirable in the sole determination of the Company to carry out the purposes or intent of your option.

(c) You acknowledge and agree that you have reviewed your option in its entirety, have had an opportunity to obtain the advice of counsel prior to executing and accepting your option, and fully understand all provisions of your option.

(d) This Option Agreement will be subject to all applicable laws, rules, and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

(e) All obligations of the Company under the Plan and this Option Agreement will be binding on any successor to the Company, whether the existence of such successor is the

result of a direct or indirect purchase, merger, consolidation, or otherwise, of all or substantially all of the business and/or assets of the Company.

* * *

This Option Agreement will be deemed to be signed by you upon the signing by you of the Stock Option Grant Notice to which it is attached.

NOTICE OF EXERCISE

Celladon Corporation
12760 High Bluff Drive Suite 240
San Diego, CA 92130

Date of Exercise:

This constitutes notice to Celladon Corporation (the "***Company***") under my stock option that I elect to purchase the below number of shares of Common Stock of the Company (the "***Shares***") for the price set forth below.

Type of option (check one):		Incentive ☐	Nonstatutory ☐
Stock option dated:			
Number of Shares as to which option is exercised:			
Certificates to be issued in name of:			
Total exercise price:		$	$
Cash payment delivered herewith:		$	$
[Value of	Shares delivered herewith[1]:	$	$]
[Value of	Shares pursuant to net exercise[2]:	$	$]
[Regulation T Program (cashless exercise[3]):		$	$]

1 Shares must meet the public trading requirements set forth in the option. Shares must be valued in accordance with the terms of the option being exercised, and must be owned free and clear of any liens, claims, encumbrances or security interests. Certificates must be endorsed or accompanied by an executed assignment separate from certificate.

2 The option must be a Nonstatutory Stock Option, and Celladon Corporation must have established net exercise procedures at the time of exercise, in order to utilize this payment method.

3 Shares must meet the public trading requirements set forth in the option.

By this exercise, I agree (i) to provide such additional documents as you may require pursuant to the terms of the Celladon Corporation 2013 Equity Incentive Plan, (ii) to provide for the payment by me to you (in the manner designated by you) of your withholding obligation, if any, relating to the exercise of this option, and (iii) if this exercise relates to an incentive stock option, to notify you in writing within fifteen (15) days after the date of any disposition of any of the Shares issued upon exercise of this option.

Very truly yours,

_____

CELLADON CORPORATION

2013 EMPLOYEE STOCK PURCHASE PLAN
ADOPTED BY THE BOARD OF DIRECTORS: , 2013
APPROVED BY THE STOCKHOLDERS: , 2013

1. GENERAL; PURPOSE.

(a) The Plan provides a means by which Eligible Employees of the Company and certain designated Related Corporations may be given an opportunity to purchase shares of Common Stock. The Plan permits the Company to grant a series of Purchase Rights to Eligible Employees under an Employee Stock Purchase Plan.

(b) The Company, by means of the Plan, seeks to retain the services of such Employees, to secure and retain the services of new Employees and to provide incentives for such persons to exert maximum efforts for the success of the Company and its Related Corporations.

2. ADMINISTRATION.

(a) The Board will administer the Plan unless and until the Board delegates administration of the Plan to a Committee or Committees, as provided in Section 2(c).

(b) The Board will have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine how and when Purchase Rights will be granted and the provisions of each Offering (which need not be identical).

(ii) To designate from time to time which Related Corporations of the Company will be eligible to participate in the Plan.

(iii) To construe and interpret the Plan and Purchase Rights, and to establish, amend and revoke rules and regulations for its administration. The Board, in the exercise of this power, may correct any defect, omission or inconsistency in the Plan, in a manner and to the extent it deems necessary or expedient to make the Plan fully effective.

(iv) To settle all controversies regarding the Plan and Purchase Rights granted under the Plan.

(v) To suspend or terminate the Plan at any time as provided in Section 12.

(vi) To amend the Plan at any time as provided in Section 12.

(vii) Generally, to exercise such powers and to perform such acts as it deems necessary or expedient to promote the best interests of the Company and its Related Corporations and to carry out the intent that the Plan be treated as an Employee Stock Purchase Plan.

(viii) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees who are foreign nationals or employed outside the United States.

(c) The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration is delegated to a Committee, the Committee will have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board will thereafter be to the Committee or subcommittee), subject, however, to such resolutions, not inconsistent with the provisions of the Plan, as may be adopted from time to time by the Board. The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, revest in the Board some or all of the powers previously delegated. Whether or not the Board has delegated administration of the Plan to a Committee, the Board will have the final power to determine all questions of policy and expediency that may arise in the administration of the Plan.

(d) All determinations, interpretations and constructions made by the Board in good faith will not be subject to review by any person and will be final, binding and conclusive on all persons.

3. SHARES OF COMMON STOCK SUBJECT TO THE PLAN.

(a) Subject to the provisions of Section 11(a) relating to Capitalization Adjustments, the maximum number of shares of Common Stock that may be issued under the Plan will not exceed 2,070,000 shares of Common Stock, plus the number of shares of Common Stock that are automatically added on January 1st of each year for a period of up to ten years, commencing on the first January 1 following the IPO Date and ending on (and including) January 1, 2023, in an amount equal to the lesser of (i) 1% of the total number of shares of Capital Stock outstanding on December 31st of the preceding calendar year, and (ii) 4,800,000 shares of Common Stock. Notwithstanding the foregoing, the Board may act prior to the first day of any calendar year to provide that there will be no January 1st increase in the share reserve for such calendar year or that the increase in the share reserve for such calendar year will be a lesser number of shares of Common Stock than would otherwise occur pursuant to the preceding sentence.

(b) If any Purchase Right granted under the Plan terminates without having been exercised in full, the shares of Common Stock not purchased under such Purchase Right will again become available for issuance under the Plan.

(c) The stock purchasable under the Plan will be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the open market.

4. GRANT OF PURCHASE RIGHTS; OFFERING.

(a) The Board may from time to time grant or provide for the grant of Purchase Rights to Eligible Employees under an Offering (consisting of one or more Purchase Periods) on an Offering Date or Offering Dates selected by the Board. Each Offering will be in such form and will contain such terms and conditions as the Board will deem appropriate, and will comply

with the requirement of Section 423(b)(5) of the Code that all Employees granted Purchase Rights will have the same rights and privileges. The terms and conditions of an Offering shall be incorporated by reference into the Plan and treated as part of the Plan. The provisions of separate Offerings need not be identical, but each Offering will include (through incorporation of the provisions of this Plan by reference in the document comprising the Offering or otherwise) the period during which the Offering will be effective, which period will not exceed 27 months beginning with the Offering Date, and the substance of the provisions contained in Sections 5 through 8, inclusive.

(b) If a Participant has more than one Purchase Right outstanding under the Plan, unless he or she otherwise indicates in forms delivered to the Company: (i) each form will apply to all of his or her Purchase Rights under the Plan, and (ii) a Purchase Right with a lower exercise price (or an earlier-granted Purchase Right, if different Purchase Rights have identical exercise prices) will be exercised to the fullest possible extent before a Purchase Right with a higher exercise price (or a later-granted Purchase Right if different Purchase Rights have identical exercise prices) will be exercised.

(c) The Board will have the discretion to structure an Offering so that if the Fair Market Value of a share of Common Stock on the first Trading Day of a new Purchase Period within that Offering is less than or equal to the Fair Market Value of a share of Common Stock on the Offering Date for that Offering, then (i) that Offering will terminate immediately as of that first Trading Day, and (ii) the Participants in such terminated Offering will be automatically enrolled in a new Offering beginning on the first Trading Day of such new Purchase Period.

5. ELIGIBILITY.

(a) Purchase Rights may be granted only to Employees of the Company or, as the Board may designate in accordance with Section 2(b), to Employees of a Related Corporation. Except as provided in Section 5(b), an Employee will not be eligible to be granted Purchase Rights unless, on the Offering Date, the Employee has been in the employ of the Company or the Related Corporation, as the case may be, for such continuous period preceding such Offering Date as the Board may require, but in no event will the required period of continuous employment be equal to or greater than two years. In addition, the Board may provide that no Employee will be eligible to be granted Purchase Rights under the Plan unless, on the Offering Date, such Employee's customary employment with the Company or the Related Corporation is more than 20 hours per week and more than five months per calendar year or such other criteria as the Board may determine consistent with Section 423 of the Code.

(b) The Board may provide that each person who, during the course of an Offering, first becomes an Eligible Employee will, on a date or dates specified in the Offering which coincides with the day on which such person becomes an Eligible Employee or which occurs thereafter, receive a Purchase Right under that Offering, which Purchase Right will thereafter be deemed to be a part of that Offering. Such Purchase Right will have the same characteristics as any Purchase Rights originally granted under that Offering, as described herein, except that:

(i) the date on which such Purchase Right is granted will be the "Offering Date" of such Purchase Right for all purposes, including determination of the exercise price of such Purchase Right;

(ii) the period of the Offering with respect to such Purchase Right will begin on its Offering Date and end coincident with the end of such Offering; and

(iii) the Board may provide that if such person first becomes an Eligible Employee within a specified period of time before the end of the Offering, he or she will not receive any Purchase Right under that Offering.

(c) No Employee will be eligible for the grant of any Purchase Rights if, immediately after any such Purchase Rights are granted, such Employee owns stock possessing five percent or more of the total combined voting power or value of all classes of stock of the Company or of any Related Corporation. For purposes of this Section 5(c), the rules of Section 424(d) of the Code will apply in determining the stock ownership of any Employee, and stock which such Employee may purchase under all outstanding Purchase Rights and options will be treated as stock owned by such Employee.

(d) As specified by Section 423(b)(8) of the Code, an Eligible Employee may be granted Purchase Rights only if such Purchase Rights, together with any other rights granted under all Employee Stock Purchase Plans of the Company and any Related Corporations, do not permit such Eligible Employee's rights to purchase stock of the Company or any Related Corporation to accrue at a rate which exceeds $25,000 of Fair Market Value of such stock (determined at the time such rights are granted, and which, with respect to the Plan, will be determined as of their respective Offering Dates) for each calendar year in which such rights are outstanding at any time.

(e) Officers of the Company and any designated Related Corporation, if they are otherwise Eligible Employees, will be eligible to participate in Offerings under the Plan. Notwithstanding the foregoing, the Board may provide in an Offering that Employees who are highly compensated Employees within the meaning of Section 423(b)(4)(D) of the Code will not be eligible to participate.

6. PURCHASE RIGHTS; PURCHASE PRICE.

(a) On each Offering Date, each Eligible Employee, pursuant to an Offering made under the Plan, will be granted a Purchase Right to purchase up to that number of shares of Common Stock purchasable either with a percentage or with a maximum dollar amount, as designated by the Board, but in either case not exceeding 15% of such Employee's earnings (as defined by the Board in each Offering) during the period that begins on the Offering Date (or such later date as the Board determines for a particular Offering) and ends on the date stated in the Offering, which date will be no later than the end of the Offering.

(b) The Board will establish one or more Purchase Dates during an Offering on which Purchase Rights granted for that Offering will be exercised and shares of Common Stock will be purchased in accordance with such Offering.

(c) In connection with each Offering made under the Plan, the Board may specify (i) a maximum number of shares of Common Stock that may be purchased by any Participant on any Purchase Date during such Offering, (ii) a maximum aggregate number of shares of Common Stock that may be purchased by all Participants pursuant to such Offering and/or (iii) a maximum aggregate number of shares of Common Stock that may be purchased by all Participants on any Purchase Date under the Offering. If the aggregate purchase of shares of Common Stock issuable upon exercise of Purchase Rights granted under the Offering would exceed any such maximum aggregate number, then, in the absence of any Board action otherwise, a pro rata (based on each Participant's accumulated Contributions) allocation of the shares of Common Stock available will be made in as nearly a uniform manner as will be practicable and equitable.

(d) The purchase price of shares of Common Stock acquired pursuant to Purchase Rights will be not less than the lesser of:

(i) an amount equal to 85% of the Fair Market Value of the shares of Common Stock on the Offering Date; or

(ii) an amount equal to 85% of the Fair Market Value of the shares of Common Stock on the applicable Purchase Date.

7. PARTICIPATION; WITHDRAWAL; TERMINATION.

(a) An Eligible Employee may elect to authorize payroll deductions as the means of making Contributions by completing and delivering to the Company, within the time specified in the Offering, an enrollment form provided by the Company. The enrollment form will specify the amount of Contributions not to exceed the maximum amount specified by the Board. Each Participant's Contributions will be credited to a bookkeeping account for such Participant under the Plan and will be deposited with the general funds of the Company except where applicable law requires that Contributions be deposited with a third party. If permitted in the Offering, a Participant may begin such Contributions with the first payroll occurring on or after the Offering Date (or, in the case of a payroll date that occurs after the end of the prior Offering but before the Offering Date of the next new Offering, Contributions from such payroll will be included in the new Offering). If permitted in the Offering, a Participant may thereafter reduce (including to zero) or increase his or her Contributions. If specifically provided in the Offering, in addition to making Contributions by payroll deductions, a Participant may make Contributions through the payment by cash or check prior to a Purchase Date.

(b) During an Offering, a Participant may cease making Contributions and withdraw from the Offering by delivering to the Company a withdrawal form provided by the Company. The Company may impose a deadline before a Purchase Date for withdrawing. Upon such withdrawal, such Participant's Purchase Right in that Offering will immediately terminate and the Company will distribute to such Participant all of his or her accumulated but unused Contributions and such Participant's Purchase Right in that Offering shall thereupon terminate. A Participant's withdrawal from that Offering will have no effect upon his or her eligibility to participate in any other Offerings under the Plan, but such Participant will be required to deliver a new enrollment form to participate in subsequent Offerings.

(c) Purchase Rights granted pursuant to any Offering under the Plan will terminate immediately if the Participant either (i) is no longer an Employee for any reason or for no reason (subject to any post-employment participation period required by law) or (ii) is otherwise no longer eligible to participate. The Company will distribute to such individual all of his or her accumulated but unused Contributions.

(d) During a Participant's lifetime, Purchase Rights will be exercisable only by such Participant. Purchase Rights are not transferable by a Participant, except by will, by the laws of descent and distribution, or, if permitted by the Company, by a beneficiary designation as described in Section 10.

(e) Unless otherwise specified in the Offering, the Company will have no obligation to pay interest on Contributions.

8. EXERCISE OF PURCHASE RIGHTS.

(a) On each Purchase Date, each Participant's accumulated Contributions will be applied to the purchase of shares of Common Stock, up to the maximum number of shares of Common Stock permitted by the Plan and the applicable Offering, at the purchase price specified in the Offering. No fractional shares will be issued unless specifically provided for in the Offering.

(b) If any amount of accumulated Contributions remains in a Participant's account after the purchase of shares of Common Stock and such remaining amount is less than the amount required to purchase one share of Common Stock on the final Purchase Date of an Offering, then such remaining amount will be held in such Participant's account for the purchase of shares of Common Stock under the next Offering under the Plan, unless such Participant withdraws from or is not eligible to participate in such Offering, in which case such amount will be distributed to such Participant after the final Purchase Date, without interest. If the amount of Contributions remaining in a Participant's account after the purchase of shares of Common Stock is at least equal to the amount required to purchase one whole share of Common Stock on the final Purchase Date of an Offering, then such remaining amount will not roll over to the next Offering and will instead be distributed in full to such Participant after the final Purchase Date of such Offering without interest.

(c) No Purchase Rights may be exercised to any extent unless the shares of Common Stock to be issued upon such exercise under the Plan are covered by an effective registration statement pursuant to the Securities Act and the Plan is in material compliance with all applicable federal, state, foreign and other securities and other laws applicable to the Plan. If on a Purchase Date the shares of Common Stock are not so registered or the Plan is not in such compliance, no Purchase Rights will be exercised on such Purchase Date, and the Purchase Date will be delayed until the shares of Common Stock are subject to such an effective registration statement and the Plan is in material compliance, except that the Purchase Date will in no event be more than 6 months from the Offering Date. If, on the Purchase Date, as delayed to the maximum extent permissible, the shares of Common Stock are not registered and the Plan is not in material compliance with all applicable laws, no Purchase Rights will be exercised and all accumulated but unused Contributions will be distributed to the Participants without interest.

9. COVENANTS OF THE COMPANY.

The Company will seek to obtain from each federal, state, foreign or other regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Purchase Rights and issue and sell shares of Common Stock thereunder. If, after commercially reasonable efforts, the Company is unable to obtain the authority that counsel for the Company deems necessary for the grant of Purchase Rights or the lawful issuance and sale of Common Stock under the Plan, and at a commercially reasonable cost, the Company will be relieved from any liability for failure to grant Purchase Rights and/or to issue and sell Common Stock upon exercise of such Purchase Rights.

10. DESIGNATION OF BENEFICIARY.

(a) The Company may, but is not obligated to, permit a Participant to submit a form designating a beneficiary who will receive any shares of Common Stock and/or Contributions from the Participant's account under the Plan if the Participant dies before such shares and/or Contributions are delivered to the Participant. The Company may, but is not obligated to, permit the Participant to change such designation of beneficiary. Any such designation and/or change must be on a form approved by the Company.

(b) If a Participant dies, and in the absence of a valid beneficiary designation, the Company will deliver any shares of Common Stock and/or Contributions to the executor or administrator of the estate of the Participant. If no executor or administrator has been appointed (to the knowledge of the Company), the Company, in its sole discretion, may deliver such shares of Common Stock and/or Contributions to the Participant's spouse, dependents or relatives, or if no spouse, dependent or relative is known to the Company, then to such other person as the Company may designate.

11. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; CORPORATE TRANSACTIONS.

(a) In the event of a Capitalization Adjustment, the Board will appropriately and proportionately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities by which the share reserve is to increase automatically each year pursuant to Section 3(a), (iii) the class(es) and number of securities subject to, and the purchase price applicable to outstanding Offerings and Purchase Rights, and (iv) the class(es) and number of securities that are the subject of the purchase limits under each ongoing Offering. The Board will make these adjustments, and its determination will be final, binding and conclusive.

(b) In the event of a Corporate Transaction, then: (i) any surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) may assume or continue outstanding Purchase Rights or may substitute similar rights (including a right to acquire the same consideration paid to the stockholders in the Corporate Transaction) for outstanding Purchase Rights, or (ii) if any surviving or acquiring corporation (or its parent company) does not assume or continue such Purchase Rights or does not substitute similar rights for such Purchase Rights, then the Participants' accumulated Contributions will be used to purchase shares of Common Stock within ten business days prior to the Corporate Transaction

under the outstanding Purchase Rights, and the Purchase Rights will terminate immediately after such purchase.

12. AMENDMENT, TERMINATION OR SUSPENSION OF THE PLAN.

(a) The Board may amend the Plan at any time in any respect the Board deems necessary or advisable. However, except as provided in Section 11(a) relating to Capitalization Adjustments, stockholder approval will be required for any amendment of the Plan for which stockholder approval is required by applicable law or listing requirements, including any amendment that either (i) materially increases the number of shares of Common Stock available for issuance under the Plan, (ii) materially expands the class of individuals eligible to become Participants and receive Purchase Rights, (iii) materially increases the benefits accruing to Participants under the Plan or materially reduces the price at which shares of Common Stock may be purchased under the Plan, (iv) materially extends the term of the Plan, or (v) expands the types of awards available for issuance under the Plan, but in each of (i) through (v) above only to the extent stockholder approval is required by applicable law or listing requirements.

(b) The Board may suspend or terminate the Plan at any time. No Purchase Rights may be granted under the Plan while the Plan is suspended or after it is terminated.

(c) Any benefits, privileges, entitlements and obligations under any outstanding Purchase Rights granted before an amendment, suspension or termination of the Plan will not be materially impaired by any such amendment, suspension or termination except (i) with the consent of the person to whom such Purchase Rights were granted, (ii) as necessary to comply with any laws, listing requirements, or governmental regulations (including, without limitation, the provisions of Section 423 of the Code and the regulations and other interpretive guidance issued thereunder relating to Employee Stock Purchase Plans) including without limitation any such regulations or other guidance that may be issued or amended after the date the Plan is adopted by the Board, or (iii) as necessary to obtain or maintain favorable tax, listing, or regulatory treatment. To be clear, the Board may amend outstanding Purchase Rights without a Participant's consent if such amendment is necessary to ensure that the Purchase Right and/or the Plan complies with the requirements of Section 423 of the Code.

13. EFFECTIVE DATE OF PLAN.

The Plan will become effective immediately prior to and contingent upon the IPO Date. No Purchase Rights will be exercised unless and until the Plan has been approved by the stockholders of the Company, which approval must be within 12 months before or after the date the Plan is adopted (or if required under Section 12(a) above, materially amended) by the Board.

14. MISCELLANEOUS PROVISIONS.

(a) Proceeds from the sale of shares of Common Stock pursuant to Purchase Rights will constitute general funds of the Company.

(b) A Participant will not be deemed to be the holder of, or to have any of the rights of a holder with respect to, shares of Common Stock subject to Purchase Rights unless and until

the Participant's shares of Common Stock acquired upon exercise of Purchase Rights are recorded in the books of the Company (or its transfer agent).

(c) The Plan and Offering do not constitute an employment contract. Nothing in the Plan or in the Offering will in any way alter the at will nature of a Participant's employment or be deemed to create in any way whatsoever any obligation on the part of any Participant to continue in the employ of the Company or a Related Corporation, or on the part of the Company or a Related Corporation to continue the employment of a Participant.

(d) The provisions of the Plan will be governed by the laws of the State of California without resort to that state's conflicts of laws rules.

15. DEFINITIONS.

As used in the Plan, the following definitions will apply to the capitalized terms indicated below:

(a) "***Board***" means the Board of Directors of the Company.

(b) "***Capital Stock***" means each and every class of common stock of the Company, regardless of the number of votes per share.

(c) "***Capitalization Adjustment***" means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Purchase Right after the date the Plan is adopted by the Board without the receipt of consideration by the Company through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, large nonrecurring cash dividend, stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or other similar equity restructuring transaction, as that term is used in Financial Accounting Standards Board Accounting Standards Codification Topic 718 (or any successor thereto). Notwithstanding the foregoing, the conversion of any convertible securities of the Company will not be treated as a Capitalization Adjustment.

(d) "***Code***" means the Internal Revenue Code of 1986, as amended, including any applicable regulations and guidance thereunder.

(e) "***Committee***" means a committee of one or more members of the Board to whom authority has been delegated by the Board in accordance with Section 2(c).

(f) "***Common Stock***" means, as of the IPO Date, the common stock of the Company, having 1 vote per share.

(g) "***Company***" means Celladon Corporation, a Delaware corporation.

(h) "***Contributions***" means the payroll deductions and other additional payments specifically provided for in the Offering that a Participant contributes to fund the exercise of a Purchase Right. A Participant may make additional payments into his or her account if

specifically provided for in the Offering, and then only if the Participant has not already had the maximum permitted amount withheld during the Offering through payroll deductions.

(i) "***Corporate Transaction***" means the consummation, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) a sale or other disposition of all or substantially all, as determined by the Board in its sole discretion, of the consolidated assets of the Company and its Subsidiaries;

(ii) a sale or other disposition of at least 90% of the outstanding securities of the Company;

(iii) a merger, consolidation or similar transaction following which the Company is not the surviving corporation; or

(iv) a merger, consolidation or similar transaction following which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted or exchanged by virtue of the merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

(j) "***Director***" means a member of the Board.

(k) "***Eligible Employee***" means an Employee who meets the requirements set forth in the document(s) governing the Offering for eligibility to participate in the Offering, provided that such Employee also meets the requirements for eligibility to participate set forth in the Plan.

(l) "***Employee***" means any person, including an Officer or Director, who is "employed" for purposes of Section 423(b)(4) of the Code by the Company or a Related Corporation. However, service solely as a Director, or payment of a fee for such services, will not cause a Director to be considered an "Employee" for purposes of the Plan.

(m) "***Employee Stock Purchase Plan***" means a plan that grants Purchase Rights intended to be options issued under an "employee stock purchase plan," as that term is defined in Section 423(b) of the Code.

(n) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended and the rules and regulations promulgated thereunder.

(o) "***Fair Market Value***" means, as of any date, the value of the Common Stock determined as follows:

(i) If the Common Stock is listed on any established stock exchange or traded on any established market, the Fair Market Value of a share of Common Stock will be the **closing sales price** for such stock as quoted on such exchange or market (or the exchange or market with the greatest volume of trading in the Common Stock) **on the date of determination**, as reported in such source as the Board deems reliable. Unless otherwise provided by the Board, if there is no closing sales price for the Common Stock on the date of determination, then the

Fair Market Value will be the closing sales price on the last preceding date for which such quotation exists.

(ii) In the absence of such markets for the Common Stock, the Fair Market Value will be determined by the Board in good faith in compliance with applicable laws and in a manner that complies with Sections 409A of the Code.

(iii) Notwithstanding the foregoing, for any Offering that commences on the IPO Date, the Fair Market Value of the shares of Common Stock on the Offering Date will be the price per share at which shares are first sold to the public in the Company's initial public offering as specified in the final prospectus for that initial public offering.

(p) "***IPO Date***" means the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Common Stock, pursuant to which the Common Stock is priced for the initial public offering.

(q) "***Offering***" means the grant to Eligible Employees of Purchase Rights, with the exercise of those Purchase Rights automatically occurring at the end of one or more Purchase Periods. The terms and conditions of an Offering will generally be set forth in the "***Offering Document***" approved by the Board for that Offering.

(r) "***Offering Date***" means a date selected by the Board for an Offering to commence.

(s) "***Officer***" means a person who is an officer of the Company or a Related Corporation within the meaning of Section 16 of the Exchange Act.

(t) "***Participant***" means an Eligible Employee who holds an outstanding Purchase Right.

(u) "***Plan***" means this Celladon Corporation 2013 Employee Stock Purchase Plan.

(v) "***Purchase Date***" means one or more dates during an Offering selected by the Board on which Purchase Rights will be exercised and on which purchases of shares of Common Stock will be carried out in accordance with such Offering.

(w) "***Purchase Period***" means a period of time specified within an Offering, generally beginning on the Offering Date or on the first Trading Day following a Purchase Date, and ending on a Purchase Date. An Offering may consist of one or more Purchase Periods.

(x) "***Purchase Right***" means an option to purchase shares of Common Stock granted pursuant to the Plan.

(y) "***Related Corporation***" means any "parent corporation" or "subsidiary corporation" of the Company whether now or subsequently established, as those terms are defined in Sections 424(e) and (f), respectively, of the Code.

(z) "***Securities Act***" means the Securities Act of 1933, as amended.

(aa) "***Trading Day***" means any day on which the exchange(s) or market(s) on which shares of Common Stock are listed, including but not limited to the NYSE, Nasdaq Global Select Market, the Nasdaq Global Market, the Nasdaq Capital Market or any successors thereto, is open for trading.

CELLADON CORPORATION
NON-EMPLOYEE DIRECTOR COMPENSATION POLICY

Each member of the Board of Directors (the ***"Board"***) who is not also serving as an employee of Celladon Corporation (***"Celladon"***) or any of its subsidiaries (each such member, an ***"Eligible Director"***) will receive the compensation described in this Non-Employee Director Compensation Policy for his or her Board service on and following the date of the underwriting agreement between Celladon and the underwriters managing the initial public offering of the common stock of Celladon (the "***Common Stock***"), pursuant to which the Common Stock is priced in such initial public offering (the "***Effective Date***"). This policy is effective as of the Effective Date and may be amended at any time in the sole discretion of the Board or the Compensation Committee of the Board.

Annual Cash Compensation

The annual cash compensation amount set forth below is payable in equal quarterly installments, payable in arrears on the last day of each fiscal quarter in which the service occurred. If an Eligible Director joins the Board or a committee of the Board at a time other than effective as of the first day of a fiscal quarter, each annual retainer set forth below will be pro-rated based on days served in the applicable fiscal year, with the pro-rated amount paid for the first fiscal quarter in which the Eligible Director provides the service, and regular full quarterly payments thereafter. All annual cash fees are vested upon payment.

1. Annual Board Service Retainer:
    a. All Eligible Directors: $30,000
    b. Chairman of the Board Service Retainer (in addition to Eligible Director Service Retainer): $25,000

2. Annual Committee Member Service Retainer:
    a. Member of the Audit Committee: $7,500
    b. Member of the Compensation Committee: $5,000
    c. Member of the Nominating & Governance Committee: $3,000

3. Annual Committee Chair Service Retainer (in addition to Committee Member Service Retainer):
    a. Chairman of the Audit Committee: $15,000
    b. Chairman of the Compensation Committee: $10,000
    c. Chairman of the Nominating & Governance Committee: $6,500

Equity Compensation

The equity compensation set forth below will be granted under the Celladon Corporation 2013 Equity Incentive Plan (the ***"Plan"***), subject to the Celladon stockholders' approval of the Plan. All stock options granted under this policy will be nonstatutory stock options, with an exercise price per share equal to 100% of the Fair Market Value (as defined in the Plan) of the underlying

Common Stock on the date of grant, and a term of ten years from the date of grant (subject to earlier termination in connection with a termination of service as provided in the Plan).

1. Initial Grant: On (a) the Effective Date, for each Eligible Director who is serving on the Board as of such date, or (b) the date of the Eligible Director's initial election to the Board, for each Eligible Director who is first elected to the Board following the Effective Date (or, if either such date in (a) or (b) is not a market trading day, the first market trading day thereafter), the Eligible Director will be automatically, and without further action by the Board or Compensation Committee of the Board, granted a stock option for 20,000 shares. One-third of the shares subject to each stock option will vest on the one year anniversary of the date of grant and the balance of the shares will vest in a series of 24 equal monthly installments thereafter, such that the option is fully vested on the third anniversary of the date of grant, subject to the Eligible Director's Continuous Service (as defined in the Plan) through each such vesting date and will vest in full upon a Change in Control (as defined in the Plan).

2. Annual Grant: On the date of each Celladon's annual stockholder meeting held after the Effective Date, each Eligible Director who continues to serve as a non-employee member of the Board will be automatically, and without further action by the Board or Compensation Committee of the Board, granted a stock option for 10,000 shares. The shares subject to the stock option will vest on the one year anniversary of the date of grant, subject to the Eligible Director's Continuous Service (as defined in the Plan) through such vesting date and will vest in full upon a Change in Control (as defined in the Plan).

Exhibit 10.7

August 31, 2013

Jeffrey J. Rudy

Re: Employment Terms

Dear Jeffrey:

On behalf of Celladon Corporation (the "***Company***"), I am pleased to offer you continued employment at the Company on the terms set forth in this letter agreement (the "***Agreement***"). Subject to your acceptance by signing below, this Agreement will become effective upon the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Company's common stock, pursuant to which such common stock is priced for the initial public offering (the "***Effective Date***"). As of the Effective Date, this Agreement replaces and supersedes in its entirety the letter agreement between you and the Company dated May 3, 2006 (the "***Prior Agreement***"), as provided in Section 12 below.

1. Employment Position and Duties

You will continue to be employed as the Company's Vice President, Clinical Operations and you will report to the President and Chief Executive Officer of the Company. You shall perform the duties of such position as are customary, as specified in the Bylaws of the Company, and as may be required by the President and Chief Executive Officer of the Company or the Board of Directors of the Company (or any authorized committee thereof) (the "***Board***").

During your employment with the Company, you will devote your full-time best efforts and business time and attention to the business of the Company. Your employment relationship with the Company shall also be governed by the general employment policies and practices of the Company (except that if the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices, this Agreement will control), and you will be required to abide by the general employment policies and practices of the Company. The Company reserves the right to change your position, duties, reporting relationship, work location, and the Company's general employment policies and procedures, from time to time in its discretion.

2. Base Salary and Employee Benefits

Your base salary will be paid at the rate of $20,833.33 per month (an annual rate of $250,000), less payroll deductions and withholdings. You will be paid your base salary on a semi-monthly basis, on the Company's normal payroll schedule. As an exempt salaried employee, you will be required to work the Company's normal business hours, and such additional time as appropriate for your work assignments and positions. You will not be eligible for overtime premiums.

As a regular, full-time employee, you will be eligible to participate in the Company's standard employee benefits, pursuant to the terms and conditions of the benefit plans and the applicable Company policies. Subject to change, the Company currently provides group medical, dental and vision care insurance, a life, AD&D, long-term and short-term disability insurance program, a life insurance cash subsidy, a

health reimbursement arrangement and a 401(k) plan. The Company may change its compensation and benefits from time to time in its discretion. In addition to the Company's annual holiday schedule, you will accrue at a rate of 15 days per year of paid time off, including both vacation and sick leave, subject to a maximum accrual of 240 hours. This allowance is subject to the Company's policies with respect to accrual of, including limitations on the maximum permitted accrual of, paid time off and is subject to change in accordance with changes in Company policy.

3. Annual Performance Bonus

As Vice President, Clinical Operations, you will be eligible to earn an annual performance bonus (including for the full year in which this Agreement becomes effective) pursuant to the Company's annual incentive bonus plan, with the target amount of such bonus equal to thirty percent (30%) of your annual base salary. The bonus, if any, will be based upon the Board's assessment of your performance and the Company's attainment of targeted goals as set by the Board in its sole discretion. Bonus payments, if any, will be subject to applicable payroll deductions and withholdings. Following the close of each calendar year, the Board will determine whether you have earned a performance bonus, and the amount of any performance bonus, based on the set criteria. No amount of the annual bonus is guaranteed, and you must be an employee in good standing through the end of the applicable bonus determination period to earn and be eligible to receive a bonus; no partial or prorated bonuses will be provided (except as provided in Section 6 below). In all events, any earned bonus will be paid not later than March 15 of the year following the year in which your right to such amount became vested. Your base salary and bonus eligibility will be reviewed on an annual or more frequent basis by the Board, and are subject to change in the discretion of the Board. For the avoidance of doubt, all references in this agreement to the Board shall include any authorized committee of the Board.

4. Stock Options and Employee Stock Purchase Plan

You will be eligible to participate in and receive stock option or equity award grants under the Company's equity incentive plans from time to time in the discretion of the Board, and in accordance with the terms and conditions of such plans. Any stock options or other equity awards that you have been granted by the Company prior to the Effective Date will continue to be governed in all respects by the terms of the applicable grant notices, award agreements and plan documents.

In addition, we expect to adopt an employee stock purchase plan that will become effective upon the Effective Date. You will be eligible to participate in our employee stock purchase plan and purchase our common stock at a discount.

5. At-Will Employment Relationship

Your employment relationship is at will. You may terminate your employment with the Company at any time and for any reason whatsoever simply by notifying the Company. Likewise, the Company may terminate your employment at any time, with or without Cause (as defined below), and with or without advance notice. Your employment at-will status can only be modified in a written agreement approved by the Board and signed by you and a duly authorized member of the Board.

6. Severance Benefits.

In the event your employment with the Company is terminated for any reason, you will be entitled to all of your earned compensation and benefits or otherwise as required by law through the date of termination (the "***Accrued Amounts***"). For the avoidance of doubt, you shall not be entitled to any additional

compensation or benefits in the event your employment is terminated for Cause, due to your resignation without Good Reason, upon your death or upon your disability. If your employment terminates due to an Involuntary Termination (as defined below), you will be eligible to receive the additional compensation and benefits described in Section 6(a) and 6(b).

(a) Involuntary Termination other than in Connection with a Change in Control. If at any time (i) the Company terminates your employment without Cause (as defined below and other than as a result of your death or disability), or (ii) you resign for Good Reason (as defined below), and provided in any case such termination constitutes a "separation from service", as defined under Treasury Regulation Section 1.409A-1(h)) (a "***Separation from Service***") (such termination described in (i) or (ii), an "***Involuntary Termination***"), you shall be entitled to receive the following severance benefits, subject in all events to your compliance with Section 6(c) below:

(i) You shall receive severance pay in the form of continuation of your base salary in effect (ignoring any decrease that forms the basis for your resignation for Good Reason, if applicable) on the effective date of your Involuntary Termination for the first nine (9) months (the "***Severance Period***") after the date of such termination; and

(ii) If you are eligible for and timely elect to continue your health insurance coverage under the Company's group health plans under the Consolidated Omnibus Budget Reconciliation Act of 1985 or the state equivalent ("***COBRA***") following your termination date, the Company will pay the COBRA group health insurance premiums for you and your eligible dependents until the earliest of (A) the close of the Severance Period, (B) the expiration of your eligibility for the continuation coverage under COBRA, or (C) the date when you become eligible for substantially equivalent health insurance coverage in connection with new employment or self-employment. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by you under a Section 125 health care reimbursement plan under the U.S. Internal Revenue Code. Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether you elect continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay you on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to the COBRA premiums for that month, subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be equal to the amount that the Company would have otherwise paid for COBRA premiums, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date you voluntarily enroll in a health insurance plan offered by another employer or entity.

(b) Involuntary Termination in Connection with a Change in Control. In the event that your Involuntary Termination occurs within the three (3) months prior to, or twelve (12) months following the consummation of a Change in Control and subject in all events to your compliance with Section 6(c) below, then you shall be entitled to the benefits provided above in Section 6(a), except that:

(i) The Severance Period for purposes of continued salary and COBRA benefits shall be twelve (12) months, rather than nine (9) months; you shall receive a lump sum payment of your target bonus for the year of termination; and in addition,

(ii) The vesting of all of your outstanding stock options and other equity awards that are subject to time-based vesting requirements shall accelerate in full such that all such equity awards shall be deemed fully vested as of the date of your Involuntary Termination.

(c) Conditions and Timing for Severance Benefits. The severance benefits set forth in Sections 6(a) and 6(b) above are expressly conditioned upon: (i) your continuing to comply with your obligations under your Confidential Information Agreement (as defined in Section 8 below); and (ii) you signing and not revoking a general release of legal claims in the form attached hereto as **EXHIBIT A** or a substantially similar form provided that, for the avoidance of doubt, such form will include a commitment from you to comply with your continuing obligations under your Confidential Information Agreement, but will not include a noncompetition provision and will not include a release of any rights or claims for indemnification you may have pursuant to any written indemnification agreement with the Company to which you are a party, the Company's bylaws, or applicable law (the "***Release***") within the applicable deadline set forth therein and permitting the Release to become effective in accordance with its terms, which must occur no later than the Release Deadline (as defined in Section 7 below). The salary continuation payments described in Sections 6(a) and 6(b) will be paid in substantially equal installments on the Company's regular payroll schedule and subject to standard deductions and withholdings over the Severance Period following termination; *provided, however,* that no payments will be made prior to the effectiveness of the Release. On the effective date of the Release, the Company will pay you the salary continuation payments that you would have received on or prior to such date in a lump sum under the original schedule but for the delay while waiting for the effectiveness of the release, with the balance of the cash severance being paid as originally scheduled. Bonus payments described in Section 6(b) will be paid in a lump sum cash payment, subject to standard deductions and withholdings on the effective date of the Release.

(d) Definitions. For purposes of this Agreement:

(i) "***Cause***" means the occurrence of any of the following events, conditions or actions: (1) your conviction of any felony or your conviction of any crime involving fraud or dishonesty; (2) your participation (whether by affirmative act or omission) in any material fraud, material act of dishonesty or other material act of misconduct against the Company; (3) your willful and habitual neglect of your duties, provided you have been given written notice of such neglect and, if curable, a reasonable opportunity to cure, not to exceed thirty (30) days; (4) your material violation of any fiduciary duty or duty of loyalty owed to the Company; (5) your breach of any material term of any material contract between you and the Company which has a material adverse effect on the Company; (6) your knowing violation of any material Company policy which has a material adverse effect on the Company; or (7) your knowing violation of state or federal law in connection with the performance of your job which has a material adverse effect on the Company.

(ii) "***Change in Control***" shall have the meaning set forth in the Company's 2013 Equity Incentive Plan.

(iii) "***Good Reason***" means your resignation from employment with the Company (or successor to the Company, if applicable) due to any of the following actions taken by the Company (or successor to the Company, if applicable) without your prior written consent thereto: (1) a material reduction in your base salary, which the parties agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated employees); (2) a material reduction in your authority, duties or responsibilities; (3) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report, including a requirement that you report to a corporate officer or employee instead of reporting directly to the Board;

(4) a relocation of your principal place of employment to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (4) shall not apply. *Notwithstanding the foregoing*, in order to resign for Good Reason, you must (i) provide written notice to the Company within thirty (30) days after the first occurrence of the event giving rise to Good Reason setting forth the basis for your resignation, (ii) allow the Company at least sixty (60) days from receipt of such written notice to cure such event, and (iii) if such event is not reasonably cured within such period, your resignation from all positions you then hold with the Company is effective not later than thirty (30) days after the expiration of the cure period.

7. Tax Provisions.

(a) Section 409A. Notwithstanding anything in this Agreement to the contrary, the following provisions apply to the extent severance benefits provided herein are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the ***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***). Severance benefits shall not commence until you have a Separation from Service. Each installment of severance benefits is a separate "payment" for purposes of Treasury Regulations Section 1.409A-2(b)(2)(i), and the severance benefits are intended to satisfy the exemptions from application of Section 409A provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A-1(b)(9). However, if such exemptions are not available and you are, upon Separation from Service, a "specified employee" for purposes of Section 409A, then, solely to the extent necessary to avoid adverse personal tax consequences under Section 409A, the timing of the severance benefits payments shall be delayed until the earlier of (i) six (6) months and one day after your Separation from Service, or (ii) your death.

You shall receive severance benefits only if you execute and return to the Company the Release within the applicable time period set forth therein and permit such Release to become effective in accordance with its terms, which date may not be later than sixty (60) days following the date of your Separation from Service (such latest permitted date, the ***"Release Deadline"***). If the severance benefits are not covered by one or more exemptions from the application of Section 409A and the Release could become effective in the calendar year following the calendar year in which your Separation from Service occurs, the Release will not be deemed effective any earlier than the Release Deadline. None of the severance benefits will be paid or otherwise delivered prior to the effective date of the Release. Except to the minimum extent that payments must be delayed because you are a "specified employee" or until the effectiveness of the Release, all amounts will be paid as soon as practicable in accordance with the schedule provided herein and in accordance with the Company's normal payroll practices.

The severance benefits are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences under Section 409A, and any ambiguities herein shall be interpreted accordingly.

(b) Section 280G. If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment pursuant to this Agreement or otherwise (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account

all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 7(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 7(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 7(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

8. Compliance With Employee Confidentiality and Inventions Assignment and Company Policies

As a condition of employment, you will be required to continue to comply with the Company's Employee Confidentiality and Inventions Assignment that you executed on May 3, 2006, as may be amended by you and the Company from time to time (the "***Confidential Information Agreement***"), which prohibits unauthorized use or disclosure of the Company's proprietary information, among other obligations. In

addition, you will be expected to abide by the Company's rules and policies, as may be changed from time to time within the Company's sole discretion.

9. Protection of Third Party Information

In your work for the Company, you are expected not to use or disclose any confidential information, including trade secrets, of any former employer or other person to whom you have an obligation of confidentiality. Rather, you are expected to use only that information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. You agree that you will not bring onto Company premises, or use in the performance of your duties, any unpublished documents or property belonging to any former employer or other person to whom you have an obligation of confidentiality. You hereby represent that you have disclosed to the Company any contract you have signed that may restrict your activities on behalf of the Company.

10. Outside Activities

Throughout your employment with the Company, you may engage in civic and not-for-profit activities so long as such activities do not interfere with the performance of your duties hereunder or present a conflict of interest with the Company. Subject to the restrictions set forth herein and with the prior written consent of the Board, you may serve as a director of other corporations and may devote a reasonable amount of your time to other types of business or public activities not expressly mentioned in this paragraph. The Board may rescind its consent to your service as a director of all other corporations or participation in other business or public activities, if the Board, in its sole discretion, determines that such activities compromise or threaten to compromise the Company's business interests or conflict with your duties to the Company.

During your employment by the Company, except on behalf of the Company, you will not directly or indirectly serve as an officer, director, stockholder, employee, partner, proprietor, investor, joint venture, associate, representative or consultant of any other person, corporation, firm, partnership or other entity whatsoever that competes with the Company (or is planning or preparing to compete with the Company), anywhere in the world, in any line of business engaged in (or planned to be engaged in) by the Company; provided, however, that you may purchase or otherwise acquire up to (but not more than) one percent (1%) of any class of securities of any enterprise (but without participating in the activities of such enterprise) if such securities are listed on any national or regional securities exchange.

11. Dispute Resolution

To ensure the rapid and economical resolution of disputes that may arise in connection with your employment with the Company, you and the Company agree that any and all disputes, claims, or causes of action, in law or equity, including but not limited to statutory claims, arising from or relating to the enforcement, breach, performance, or interpretation of this Agreement, your employment with the Company, or the termination of your employment from the Company, shall be resolved, to the fullest extent permitted by law, by final, binding and confidential arbitration conducted before a single arbitrator by JAMS, Inc ("***JAMS***") or its successor, under JAMS' then applicable rules and procedures for employment disputes (which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you on request). The arbitration shall take place in the county (or comparable governmental unit) in which you were last employed by the Company, as determined by the arbitrator; provided that if the arbitrator determines there will be an undue hardship to you to have the arbitration in such location, the arbitrator will choose an alternative appropriate location. You and the Company each acknowledge

that by agreeing to this arbitration procedure, you waive the right to resolve any such dispute through a trial by jury or judge or administrative proceeding. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator, and not a court, shall also be authorized to determine whether the provisions of this section apply to a dispute, controversy, or claim sought to be resolved in accordance with these arbitration procedures. The Company shall pay all arbitration fees and costs in excess of the administrative fees that you would be required to incur if the dispute were filed or decided in a court of law. Nothing in this Agreement is intended to prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration.

12. Miscellaneous

This Agreement, together with your Confidential Information Agreement, forms the complete and exclusive statement of your employment agreement with the Company. It supersedes the Prior Agreement and any other agreements or promises made to you by anyone, whether oral or written, except for any outstanding stock option or other equity award agreement previously entered into between you and the Company. Changes in your employment terms, other than those changes expressly reserved to the Company's or Board's discretion in this Agreement, require a written modification approved by the Board and signed by a duly authorized member of the Board or the President and Chief Executive Officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This Agreement shall be construed and enforced in accordance with the laws of the State of California without regard to conflicts of law principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in counterparts which shall be deemed to be part of one original, and facsimile signatures shall be equivalent to original signatures.

Please sign and date this Agreement and return it to me as soon as practicable if you wish to accept continued employment at the Company under the terms described above. I would be happy to discuss any questions that you may have about these terms.

The Board looks forward to your favorable reply and to a continued productive and enjoyable work relationship.

Sincerely,

/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President and Chief Executive Officer

Understood and Accepted:

/s/ Jeffrey J. Rudy
Jeffrey J. Rudy

3 September 2013
Date

EXHIBIT A

RELEASE AGREEMENT
(To be signed on or after the Separation Date)

1. Consideration. I understand that my position with Celladon Corporation (the "***Company***") terminated effective _____, 201__ (the "***Separation Date***"). The Company has agreed that if I timely sign, date and return this Release Agreement ("***Release***"), and I do not revoke it, the Company will provide me with certain severance benefits pursuant to the terms and conditions of that certain Letter Agreement between myself and the Company dated _____, 2013 (the "***Employment Agreement***"), and any agreements incorporated therein by reference. I understand that I am not entitled to such severance benefits unless I timely sign this Release and allow it to become effective.

2. General Release. In exchange for the consideration to be provided to me under the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release, acquit and forever discharge the Company and its parent, subsidiary, and affiliated entities, and investors, along with its and their predecessors and successors and their respective directors, officers, employees, shareholders, stockholders, partners, agents, attorneys, insurers, affiliates and assigns (collectively, the "***Released Parties***"), of and from any and all claims, liabilities and obligations, both known and unknown, that arise from or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date that I sign this Release (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: **(a)** all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; **(b)** all claims related to my compensation or benefits from the Company, including salary, bonuses, commissions, other incentive compensation, vacation pay and the redemption thereof, expense reimbursements, fringe benefits, stock, stock options, or any other ownership or equity interests in the Company; **(c)** all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; **(d)** all tort claims, including but not limited to claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and **(e)** all federal, state, and local statutory claims, including but not limited to claims for discrimination, harassment, retaliation, attorneys' fees, penalties, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990 (as amended), the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), the federal Family and Medical Leave Act ("***FMLA***"), the California Labor Code (as amended), and the California Fair Employment and Housing Act (as amended).

3. Excluded Claims. Notwithstanding the foregoing, the following are not included in the Released Claims (the "***Excluded Claims***"): **(a)** any rights or claims for indemnification I may have pursuant to any written indemnification agreement with the Company to which I am a party, the Company's bylaws, or applicable law; and **(b)** any rights which are not waivable as a matter of law. In addition, nothing in this Release prevents me from filing, cooperating with, or participating in any investigation or proceeding before the Equal Employment Opportunity Commission, the Department of Labor, the California Department of Fair Employment and Housing, or any other government agency, except that I hereby waive my right to any monetary benefits in connection with any such claim, charge, investigation or proceeding. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

4. ADEA Waiver. I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA ("***ADEA Waiver***"). I also acknowledge that the consideration given for the ADEA Waiver is in addition to anything of value to which I was already entitled. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: **(a)** my ADEA Waiver does not apply to any rights or claims that arise after the date I sign this Release; **(b)** I should consult with an attorney prior to signing this Release; **(c)** I have twenty-one (21) days to consider this Release (although I may choose to voluntarily sign it sooner); **(d)** I have seven (7) days following the date I sign this Release to revoke the ADEA Waiver; and **(e)** the ADEA Waiver will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth day after I sign this Release.

5. Section 1542 Waiver. In giving the general release herein, which includes claims which may be unknown to me at present, I acknowledge that I have read and understand Section 1542 of the California Civil Code, which reads as follows: **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."** I hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to my release of claims, including but not limited to any unknown or unsuspected claims herein.

6. Other Agreements and Representations. I further agree: **(a)** not to voluntarily (except in response to legal compulsion) assist any third party in bringing or pursuing any proposed or pending litigation, arbitration, administrative claim or other formal proceeding against the Company, its parent or subsidiary entities, investors, affiliates, officers, directors, employees or agents; **(b)** to cooperate fully with the Company, by voluntarily (without legal compulsion) providing accurate and complete information, in connection with the Company's actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or other matters, arising from events, acts, or failures to act that occurred during the period of my employment by the Company; and **(c)** I hereby acknowledge and reaffirm my continuing obligations under the terms of my Confidential Information Agreement (as defined in the Employment Agreement). In addition, I hereby represent that I have received all the leave and leave benefits and protections for which I am eligible, pursuant to FMLA, the California Family Rights Act, or any applicable law or Company policy, and I have not suffered any on-the-job injury for which I have not already filed a workers' compensation claim.

This Release, together with the Confidential Information Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release may only be modified by a writing signed by both me and a duly authorized officer of the Company.

UNDERSTOOD AND AGREED:

_____

JEFFREY J. RUDY

Date: _____

Exhibit 10.8

August 31, 2013

Rebecque Laba

Re: Employment Terms

Dear Rebecque:

On behalf of Celladon Corporation (the "***Company***"), I am pleased to offer you continued employment at the Company on the terms set forth in this letter agreement (the "***Agreement***"). Subject to your acceptance by signing below, this Agreement will become effective upon the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Company's common stock, pursuant to which such common stock is priced for the initial public offering (the "***Effective Date***"). As of the Effective Date, this Agreement replaces and supersedes in its entirety the letter agreement between you and the Company dated September 24, 2007, as amended in April 2012 (the "***Prior Agreement***"), as provided in Section 12 below.

1. Employment Position and Duties

You will continue to be employed as the Company's Vice President, Finance & Administration and you will report to the President and Chief Executive Officer of the Company. You shall perform the duties of such position as are customary, as specified in the Bylaws of the Company, and as may be required by the President and Chief Executive Officer of the Company or the Board of Directors of the Company (or any authorized committee thereof) (the "***Board***").

During your employment with the Company, you will devote your full-time best efforts and business time and attention to the business of the Company. Your employment relationship with the Company shall also be governed by the general employment policies and practices of the Company (except that if the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices, this Agreement will control), and you will be required to abide by the general employment policies and practices of the Company. The Company reserves the right to change your position, duties, reporting relationship, work location, and the Company's general employment policies and procedures, from time to time in its discretion.

2. Base Salary and Employee Benefits

Your base salary will be paid at the rate of $20,833.33 per month (an annual rate of $250,000), less payroll deductions and withholdings. You will be paid your base salary on a semi-monthly basis, on the Company's normal payroll schedule. As an exempt salaried employee, you will be required to work the Company's normal business hours, and such additional time as appropriate for your work assignments and positions. You will not be eligible for overtime premiums.

As a regular, full-time employee, you will be eligible to participate in the Company's standard employee benefits, pursuant to the terms and conditions of the benefit plans and the applicable Company policies. Subject to change, the Company currently provides group medical, dental and vision care insurance, a life, AD&D, long-term and short-term disability insurance program, a life insurance cash subsidy, a

health reimbursement arrangement and a 401(k) plan. The Company may change its compensation and benefits from time to time in its discretion. In addition to the Company's annual holiday schedule, you will accrue at a rate of 15 days per year of paid time off, including both vacation and sick leave, subject to a maximum accrual of 240 hours. This allowance is subject to the Company's policies with respect to accrual of, including limitations on the maximum permitted accrual of, paid time off and is subject to change in accordance with changes in Company policy.

3. Annual Performance Bonus

As Vice President, Finance & Administration, you will be eligible to earn an annual performance bonus (including for the full year in which this Agreement becomes effective) pursuant to the Company's annual incentive bonus plan, with the target amount of such bonus equal to thirty percent (30%) of your annual base salary. The bonus, if any, will be based upon the Board's assessment of your performance and the Company's attainment of targeted goals as set by the Board in its sole discretion. Bonus payments, if any, will be subject to applicable payroll deductions and withholdings. Following the close of each calendar year, the Board will determine whether you have earned a performance bonus, and the amount of any performance bonus, based on the set criteria. No amount of the annual bonus is guaranteed, and you must be an employee in good standing through the end of the applicable bonus determination period to earn and be eligible to receive a bonus; no partial or prorated bonuses will be provided (except as provided in Section 6 below). In all events, any earned bonus will be paid not later than March 15 of the year following the year in which your right to such amount became vested. Your base salary and bonus eligibility will be reviewed on an annual or more frequent basis by the Board, and are subject to change in the discretion of the Board. For the avoidance of doubt, all references in this agreement to the Board shall include any authorized committee of the Board.

4. Stock Options and Employee Stock Purchase Plan

You will be eligible to participate in and receive stock option or equity award grants under the Company's equity incentive plans from time to time in the discretion of the Board, and in accordance with the terms and conditions of such plans. Any stock options or other equity awards that you have been granted by the Company prior to the Effective Date will continue to be governed in all respects by the terms of the applicable grant notices, award agreements and plan documents.

In addition, we expect to adopt an employee stock purchase plan that will become effective upon the Effective Date. You will be eligible to participate in our employee stock purchase plan and purchase our common stock at a discount.

5. At-Will Employment Relationship

Your employment relationship is at will. You may terminate your employment with the Company at any time and for any reason whatsoever simply by notifying the Company. Likewise, the Company may terminate your employment at any time, with or without Cause (as defined below), and with or without advance notice. Your employment at-will status can only be modified in a written agreement approved by the Board and signed by you and a duly authorized member of the Board.

6. Severance Benefits.

In the event your employment with the Company is terminated for any reason, you will be entitled to all of your earned compensation and benefits or otherwise as required by law through the date of termination (the "***Accrued Amounts***"). For the avoidance of doubt, you shall not be entitled to any additional

compensation or benefits in the event your employment is terminated for Cause, due to your resignation without Good Reason, upon your death or upon your disability. If your employment terminates due to an Involuntary Termination (as defined below), you will be eligible to receive the additional compensation and benefits described in Section 6(a) and 6(b).

(a) Involuntary Termination other than in Connection with a Change in Control. If at any time (i) the Company terminates your employment without Cause (as defined below and other than as a result of your death or disability), or (ii) you resign for Good Reason (as defined below), and provided in any case such termination constitutes a "separation from service", as defined under Treasury Regulation Section 1.409A-1(h)) (a "***Separation from Service***") (such termination described in (i) or (ii), an "***Involuntary Termination***"), you shall be entitled to receive the following severance benefits, subject in all events to your compliance with Section 6(c) below:

(i) You shall receive severance pay in the form of continuation of your base salary in effect (ignoring any decrease that forms the basis for your resignation for Good Reason, if applicable) on the effective date of your Involuntary Termination for the first nine (9) months (the "***Severance Period***") after the date of such termination; and

(ii) If you are eligible for and timely elect to continue your health insurance coverage under the Company's group health plans under the Consolidated Omnibus Budget Reconciliation Act of 1985 or the state equivalent ("***COBRA***") following your termination date, the Company will pay the COBRA group health insurance premiums for you and your eligible dependents until the earliest of (A) the close of the Severance Period, (B) the expiration of your eligibility for the continuation coverage under COBRA, or (C) the date when you become eligible for substantially equivalent health insurance coverage in connection with new employment or self-employment. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by you under a Section 125 health care reimbursement plan under the U.S. Internal Revenue Code. Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether you elect continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay you on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to the COBRA premiums for that month, subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be equal to the amount that the Company would have otherwise paid for COBRA premiums, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date you voluntarily enroll in a health insurance plan offered by another employer or entity.

(b) Involuntary Termination in Connection with a Change in Control. In the event that your Involuntary Termination occurs within the three (3) months prior to, or twelve (12) months following the consummation of a Change in Control and subject in all events to your compliance with Section 6(c) below, then you shall be entitled to the benefits provided above in Section 6(a), except that:

(i) The Severance Period for purposes of continued salary and COBRA benefits shall be twelve (12) months, rather than nine (9) months; you shall receive a lump sum payment of your target bonus for the year of termination; and in addition,

(ii) The vesting of all of your outstanding stock options and other equity awards that are subject to time-based vesting requirements shall accelerate in full such that all such equity awards shall be deemed fully vested as of the date of your Involuntary Termination.

(c) Conditions and Timing for Severance Benefits. The severance benefits set forth in Sections 6(a) and 6(b) above are expressly conditioned upon: (i) your continuing to comply with your obligations under your Confidential Information Agreement (as defined in Section 8 below); and (ii) you signing and not revoking a general release of legal claims in the form attached hereto as **EXHIBIT A** or a substantially similar form provided that, for the avoidance of doubt, such form will include a commitment from you to comply with your continuing obligations under your Confidential Information Agreement, but will not include a noncompetition provision and will not include a release of any rights or claims for indemnification you may have pursuant to any written indemnification agreement with the Company to which you are a party, the Company's bylaws, or applicable law (the "Release") within the applicable deadline set forth therein and permitting the Release to become effective in accordance with its terms, which must occur no later than the Release Deadline (as defined in Section 7 below). The salary continuation payments described in Sections 6(a) and 6(b) will be paid in substantially equal installments on the Company's regular payroll schedule and subject to standard deductions and withholdings over the Severance Period following termination; *provided, however,* that no payments will be made prior to the effectiveness of the Release. On the effective date of the Release, the Company will pay you the salary continuation payments that you would have received on or prior to such date in a lump sum under the original schedule but for the delay while waiting for the effectiveness of the release, with the balance of the cash severance being paid as originally scheduled. Bonus payments described in Section 6(b) will be paid in a lump sum cash payment, subject to standard deductions and withholdings on the effective date of the Release.

(d) Definitions. For purposes of this Agreement:

(i) "***Cause***" means the occurrence of any of the following events, conditions or actions: (1) your conviction of any felony or your conviction of any crime involving fraud or dishonesty; (2) your participation (whether by affirmative act or omission) in any material fraud, material act of dishonesty or other material act of misconduct against the Company; (3) your willful and habitual neglect of your duties, provided you have been given written notice of such neglect and, if curable, a reasonable opportunity to cure, not to exceed thirty (30) days; (4) your material violation of any fiduciary duty or duty of loyalty owed to the Company; (5) your breach of any material term of any material contract between you and the Company which has a material adverse effect on the Company; (6) your knowing violation of any material Company policy which has a material adverse effect on the Company; or (7) your knowing violation of state or federal law in connection with the performance of your job which has a material adverse effect on the Company.

(ii) "***Change in Control***" shall have the meaning set forth in the Company's 2013 Equity Incentive Plan.

(iii) "***Good Reason***" means your resignation from employment with the Company (or successor to the Company, if applicable) due to any of the following actions taken by the Company (or successor to the Company, if applicable) without your prior written consent thereto: (1) a material reduction in your base salary, which the parties agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated employees); (2) a material reduction in your authority, duties or responsibilities; (3) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report, including a requirement that you report to a corporate officer or employee instead of reporting directly to the Board;

(4) a relocation of your principal place of employment to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (4) shall not apply. *Notwithstanding the foregoing*, in order to resign for Good Reason, you must (i) provide written notice to the Company within thirty (30) days after the first occurrence of the event giving rise to Good Reason setting forth the basis for your resignation, (ii) allow the Company at least sixty (60) days from receipt of such written notice to cure such event, and (iii) if such event is not reasonably cured within such period, your resignation from all positions you then hold with the Company is effective not later than thirty (30) days after the expiration of the cure period.

7. Tax Provisions.

(a) Section 409A. Notwithstanding anything in this Agreement to the contrary, the following provisions apply to the extent severance benefits provided herein are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the ***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***). Severance benefits shall not commence until you have a Separation from Service. Each installment of severance benefits is a separate "payment" for purposes of Treasury Regulations Section 1.409A-2(b)(2)(i), and the severance benefits are intended to satisfy the exemptions from application of Section 409A provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A-1(b)(9). However, if such exemptions are not available and you are, upon Separation from Service, a "specified employee" for purposes of Section 409A, then, solely to the extent necessary to avoid adverse personal tax consequences under Section 409A, the timing of the severance benefits payments shall be delayed until the earlier of (i) six (6) months and one day after your Separation from Service, or (ii) your death.

You shall receive severance benefits only if you execute and return to the Company the Release within the applicable time period set forth therein and permit such Release to become effective in accordance with its terms, which date may not be later than sixty (60) days following the date of your Separation from Service (such latest permitted date, the ***"Release Deadline"***). If the severance benefits are not covered by one or more exemptions from the application of Section 409A and the Release could become effective in the calendar year following the calendar year in which your Separation from Service occurs, the Release will not be deemed effective any earlier than the Release Deadline. None of the severance benefits will be paid or otherwise delivered prior to the effective date of the Release. Except to the minimum extent that payments must be delayed because you are a "specified employee" or until the effectiveness of the Release, all amounts will be paid as soon as practicable in accordance with the schedule provided herein and in accordance with the Company's normal payroll practices.

The severance benefits are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences under Section 409A, and any ambiguities herein shall be interpreted accordingly.

(b) Section 280G. If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment pursuant to this Agreement or otherwise (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account

all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 7(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 7(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 7(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

8. Compliance With Employee Confidentiality and Inventions Assignment and Company Policies

As a condition of employment, you will be required to continue to comply with the Company's Employee Confidentiality and Inventions Assignment that you executed on September 17, 2007, as may be amended by you and the Company from time to time (the "***Confidential Information Agreement***"), which prohibits unauthorized use or disclosure of the Company's proprietary information, among other

obligations. In addition, you will be expected to abide by the Company's rules and policies, as may be changed from time to time within the Company's sole discretion.

9. Protection of Third Party Information

In your work for the Company, you are expected not to use or disclose any confidential information, including trade secrets, of any former employer or other person to whom you have an obligation of confidentiality. Rather, you are expected to use only that information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. You agree that you will not bring onto Company premises, or use in the performance of your duties, any unpublished documents or property belonging to any former employer or other person to whom you have an obligation of confidentiality. You hereby represent that you have disclosed to the Company any contract you have signed that may restrict your activities on behalf of the Company.

10. Outside Activities

Throughout your employment with the Company, you may engage in civic and not-for-profit activities so long as such activities do not interfere with the performance of your duties hereunder or present a conflict of interest with the Company. Subject to the restrictions set forth herein and with the prior written consent of the Board, you may serve as a director of other corporations and may devote a reasonable amount of your time to other types of business or public activities not expressly mentioned in this paragraph. The Board may rescind its consent to your service as a director of all other corporations or participation in other business or public activities, if the Board, in its sole discretion, determines that such activities compromise or threaten to compromise the Company's business interests or conflict with your duties to the Company.

During your employment by the Company, except on behalf of the Company, you will not directly or indirectly serve as an officer, director, stockholder, employee, partner, proprietor, investor, joint venture, associate, representative or consultant of any other person, corporation, firm, partnership or other entity whatsoever that competes with the Company (or is planning or preparing to compete with the Company), anywhere in the world, in any line of business engaged in (or planned to be engaged in) by the Company; provided, however, that you may purchase or otherwise acquire up to (but not more than) one percent (1%) of any class of securities of any enterprise (but without participating in the activities of such enterprise) if such securities are listed on any national or regional securities exchange.

11. Dispute Resolution

To ensure the rapid and economical resolution of disputes that may arise in connection with your employment with the Company, you and the Company agree that any and all disputes, claims, or causes of action, in law or equity, including but not limited to statutory claims, arising from or relating to the enforcement, breach, performance, or interpretation of this Agreement, your employment with the Company, or the termination of your employment from the Company, shall be resolved, to the fullest extent permitted by law, by final, binding and confidential arbitration conducted before a single arbitrator by JAMS, Inc ("***JAMS***") or its successor, under JAMS' then applicable rules and procedures for employment disputes (which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you on request). The arbitration shall take place in the county (or comparable governmental unit) in which you were last employed by the Company, as determined by the arbitrator; provided that if the arbitrator determines there will be an undue hardship to you to have the arbitration in such location, the arbitrator will choose an alternative appropriate location. You and the Company each acknowledge

that by agreeing to this arbitration procedure, you waive the right to resolve any such dispute through a trial by jury or judge or administrative proceeding. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator, and not a court, shall also be authorized to determine whether the provisions of this section apply to a dispute, controversy, or claim sought to be resolved in accordance with these arbitration procedures. The Company shall pay all arbitration fees and costs in excess of the administrative fees that you would be required to incur if the dispute were filed or decided in a court of law. Nothing in this Agreement is intended to prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration.

12. Miscellaneous

This Agreement, together with your Confidential Information Agreement, forms the complete and exclusive statement of your employment agreement with the Company. It supersedes the Prior Agreement and any other agreements or promises made to you by anyone, whether oral or written, except for any outstanding stock option or other equity award agreement previously entered into between you and the Company. Changes in your employment terms, other than those changes expressly reserved to the Company's or Board's discretion in this Agreement, require a written modification approved by the Board and signed by a duly authorized member of the Board or the President and Chief Executive Officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This Agreement shall be construed and enforced in accordance with the laws of the State of California without regard to conflicts of law principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in counterparts which shall be deemed to be part of one original, and facsimile signatures shall be equivalent to original signatures.

Please sign and date this Agreement and return it to me as soon as practicable if you wish to accept continued employment at the Company under the terms described above. I would be happy to discuss any questions that you may have about these terms.

The Board looks forward to your favorable reply and to a continued productive and enjoyable work relationship.

Sincerely,

/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President and Chief Executive Officer

Understood and Accepted:

/s/ Rebecque Laba
Rebecque Laba

9/3/13
Date

EXHIBIT A

RELEASE AGREEMENT
(To be signed on or after the Separation Date)

1. Consideration. I understand that my position with Celladon Corporation (the "***Company***") terminated effective _____, 201__ (the "***Separation Date***"). The Company has agreed that if I timely sign, date and return this Release Agreement ("***Release***"), and I do not revoke it, the Company will provide me with certain severance benefits pursuant to the terms and conditions of that certain Letter Agreement between myself and the Company dated _____, 2013 (the "***Employment Agreement***"), and any agreements incorporated therein by reference. I understand that I am not entitled to such severance benefits unless I timely sign this Release and allow it to become effective.

2. General Release. In exchange for the consideration to be provided to me under the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release, acquit and forever discharge the Company and its parent, subsidiary, and affiliated entities, and investors, along with its and their predecessors and successors and their respective directors, officers, employees, shareholders, stockholders, partners, agents, attorneys, insurers, affiliates and assigns (collectively, the "***Released Parties***"), of and from any and all claims, liabilities and obligations, both known and unknown, that arise from or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date that I sign this Release (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: **(a)** all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; **(b)** all claims related to my compensation or benefits from the Company, including salary, bonuses, commissions, other incentive compensation, vacation pay and the redemption thereof, expense reimbursements, fringe benefits, stock, stock options, or any other ownership or equity interests in the Company; **(c)** all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; **(d)** all tort claims, including but not limited to claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and **(e)** all federal, state, and local statutory claims, including but not limited to claims for discrimination, harassment, retaliation, attorneys' fees, penalties, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990 (as amended), the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), the federal Family and Medical Leave Act ("***FMLA***"), the California Labor Code (as amended), and the California Fair Employment and Housing Act (as amended).

3. Excluded Claims. Notwithstanding the foregoing, the following are not included in the Released Claims (the "***Excluded Claims***"): **(a)** any rights or claims for indemnification I may have pursuant to any written indemnification agreement with the Company to which I am a party, the Company's bylaws, or applicable law; and **(b)** any rights which are not waivable as a matter of law. In addition, nothing in this Release prevents me from filing, cooperating with, or participating in any investigation or proceeding before the Equal Employment Opportunity Commission, the Department of Labor, the California Department of Fair Employment and Housing, or any other government agency, except that I hereby waive my right to any monetary benefits in connection with any such claim, charge, investigation or proceeding. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

4. ADEA Waiver. I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA ("***ADEA Waiver***"). I also acknowledge that the consideration given for the ADEA Waiver is in addition to anything of value to which I was already entitled. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: **(a)** my ADEA Waiver does not apply to any rights or claims that arise after the date I sign this Release; **(b)** I should consult with an attorney prior to signing this Release; **(c)** I have twenty-one (21) days to consider this Release (although I may choose to voluntarily sign it sooner); **(d)** I have seven (7) days following the date I sign this Release to revoke the ADEA Waiver; and **(e)** the ADEA Waiver will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth day after I sign this Release.

5. Section 1542 Waiver. In giving the general release herein, which includes claims which may be unknown to me at present, I acknowledge that I have read and understand Section 1542 of the California Civil Code, which reads as follows: **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."** I hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to my release of claims, including but not limited to any unknown or unsuspected claims herein.

6. Other Agreements and Representations. I further agree: **(a)** not to voluntarily (except in response to legal compulsion) assist any third party in bringing or pursuing any proposed or pending litigation, arbitration, administrative claim or other formal proceeding against the Company, its parent or subsidiary entities, investors, affiliates, officers, directors, employees or agents; **(b)** to cooperate fully with the Company, by voluntarily (without legal compulsion) providing accurate and complete information, in connection with the Company's actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or other matters, arising from events, acts, or failures to act that occurred during the period of my employment by the Company; and **(c)** I hereby acknowledge and reaffirm my continuing obligations under the terms of my Confidential Information Agreement (as defined in the Employment Agreement). In addition, I hereby represent that I have received all the leave and leave benefits and protections for which I am eligible, pursuant to FMLA, the California Family Rights Act, or any applicable law or Company policy, and I have not suffered any on-the-job injury for which I have not already filed a workers' compensation claim.

This Release, together with the Confidential Information Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release may only be modified by a writing signed by both me and a duly authorized officer of the Company.

UNDERSTOOD AND AGREED:

_____

REBECQUE LABA

Date: _____

Exhibit 10.9

August 31, 2013

Ryan K. Takeya

Re: Employment Terms

Dear Ryan:

On behalf of Celladon Corporation (the "***Company***"), I am pleased to offer you continued employment at the Company on the terms set forth in this letter agreement (the "***Agreement***"). Subject to your acceptance by signing below, this Agreement will become effective upon the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Company's common stock, pursuant to which such common stock is priced for the initial public offering (the "***Effective Date***"). As of the Effective Date, this Agreement replaces and supersedes in its entirety the letter agreement between you and the Company dated January 30, 2012 (the "***Prior Agreement***"), as provided in Section 12 below.

1. Employment Position and Duties

You will continue to be employed as the Company's Vice President, Manufacturing and you will report to the President and Chief Executive Officer of the Company. You shall perform the duties of such position as are customary, as specified in the Bylaws of the Company, and as may be required by the President and Chief Executive Officer of the Company or the Board of Directors of the Company (or any authorized committee thereof) (the "***Board***").

During your employment with the Company, you will devote your full-time best efforts and business time and attention to the business of the Company. Your employment relationship with the Company shall also be governed by the general employment policies and practices of the Company (except that if the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices, this Agreement will control), and you will be required to abide by the general employment policies and practices of the Company. The Company reserves the right to change your position, duties, reporting relationship, work location, and the Company's general employment policies and procedures, from time to time in its discretion.

2. Base Salary and Employee Benefits

Your base salary will be paid at the rate of $18,166.66 per month (an annual rate of $218,000), less payroll deductions and withholdings. You will be paid your base salary on a semi-monthly basis, on the Company's normal payroll schedule. As an exempt salaried employee, you will be required to work the Company's normal business hours, and such additional time as appropriate for your work assignments and positions. You will not be eligible for overtime premiums.

As a regular, full-time employee, you will be eligible to participate in the Company's standard employee benefits, pursuant to the terms and conditions of the benefit plans and the applicable Company policies. Subject to change, the Company currently provides group medical, dental and vision care insurance, a life, AD&D, long-term and short-term disability insurance program, a life insurance cash subsidy, a

health reimbursement arrangement and a 401(k) plan. The Company may change its compensation and benefits from time to time in its discretion. In addition to the Company's annual holiday schedule, you will accrue at a rate of 15 days per year of paid time off, including both vacation and sick leave, subject to a maximum accrual of 240 hours. This allowance is subject to the Company's policies with respect to accrual of, including limitations on the maximum permitted accrual of, paid time off and is subject to change in accordance with changes in Company policy.

3. Annual Performance Bonus

As Vice President, Manufacturing, you will be eligible to earn an annual performance bonus (including for the full year in which this Agreement becomes effective) pursuant to the Company's annual incentive bonus plan, with the target amount of such bonus equal to thirty percent (30%) of your annual base salary. The bonus, if any, will be based upon the Board's assessment of your performance and the Company's attainment of targeted goals as set by the Board in its sole discretion. Bonus payments, if any, will be subject to applicable payroll deductions and withholdings. Following the close of each calendar year, the Board will determine whether you have earned a performance bonus, and the amount of any performance bonus, based on the set criteria. No amount of the annual bonus is guaranteed, and you must be an employee in good standing through the end of the applicable bonus determination period to earn and be eligible to receive a bonus; no partial or prorated bonuses will be provided (except as provided in Section 6 below). In all events, any earned bonus will be paid not later than March 15 of the year following the year in which your right to such amount became vested. Your base salary and bonus eligibility will be reviewed on an annual or more frequent basis by the Board, and are subject to change in the discretion of the Board. For the avoidance of doubt, all references in this agreement to the Board shall include any authorized committee of the Board.

4. Stock Options and Employee Stock Purchase Plan

You will be eligible to participate in and receive stock option or equity award grants under the Company's equity incentive plans from time to time in the discretion of the Board, and in accordance with the terms and conditions of such plans. Any stock options or other equity awards that you have been granted by the Company prior to the Effective Date will continue to be governed in all respects by the terms of the applicable grant notices, award agreements and plan documents.

In addition, we expect to adopt an employee stock purchase plan that will become effective upon the Effective Date. You will be eligible to participate in our employee stock purchase plan and purchase our common stock at a discount.

5. At-Will Employment Relationship

Your employment relationship is at will. You may terminate your employment with the Company at any time and for any reason whatsoever simply by notifying the Company. Likewise, the Company may terminate your employment at any time, with or without Cause (as defined below), and with or without advance notice. Your employment at-will status can only be modified in a written agreement approved by the Board and signed by you and a duly authorized member of the Board.

6. Severance Benefits.

In the event your employment with the Company is terminated for any reason, you will be entitled to all of your earned compensation and benefits or otherwise as required by law through the date of termination (the "***Accrued Amounts***"). For the avoidance of doubt, you shall not be entitled to any additional

compensation or benefits in the event your employment is terminated for Cause, due to your resignation without Good Reason, upon your death or upon your disability. If your employment terminates due to an Involuntary Termination (as defined below), you will be eligible to receive the additional compensation and benefits described in Section 6(a) and 6(b).

(a) Involuntary Termination other than in Connection with a Change in Control. If at any time (i) the Company terminates your employment without Cause (as defined below and other than as a result of your death or disability), or (ii) you resign for Good Reason (as defined below), and provided in any case such termination constitutes a "separation from service", as defined under Treasury Regulation Section 1.409A-1(h)) (a "***Separation from Service***") (such termination described in (i) or (ii), an "***Involuntary Termination***"), you shall be entitled to receive the following severance benefits, subject in all events to your compliance with Section 6(c) below:

(i) You shall receive severance pay in the form of continuation of your base salary in effect (ignoring any decrease that forms the basis for your resignation for Good Reason, if applicable) on the effective date of your Involuntary Termination for the first nine (9) months (the "***Severance Period***") after the date of such termination; and

(ii) If you are eligible for and timely elect to continue your health insurance coverage under the Company's group health plans under the Consolidated Omnibus Budget Reconciliation Act of 1985 or the state equivalent ("***COBRA***") following your termination date, the Company will pay the COBRA group health insurance premiums for you and your eligible dependents until the earliest of (A) the close of the Severance Period, (B) the expiration of your eligibility for the continuation coverage under COBRA, or (C) the date when you become eligible for substantially equivalent health insurance coverage in connection with new employment or self-employment. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by you under a Section 125 health care reimbursement plan under the U.S. Internal Revenue Code. Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether you elect continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay you on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to the COBRA premiums for that month, subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be equal to the amount that the Company would have otherwise paid for COBRA premiums, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date you voluntarily enroll in a health insurance plan offered by another employer or entity.

(b) Involuntary Termination in Connection with a Change in Control. In the event that your Involuntary Termination occurs within the three (3) months prior to, or twelve (12) months following the consummation of a Change in Control and subject in all events to your compliance with Section 6(c) below, then you shall be entitled to the benefits provided above in Section 6(a), except that:

(i) The Severance Period for purposes of continued salary and COBRA benefits shall be twelve (12) months, rather than nine (9) months; you shall receive a lump sum payment of your target bonus for the year of termination; and in addition,

(ii) The vesting of all of your outstanding stock options and other equity awards that are subject to time-based vesting requirements shall accelerate in full such that all such equity awards shall be deemed fully vested as of the date of your Involuntary Termination.

(c) Conditions and Timing for Severance Benefits. The severance benefits set forth in Sections 6(a) and 6(b) above are expressly conditioned upon: (i) your continuing to comply with your obligations under your Confidential Information Agreement (as defined in Section 8 below); and (ii) you signing and not revoking a general release of legal claims in the form attached hereto as **EXHIBIT A** or a substantially similar form provided that, for the avoidance of doubt, such form will include a commitment from you to comply with your continuing obligations under your Confidential Information Agreement, but will not include a noncompetition provision and will not include a release of any rights or claims for indemnification you may have pursuant to any written indemnification agreement with the Company to which you are a party, the Company's bylaws, or applicable law (the "***Release***") within the applicable deadline set forth therein and permitting the Release to become effective in accordance with its terms, which must occur no later than the Release Deadline (as defined in Section 7 below). The salary continuation payments described in Sections 6(a) and 6(b) will be paid in substantially equal installments on the Company's regular payroll schedule and subject to standard deductions and withholdings over the Severance Period following termination; *provided, however,* that no payments will be made prior to the effectiveness of the Release. On the effective date of the Release, the Company will pay you the salary continuation payments that you would have received on or prior to such date in a lump sum under the original schedule but for the delay while waiting for the effectiveness of the release, with the balance of the cash severance being paid as originally scheduled. Bonus payments described in Section 6(b) will be paid in a lump sum cash payment, subject to standard deductions and withholdings on the effective date of the Release.

(d) Definitions. For purposes of this Agreement:

(i) "***Cause***" means the occurrence of any of the following events, conditions or actions: (1) your conviction of any felony or your conviction of any crime involving fraud or dishonesty; (2) your participation (whether by affirmative act or omission) in any material fraud, material act of dishonesty or other material act of misconduct against the Company; (3) your willful and habitual neglect of your duties, provided you have been given written notice of such neglect and, if curable, a reasonable opportunity to cure, not to exceed thirty (30) days; (4) your material violation of any fiduciary duty or duty of loyalty owed to the Company; (5) your breach of any material term of any material contract between you and the Company which has a material adverse effect on the Company; (6) your knowing violation of any material Company policy which has a material adverse effect on the Company; or (7) your knowing violation of state or federal law in connection with the performance of your job which has a material adverse effect on the Company.

(ii) "***Change in Control***" shall have the meaning set forth in the Company's 2013 Equity Incentive Plan.

(iii) "***Good Reason***" means your resignation from employment with the Company (or successor to the Company, if applicable) due to any of the following actions taken by the Company (or successor to the Company, if applicable) without your prior written consent thereto: (1) a material reduction in your base salary, which the parties agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated employees); (2) a material reduction in your authority, duties or responsibilities; (3) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report, including a requirement that you report to a corporate officer or employee instead of reporting directly to the Board;

(4) a relocation of your principal place of employment to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (4) shall not apply. *Notwithstanding the foregoing*, in order to resign for Good Reason, you must (i) provide written notice to the Company within thirty (30) days after the first occurrence of the event giving rise to Good Reason setting forth the basis for your resignation, (ii) allow the Company at least sixty (60) days from receipt of such written notice to cure such event, and (iii) if such event is not reasonably cured within such period, your resignation from all positions you then hold with the Company is effective not later than thirty (30) days after the expiration of the cure period.

7. Tax Provisions.

(a) Section 409A. Notwithstanding anything in this Agreement to the contrary, the following provisions apply to the extent severance benefits provided herein are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the ***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***). Severance benefits shall not commence until you have a Separation from Service. Each installment of severance benefits is a separate "payment" for purposes of Treasury Regulations Section 1.409A-2(b)(2)(i), and the severance benefits are intended to satisfy the exemptions from application of Section 409A provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A-1(b)(9). However, if such exemptions are not available and you are, upon Separation from Service, a "specified employee" for purposes of Section 409A, then, solely to the extent necessary to avoid adverse personal tax consequences under Section 409A, the timing of the severance benefits payments shall be delayed until the earlier of (i) six (6) months and one day after your Separation from Service, or (ii) your death.

You shall receive severance benefits only if you execute and return to the Company the Release within the applicable time period set forth therein and permit such Release to become effective in accordance with its terms, which date may not be later than sixty (60) days following the date of your Separation from Service (such latest permitted date, the ***"Release Deadline"***). If the severance benefits are not covered by one or more exemptions from the application of Section 409A and the Release could become effective in the calendar year following the calendar year in which your Separation from Service occurs, the Release will not be deemed effective any earlier than the Release Deadline. None of the severance benefits will be paid or otherwise delivered prior to the effective date of the Release. Except to the minimum extent that payments must be delayed because you are a "specified employee" or until the effectiveness of the Release, all amounts will be paid as soon as practicable in accordance with the schedule provided herein and in accordance with the Company's normal payroll practices.

The severance benefits are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences under Section 409A, and any ambiguities herein shall be interpreted accordingly.

(b) Section 280G. If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment pursuant to this Agreement or otherwise (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account

all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 7(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 7(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 7(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

8. Compliance With Employee Confidentiality and Inventions Assignment and Company Policies

As a condition of employment, you will be required to continue to comply with the Company's Employee Confidentiality and Inventions Assignment that you executed on April 13, 2012, as may be amended by you and the Company from time to time (the "***Confidential Information Agreement***"), which prohibits unauthorized use or disclosure of the Company's proprietary information, among other obligations. In

addition, you will be expected to abide by the Company's rules and policies, as may be changed from time to time within the Company's sole discretion.

9. Protection of Third Party Information

In your work for the Company, you are expected not to use or disclose any confidential information, including trade secrets, of any former employer or other person to whom you have an obligation of confidentiality. Rather, you are expected to use only that information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. You agree that you will not bring onto Company premises, or use in the performance of your duties, any unpublished documents or property belonging to any former employer or other person to whom you have an obligation of confidentiality. You hereby represent that you have disclosed to the Company any contract you have signed that may restrict your activities on behalf of the Company.

10. Outside Activities

Throughout your employment with the Company, you may engage in civic and not-for-profit activities so long as such activities do not interfere with the performance of your duties hereunder or present a conflict of interest with the Company. Subject to the restrictions set forth herein and with the prior written consent of the Board, you may serve as a director of other corporations and may devote a reasonable amount of your time to other types of business or public activities not expressly mentioned in this paragraph. The Board may rescind its consent to your service as a director of all other corporations or participation in other business or public activities, if the Board, in its sole discretion, determines that such activities compromise or threaten to compromise the Company's business interests or conflict with your duties to the Company.

During your employment by the Company, except on behalf of the Company, you will not directly or indirectly serve as an officer, director, stockholder, employee, partner, proprietor, investor, joint venture, associate, representative or consultant of any other person, corporation, firm, partnership or other entity whatsoever that competes with the Company (or is planning or preparing to compete with the Company), anywhere in the world, in any line of business engaged in (or planned to be engaged in) by the Company; provided, however, that you may purchase or otherwise acquire up to (but not more than) one percent (1%) of any class of securities of any enterprise (but without participating in the activities of such enterprise) if such securities are listed on any national or regional securities exchange.

11. Dispute Resolution

To ensure the rapid and economical resolution of disputes that may arise in connection with your employment with the Company, you and the Company agree that any and all disputes, claims, or causes of action, in law or equity, including but not limited to statutory claims, arising from or relating to the enforcement, breach, performance, or interpretation of this Agreement, your employment with the Company, or the termination of your employment from the Company, shall be resolved, to the fullest extent permitted by law, by final, binding and confidential arbitration conducted before a single arbitrator by JAMS, Inc ("***JAMS***") or its successor, under JAMS' then applicable rules and procedures for employment disputes (which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you on request). The arbitration shall take place in the county (or comparable governmental unit) in which you were last employed by the Company, as determined by the arbitrator; provided that if the arbitrator determines there will be an undue hardship to you to have the arbitration in such location, the arbitrator will choose an alternative appropriate location. You and the Company each acknowledge

that by agreeing to this arbitration procedure, you waive the right to resolve any such dispute through a trial by jury or judge or administrative proceeding. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator, and not a court, shall also be authorized to determine whether the provisions of this section apply to a dispute, controversy, or claim sought to be resolved in accordance with these arbitration procedures. The Company shall pay all arbitration fees and costs in excess of the administrative fees that you would be required to incur if the dispute were filed or decided in a court of law. Nothing in this Agreement is intended to prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration.

12. Miscellaneous

This Agreement, together with your Confidential Information Agreement, forms the complete and exclusive statement of your employment agreement with the Company. It supersedes the Prior Agreement and any other agreements or promises made to you by anyone, whether oral or written, except for any outstanding stock option or other equity award agreement previously entered into between you and the Company. Changes in your employment terms, other than those changes expressly reserved to the Company's or Board's discretion in this Agreement, require a written modification approved by the Board and signed by a duly authorized member of the Board or the President and Chief Executive Officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This Agreement shall be construed and enforced in accordance with the laws of the State of California without regard to conflicts of law principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in counterparts which shall be deemed to be part of one original, and facsimile signatures shall be equivalent to original signatures.

Please sign and date this Agreement and return it to me as soon as practicable if you wish to accept continued employment at the Company under the terms described above. I would be happy to discuss any questions that you may have about these terms.

The Board looks forward to your favorable reply and to a continued productive and enjoyable work relationship.

Sincerely,

/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President and Chief Executive Officer

Understood and Accepted:

/s/ Ryan K. Takeya
Ryan K. Takeya

02 Sept 2013
Date

EXHIBIT A

RELEASE AGREEMENT
(To be signed on or after the Separation Date)

1. Consideration. I understand that my position with Celladon Corporation (the "***Company***") terminated effective _____, 201__ (the "***Separation Date***"). The Company has agreed that if I timely sign, date and return this Release Agreement ("***Release***"), and I do not revoke it, the Company will provide me with certain severance benefits pursuant to the terms and conditions of that certain Letter Agreement between myself and the Company dated _____, 2013 (the "***Employment Agreement***"), and any agreements incorporated therein by reference. I understand that I am not entitled to such severance benefits unless I timely sign this Release and allow it to become effective.

2. General Release. In exchange for the consideration to be provided to me under the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release, acquit and forever discharge the Company and its parent, subsidiary, and affiliated entities, and investors, along with its and their predecessors and successors and their respective directors, officers, employees, shareholders, stockholders, partners, agents, attorneys, insurers, affiliates and assigns (collectively, the "***Released Parties***"), of and from any and all claims, liabilities and obligations, both known and unknown, that arise from or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date that I sign this Release (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: **(a)** all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; **(b)** all claims related to my compensation or benefits from the Company, including salary, bonuses, commissions, other incentive compensation, vacation pay and the redemption thereof, expense reimbursements, fringe benefits, stock, stock options, or any other ownership or equity interests in the Company; **(c)** all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; **(d)** all tort claims, including but not limited to claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and **(e)** all federal, state, and local statutory claims, including but not limited to claims for discrimination, harassment, retaliation, attorneys' fees, penalties, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990 (as amended), the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), the federal Family and Medical Leave Act ("***FMLA***"), the California Labor Code (as amended), and the California Fair Employment and Housing Act (as amended).

3. Excluded Claims. Notwithstanding the foregoing, the following are not included in the Released Claims (the "***Excluded Claims***"): **(a)** any rights or claims for indemnification I may have pursuant to any written indemnification agreement with the Company to which I am a party, the Company's bylaws, or applicable law; and **(b)** any rights which are not waivable as a matter of law. In addition, nothing in this Release prevents me from filing, cooperating with, or participating in any investigation or proceeding before the Equal Employment Opportunity Commission, the Department of Labor, the California Department of Fair Employment and Housing, or any other government agency, except that I hereby waive my right to any monetary benefits in connection with any such claim, charge, investigation or proceeding. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

4. ADEA Waiver. I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA ("***ADEA Waiver***"). I also acknowledge that the consideration given for the ADEA Waiver is in addition to anything of value to which I was already entitled. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: **(a)** my ADEA Waiver does not apply to any rights or claims that arise after the date I sign this Release; **(b)** I should consult with an attorney prior to signing this Release; **(c)** I have twenty-one (21) days to consider this Release (although I may choose to voluntarily sign it sooner); **(d)** I have seven (7) days following the date I sign this Release to revoke the ADEA Waiver; and **(e)** the ADEA Waiver will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth day after I sign this Release.

5. Section 1542 Waiver. In giving the general release herein, which includes claims which may be unknown to me at present, I acknowledge that I have read and understand Section 1542 of the California Civil Code, which reads as follows: **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."** I hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to my release of claims, including but not limited to any unknown or unsuspected claims herein.

6. Other Agreements and Representations. I further agree: **(a)** not to voluntarily (except in response to legal compulsion) assist any third party in bringing or pursuing any proposed or pending litigation, arbitration, administrative claim or other formal proceeding against the Company, its parent or subsidiary entities, investors, affiliates, officers, directors, employees or agents; **(b)** to cooperate fully with the Company, by voluntarily (without legal compulsion) providing accurate and complete information, in connection with the Company's actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or other matters, arising from events, acts, or failures to act that occurred during the period of my employment by the Company; and **(c)** I hereby acknowledge and reaffirm my continuing obligations under the terms of my Confidential Information Agreement (as defined in the Employment Agreement). In addition, I hereby represent that I have received all the leave and leave benefits and protections for which I am eligible, pursuant to FMLA, the California Family Rights Act, or any applicable law or Company policy, and I have not suffered any on-the-job injury for which I have not already filed a workers' compensation claim.

This Release, together with the Confidential Information Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release may only be modified by a writing signed by both me and a duly authorized officer of the Company.

UNDERSTOOD AND AGREED:

_____

RYAN K. TAKEYA

Date: _____

Exhibit 10.10

August 31, 2013

Fredrik Wiklund

Re: Employment Terms

Dear Fredrik:

On behalf of Celladon Corporation (the "***Company***"), I am pleased to offer you continued employment at the Company on the terms set forth in this letter agreement (the "***Agreement***"). Subject to your acceptance by signing below, this Agreement will become effective upon the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Company's common stock, pursuant to which such common stock is priced for the initial public offering (the "***Effective Date***"). As of the Effective Date, this Agreement replaces and supersedes in its entirety the letter agreement between you and the Company dated March 29, 2012 (the "***Prior Agreement***"), as provided in Section 12 below.

1. Employment Position and Duties

You will continue to be employed as the Company's Vice President, Corporate Development and Investor Relations and you will report to the President and Chief Executive Officer of the Company. You shall perform the duties of such position as are customary, as specified in the Bylaws of the Company, and as may be required by the President and Chief Executive Officer of the Company or the Board of Directors of the Company (or any authorized committee thereof) (the "***Board***").

During your employment with the Company, you will devote your full-time best efforts and business time and attention to the business of the Company. Your employment relationship with the Company shall also be governed by the general employment policies and practices of the Company (except that if the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices, this Agreement will control), and you will be required to abide by the general employment policies and practices of the Company. The Company reserves the right to change your position, duties, reporting relationship, work location, and the Company's general employment policies and procedures, from time to time in its discretion.

2. Base Salary and Employee Benefits

Your base salary will be paid at the rate of $18,333.33 per month (an annual rate of $220,000), less payroll deductions and withholdings. You will be paid your base salary on a semi-monthly basis, on the Company's normal payroll schedule. As an exempt salaried employee, you will be required to work the Company's normal business hours, and such additional time as appropriate for your work assignments and positions. You will not be eligible for overtime premiums.

As a regular, full-time employee, you will be eligible to participate in the Company's standard employee benefits, pursuant to the terms and conditions of the benefit plans and the applicable Company policies. Subject to change, the Company currently provides group medical, dental and vision care insurance, a life, AD&D, long-term and short-term disability insurance program, a life insurance cash subsidy, a

health reimbursement arrangement and a 401(k) plan. The Company may change its compensation and benefits from time to time in its discretion. In addition to the Company's annual holiday schedule, you will accrue at a rate of 15 days per year of paid time off, including both vacation and sick leave, subject to a maximum accrual of 240 hours. This allowance is subject to the Company's policies with respect to accrual of, including limitations on the maximum permitted accrual of, paid time off and is subject to change in accordance with changes in Company policy.

3. Annual Performance Bonus

As Vice President, Corporate Development and Investor Relations, you will be eligible to earn an annual performance bonus (including for the full year in which this Agreement becomes effective) pursuant to the Company's annual incentive bonus plan, with the target amount of such bonus equal to thirty percent (30%) of your annual base salary. The bonus, if any, will be based upon the Board's assessment of your performance and the Company's attainment of targeted goals as set by the Board in its sole discretion. Bonus payments, if any, will be subject to applicable payroll deductions and withholdings. Following the close of each calendar year, the Board will determine whether you have earned a performance bonus, and the amount of any performance bonus, based on the set criteria. No amount of the annual bonus is guaranteed, and you must be an employee in good standing through the end of the applicable bonus determination period to earn and be eligible to receive a bonus; no partial or prorated bonuses will be provided (except as provided in Section 6 below). In all events, any earned bonus will be paid not later than March 15 of the year following the year in which your right to such amount became vested. Your base salary and bonus eligibility will be reviewed on an annual or more frequent basis by the Board, and are subject to change in the discretion of the Board. For the avoidance of doubt, all references in this agreement to the Board shall include any authorized committee of the Board.

4. Stock Options and Employee Stock Purchase Plan

You will be eligible to participate in and receive stock option or equity award grants under the Company's equity incentive plans from time to time in the discretion of the Board, and in accordance with the terms and conditions of such plans. Any stock options or other equity awards that you have been granted by the Company prior to the Effective Date will continue to be governed in all respects by the terms of the applicable grant notices, award agreements and plan documents.

In addition, we expect to adopt an employee stock purchase plan that will become effective upon the Effective Date. You will be eligible to participate in our employee stock purchase plan and purchase our common stock at a discount.

5. At-Will Employment Relationship

Your employment relationship is at will. You may terminate your employment with the Company at any time and for any reason whatsoever simply by notifying the Company. Likewise, the Company may terminate your employment at any time, with or without Cause (as defined below), and with or without advance notice. Your employment at-will status can only be modified in a written agreement approved by the Board and signed by you and a duly authorized member of the Board.

6. Severance Benefits.

In the event your employment with the Company is terminated for any reason, you will be entitled to all of your earned compensation and benefits or otherwise as required by law through the date of termination (the "***Accrued Amounts***"). For the avoidance of doubt, you shall not be entitled to any additional

compensation or benefits in the event your employment is terminated for Cause, due to your resignation without Good Reason, upon your death or upon your disability. If your employment terminates due to an Involuntary Termination (as defined below), you will be eligible to receive the additional compensation and benefits described in Section 6(a) and 6(b).

(a) Involuntary Termination other than in Connection with a Change in Control. If at any time (i) the Company terminates your employment without Cause (as defined below and other than as a result of your death or disability), or (ii) you resign for Good Reason (as defined below), and provided in any case such termination constitutes a "separation from service", as defined under Treasury Regulation Section 1.409A-1(h)) (a "***Separation from Service***") (such termination described in (i) or (ii), an "***Involuntary Termination***"), you shall be entitled to receive the following severance benefits, subject in all events to your compliance with Section 6(c) below:

(i) You shall receive severance pay in the form of continuation of your base salary in effect (ignoring any decrease that forms the basis for your resignation for Good Reason, if applicable) on the effective date of your Involuntary Termination for the first nine (9) months (the "***Severance Period***") after the date of such termination; and

(ii) If you are eligible for and timely elect to continue your health insurance coverage under the Company's group health plans under the Consolidated Omnibus Budget Reconciliation Act of 1985 or the state equivalent ("***COBRA***") following your termination date, the Company will pay the COBRA group health insurance premiums for you and your eligible dependents until the earliest of (A) the close of the Severance Period, (B) the expiration of your eligibility for the continuation coverage under COBRA, or (C) the date when you become eligible for substantially equivalent health insurance coverage in connection with new employment or self-employment. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by you under a Section 125 health care reimbursement plan under the U.S. Internal Revenue Code. Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether you elect continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay you on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to the COBRA premiums for that month, subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be equal to the amount that the Company would have otherwise paid for COBRA premiums, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date you voluntarily enroll in a health insurance plan offered by another employer or entity.

(b) Involuntary Termination in Connection with a Change in Control. In the event that your Involuntary Termination occurs within the three (3) months prior to, or twelve (12) months following the consummation of a Change in Control and subject in all events to your compliance with Section 6(c) below, then you shall be entitled to the benefits provided above in Section 6(a), except that:

(i) The Severance Period for purposes of continued salary and COBRA benefits shall be twelve (12) months, rather than nine (9) months; you shall receive a lump sum payment of your target bonus for the year of termination; and in addition,

(ii) The vesting of all of your outstanding stock options and other equity awards that are subject to time-based vesting requirements shall accelerate in full such that all such equity awards shall be deemed fully vested as of the date of your Involuntary Termination.

(c) Conditions and Timing for Severance Benefits. The severance benefits set forth in Sections 6(a) and 6(b) above are expressly conditioned upon: (i) your continuing to comply with your obligations under your Confidential Information Agreement (as defined in Section 8 below); and (ii) you signing and not revoking a general release of legal claims in the form attached hereto as **EXHIBIT A** or a substantially similar form provided that, for the avoidance of doubt, such form will include a commitment from you to comply with your continuing obligations under your Confidential Information Agreement, but will not include a noncompetition provision and will not include a release of any rights or claims for indemnification you may have pursuant to any written indemnification agreement with the Company to which you are a party, the Company's bylaws, or applicable law (the "***Release***") within the applicable deadline set forth therein and permitting the Release to become effective in accordance with its terms, which must occur no later than the Release Deadline (as defined in Section 7 below). The salary continuation payments described in Section 6(a) and 6(b) will be paid in substantially equal installments on the Company's regular payroll schedule and subject to standard deductions and withholdings over the Severance Period following termination; *provided, however,* that no payments will be made prior to the effectiveness of the Release. On the effective date of the Release, the Company will pay you the salary continuation payments that you would have received on or prior to such date in a lump sum under the original schedule but for the delay while waiting for the effectiveness of the release, with the balance of the cash severance being paid as originally scheduled. Bonus payments described in Section 6(b) will be paid in a lump sum cash payment, subject to standard deductions and withholdings on the effective date of the Release.

(d) Definitions. For purposes of this Agreement:

(i) "***Cause***" means the occurrence of any of the following events, conditions or actions: (1) your conviction of any felony or your conviction of any crime involving fraud or dishonesty; (2) your participation (whether by affirmative act or omission) in any material fraud, material act of dishonesty or other material act of misconduct against the Company; (3) your willful and habitual neglect of your duties, provided you have been given written notice of such neglect and, if curable, a reasonable opportunity to cure, not to exceed thirty (30) days; (4) your material violation of any fiduciary duty or duty of loyalty owed to the Company; (5) your breach of any material term of any material contract between you and the Company which has a material adverse effect on the Company; (6) your knowing violation of any material Company policy which has a material adverse effect on the Company; or (7) your knowing violation of state or federal law in connection with the performance of your job which has a material adverse effect on the Company.

(ii) "***Change in Control***" shall have the meaning set forth in the Company's 2013 Equity Incentive Plan.

(iii) "***Good Reason***" means your resignation from employment with the Company (or successor to the Company, if applicable) due to any of the following actions taken by the Company (or successor to the Company, if applicable) without your prior written consent thereto: (1) a material reduction in your base salary, which the parties agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated employees); (2) a material reduction in your authority, duties or responsibilities; (3) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report, including a requirement that you report to a corporate officer or employee instead of reporting directly to the Board;

(4) a relocation of your principal place of employment to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (4) shall not apply. *Notwithstanding the foregoing*, in order to resign for Good Reason, you must (i) provide written notice to the Company within thirty (30) days after the first occurrence of the event giving rise to Good Reason setting forth the basis for your resignation, (ii) allow the Company at least sixty (60) days from receipt of such written notice to cure such event, and (iii) if such event is not reasonably cured within such period, your resignation from all positions you then hold with the Company is effective not later than thirty (30) days after the expiration of the cure period.

7. Tax Provisions.

(a) Section 409A. Notwithstanding anything in this Agreement to the contrary, the following provisions apply to the extent severance benefits provided herein are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the ***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***). Severance benefits shall not commence until you have a Separation from Service. Each installment of severance benefits is a separate "payment" for purposes of Treasury Regulations Section 1.409A-2(b)(2)(i), and the severance benefits are intended to satisfy the exemptions from application of Section 409A provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A-1(b)(9). However, if such exemptions are not available and you are, upon Separation from Service, a "specified employee" for purposes of Section 409A, then, solely to the extent necessary to avoid adverse personal tax consequences under Section 409A, the timing of the severance benefits payments shall be delayed until the earlier of (i) six (6) months and one day after your Separation from Service, or (ii) your death.

You shall receive severance benefits only if you execute and return to the Company the Release within the applicable time period set forth therein and permit such Release to become effective in accordance with its terms, which date may not be later than sixty (60) days following the date of your Separation from Service (such latest permitted date, the ***"Release Deadline"***). If the severance benefits are not covered by one or more exemptions from the application of Section 409A and the Release could become effective in the calendar year following the calendar year in which your Separation from Service occurs, the Release will not be deemed effective any earlier than the Release Deadline. None of the severance benefits will be paid or otherwise delivered prior to the effective date of the Release. Except to the minimum extent that payments must be delayed because you are a "specified employee" or until the effectiveness of the Release, all amounts will be paid as soon as practicable in accordance with the schedule provided herein and in accordance with the Company's normal payroll practices.

The severance benefits are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences under Section 409A, and any ambiguities herein shall be interpreted accordingly.

(b) Section 280G. If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then any such 280G Payment pursuant to this Agreement or otherwise (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account

all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 7(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 7(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 7(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

8. Compliance With Employee Confidentiality and Inventions Assignment and Company Policies

As a condition of employment, you will be required to continue to comply with the Company's Employee Confidentiality and Inventions Assignment that you executed on April 3, 2012, as may be amended by you and the Company from time to time (the "***Confidential Information Agreement***"), which prohibits unauthorized use or disclosure of the Company's proprietary information, among other obligations. In

addition, you will be expected to abide by the Company's rules and policies, as may be changed from time to time within the Company's sole discretion.

9. Protection of Third Party Information

In your work for the Company, you are expected not to use or disclose any confidential information, including trade secrets, of any former employer or other person to whom you have an obligation of confidentiality. Rather, you are expected to use only that information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. You agree that you will not bring onto Company premises, or use in the performance of your duties, any unpublished documents or property belonging to any former employer or other person to whom you have an obligation of confidentiality. You hereby represent that you have disclosed to the Company any contract you have signed that may restrict your activities on behalf of the Company.

10. Outside Activities

Throughout your employment with the Company, you may engage in civic and not-for-profit activities so long as such activities do not interfere with the performance of your duties hereunder or present a conflict of interest with the Company. Subject to the restrictions set forth herein and with the prior written consent of the Board, you may serve as a director of other corporations and may devote a reasonable amount of your time to other types of business or public activities not expressly mentioned in this paragraph. The Board may rescind its consent to your service as a director of all other corporations or participation in other business or public activities, if the Board, in its sole discretion, determines that such activities compromise or threaten to compromise the Company's business interests or conflict with your duties to the Company.

During your employment by the Company, except on behalf of the Company, you will not directly or indirectly serve as an officer, director, stockholder, employee, partner, proprietor, investor, joint venture, associate, representative or consultant of any other person, corporation, firm, partnership or other entity whatsoever that competes with the Company (or is planning or preparing to compete with the Company), anywhere in the world, in any line of business engaged in (or planned to be engaged in) by the Company; provided, however, that you may purchase or otherwise acquire up to (but not more than) one percent (1%) of any class of securities of any enterprise (but without participating in the activities of such enterprise) if such securities are listed on any national or regional securities exchange.

11. Dispute Resolution

To ensure the rapid and economical resolution of disputes that may arise in connection with your employment with the Company, you and the Company agree that any and all disputes, claims, or causes of action, in law or equity, including but not limited to statutory claims, arising from or relating to the enforcement, breach, performance, or interpretation of this Agreement, your employment with the Company, or the termination of your employment from the Company, shall be resolved, to the fullest extent permitted by law, by final, binding and confidential arbitration conducted before a single arbitrator by JAMS, Inc ("***JAMS***") or its successor, under JAMS' then applicable rules and procedures for employment disputes (which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you on request). The arbitration shall take place in the county (or comparable governmental unit) in which you were last employed by the Company, as determined by the arbitrator; provided that if the arbitrator determines there will be an undue hardship to you to have the arbitration in such location, the arbitrator will choose an alternative appropriate location. You and the Company each acknowledge

that by agreeing to this arbitration procedure, you waive the right to resolve any such dispute through a trial by jury or judge or administrative proceeding. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator, and not a court, shall also be authorized to determine whether the provisions of this section apply to a dispute, controversy, or claim sought to be resolved in accordance with these arbitration procedures. The Company shall pay all arbitration fees and costs in excess of the administrative fees that you would be required to incur if the dispute were filed or decided in a court of law. Nothing in this Agreement is intended to prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration.

12. Miscellaneous

This Agreement, together with your Confidential Information Agreement, forms the complete and exclusive statement of your employment agreement with the Company. It supersedes the Prior Agreement and any other agreements or promises made to you by anyone, whether oral or written, except for any outstanding stock option or other equity award agreement previously entered into between you and the Company. Changes in your employment terms, other than those changes expressly reserved to the Company's or Board's discretion in this Agreement, require a written modification approved by the Board and signed by a duly authorized member of the Board or the President and Chief Executive Officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This Agreement shall be construed and enforced in accordance with the laws of the State of California without regard to conflicts of law principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in counterparts which shall be deemed to be part of one original, and facsimile signatures shall be equivalent to original signatures.

Please sign and date this Agreement and return it to me as soon as practicable if you wish to accept continued employment at the Company under the terms described above. I would be happy to discuss any questions that you may have about these terms.

The Board looks forward to your favorable reply and to a continued productive and enjoyable work relationship.

Sincerely,
/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President and Chief Executive Officer

Understood and Accepted:

/s/ Fredrik Wiklund	9/3/13
Fredrik Wiklund	Date

EXHIBIT A

RELEASE AGREEMENT
(To be signed on or after the Separation Date)

1. Consideration. I understand that my position with Celladon Corporation (the "***Company***") terminated effective _____, 201__ (the "***Separation Date***"). The Company has agreed that if I timely sign, date and return this Release Agreement ("***Release***"), and I do not revoke it, the Company will provide me with certain severance benefits pursuant to the terms and conditions of that certain Letter Agreement between myself and the Company dated _____, 2013 (the "***Employment Agreement***"), and any agreements incorporated therein by reference. I understand that I am not entitled to such severance benefits unless I timely sign this Release and allow it to become effective.

2. General Release. In exchange for the consideration to be provided to me under the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release, acquit and forever discharge the Company and its parent, subsidiary, and affiliated entities, and investors, along with its and their predecessors and successors and their respective directors, officers, employees, shareholders, stockholders, partners, agents, attorneys, insurers, affiliates and assigns (collectively, the "***Released Parties***"), of and from any and all claims, liabilities and obligations, both known and unknown, that arise from or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date that I sign this Release (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: **(a)** all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; **(b)** all claims related to my compensation or benefits from the Company, including salary, bonuses, commissions, other incentive compensation, vacation pay and the redemption thereof, expense reimbursements, fringe benefits, stock, stock options, or any other ownership or equity interests in the Company; **(c)** all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; **(d)** all tort claims, including but not limited to claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and **(e)** all federal, state, and local statutory claims, including but not limited to claims for discrimination, harassment, retaliation, attorneys' fees, penalties, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990 (as amended), the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), the federal Family and Medical Leave Act ("***FMLA***"), the California Labor Code (as amended), and the California Fair Employment and Housing Act (as amended).

3. Excluded Claims. Notwithstanding the foregoing, the following are not included in the Released Claims (the "***Excluded Claims***"): **(a)** any rights or claims for indemnification I may have pursuant to any written indemnification agreement with the Company to which I am a party, the Company's bylaws, or applicable law; and **(b)** any rights which are not waivable as a matter of law. In addition, nothing in this Release prevents me from filing, cooperating with, or participating in any investigation or proceeding before the Equal Employment Opportunity Commission, the Department of Labor, the California Department of Fair Employment and Housing, or any other government agency, except that I hereby waive my right to any monetary benefits in connection with any such claim, charge, investigation or proceeding. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

4. ADEA Waiver. I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA ("***ADEA Waiver***"). I also acknowledge that the consideration given for the ADEA Waiver is in addition to anything of value to which I was already entitled. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: **(a)** my ADEA Waiver does not apply to any rights or claims that arise after the date I sign this Release; **(b)** I should consult with an attorney prior to signing this Release; **(c)** I have twenty-one (21) days to consider this Release (although I may choose to voluntarily sign it sooner); **(d)** I have seven (7) days following the date I sign this Release to revoke the ADEA Waiver; and **(e)** the ADEA Waiver will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth day after I sign this Release.

5. Section 1542 Waiver. In giving the general release herein, which includes claims which may be unknown to me at present, I acknowledge that I have read and understand Section 1542 of the California Civil Code, which reads as follows: **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."** I hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to my release of claims, including but not limited to any unknown or unsuspected claims herein.

6. Other Agreements and Representations. I further agree: **(a)** not to voluntarily (except in response to legal compulsion) assist any third party in bringing or pursuing any proposed or pending litigation, arbitration, administrative claim or other formal proceeding against the Company, its parent or subsidiary entities, investors, affiliates, officers, directors, employees or agents; **(b)** to cooperate fully with the Company, by voluntarily (without legal compulsion) providing accurate and complete information, in connection with the Company's actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or other matters, arising from events, acts, or failures to act that occurred during the period of my employment by the Company; and **(c)** I hereby acknowledge and reaffirm my continuing obligations under the terms of my Confidential Information Agreement (as defined in the Employment Agreement). In addition, I hereby represent that I have received all the leave and leave benefits and protections for which I am eligible, pursuant to FMLA, the California Family Rights Act, or any applicable law or Company policy, and I have not suffered any on-the-job injury for which I have not already filed a workers' compensation claim.

This Release, together with the Confidential Information Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release may only be modified by a writing signed by both me and a duly authorized officer of the Company.

UNDERSTOOD AND AGREED:

_____

FREDRIK WIKLUND

Date: _____

Exhibit 10.11

August 30, 2013

Krisztina M. Zsebo, Ph.D.

Re: Employment Terms

Dear Krisztina:

On behalf of the Board of Directors (the "***Board***") of Celladon Corporation (the "***Company***"), I am pleased to offer you continued employment at the Company on the terms set forth in this letter agreement (the "***Agreement***"). Subject to your acceptance by signing below, this Agreement will become effective upon the date of the underwriting agreement between the Company and the underwriter(s) managing the initial public offering of the Company's common stock, pursuant to which such common stock is priced for the initial public offering (the "***Effective Date***"). As of the Effective Date, this Agreement replaces and supersedes in its entirety the letter agreement between you and the Company dated July 2, 2012 (the "***Prior Agreement***"), as provided in Section 12 below.

1. Employment and Board Positions and Duties

You will continue to be employed as the Company's President and Chief Executive Officer, and you shall perform the duties of such positions as are customary, as specified in the Bylaws of the Company, and as may be required by the Board. You will report to the Board. During your service as President and Chief Executive Officer, you will continue to serve as a member of the Board, unless otherwise provided by the Board.

During your employment with the Company, you will devote your full-time best efforts and business time and attention to the business of the Company. Your employment relationship with the Company shall also be governed by the general employment policies and practices of the Company (except that if the terms of this Agreement differ from or are in conflict with the Company's general employment policies or practices, this Agreement will control), and you will be required to abide by the general employment policies and practices of the Company. The Board reserves the right to change your position, duties, reporting relationship, work location, and the Company's general employment policies and procedures, from time to time in its discretion.

2. Base Salary and Employee Benefits

Your base salary will be paid at the rate of $34,793.67 per month (an annual rate of $417,524.00), less payroll deductions and withholdings. You will be paid your base salary on a semi-monthly basis, on the Company's normal payroll schedule. As an exempt salaried employee, you will be required to work the Company's normal business hours, and such additional time as appropriate for your work assignments and positions. You will not be eligible for overtime premiums.

As a regular, full-time employee, you will be eligible to participate in the Company's standard employee benefits, pursuant to the terms and conditions of the benefit plans and the applicable Company policies. Subject to change, the Company currently provides group medical, dental and vision care insurance, a life, AD&D, long-term and short-term disability insurance program, a life insurance cash subsidy, a

health reimbursement arrangement and a 401(k) plan. The Company may change its compensation and benefits from time to time in its discretion. In addition to the Company's annual holiday schedule, you will accrue at a rate of 15 days per year of paid time off, including both vacation and sick leave, subject to a maximum accrual of 240 hours. This allowance is subject to the Company's policies with respect to accrual of, including limitations on the maximum permitted accrual of, paid time off and is subject to change in accordance with changes in Company policy.

3. Annual Performance Bonus

As President and Chief Executive Officer, you will be eligible to earn an annual performance bonus (including for the full year in which this Agreement becomes effective) pursuant to the Company's annual incentive bonus plan, with the target amount of such bonus equal to forty-five percent (45%) of your annual base salary. The bonus, if any, will be based upon the Board's assessment of your performance and the Company's attainment of targeted goals as set by the Board in its sole discretion. Bonus payments, if any, will be subject to applicable payroll deductions and withholdings. Following the close of each calendar year, the Board will determine whether you have earned a performance bonus, and the amount of any performance bonus, based on the set criteria. No amount of the annual bonus is guaranteed, and you must be an employee in good standing through the end of the applicable bonus determination period to earn and be eligible to receive a bonus; no partial or prorated bonuses will be provided (except as provided in Section 6 below). In all events, any earned bonus will be paid not later than March 15 of the year following the year in which your right to such amount became vested. Your base salary and bonus eligibility will be reviewed on an annual or more frequent basis by the Board, and are subject to change in the discretion of the Board. For the avoidance of doubt, all references in this agreement to the Board shall include any authorized committee of the Board.

4. Stock Options and Employee Stock Purchase Plan

You will be eligible to participate in and receive stock option or equity award grants under the Company's equity incentive plans from time to time in the discretion of the Board, and in accordance with the terms and conditions of such plans. Any stock options or other equity awards that you have been granted by the Company prior to the Effective Date will continue to be governed in all respects by the terms of the applicable grant notices, award agreements and plan documents.

In addition, we expect to adopt an employee stock purchase plan that will become effective upon the Effective Date. You will be eligible to participate in our employee stock purchase plan and purchase our common stock at a discount.

5. At-Will Employment Relationship

Your employment relationship is at will. You may terminate your employment with the Company at any time and for any reason whatsoever simply by notifying the Company. Likewise, the Company may terminate your employment at any time, with or without Cause (as defined below), and with or without advance notice. Your employment at-will status can only be modified in a written agreement approved by the Board and signed by you and a duly authorized member of the Board.

6. Severance Benefits.

In the event your employment with the Company is terminated for any reason, you will be entitled to all of your earned compensation and benefits or otherwise as required by law through the date of termination

(the "***Accrued Amounts***"). For the avoidance of doubt, you shall not be entitled to any additional compensation or benefits in the event your employment is terminated for Cause, due to your resignation without Good Reason, upon your death or upon your disability. If your employment terminates due to an Involuntary Termination (as defined below), you will be eligible to receive the additional compensation and benefits described in Section 6(a) and 6(b).

(a) Involuntary Termination other than in Connection with a Change in Control. If at any time (i) the Company terminates your employment without Cause (as defined below and other than as a result of your death or disability), or (ii) you resign for Good Reason (as defined below), and provided in any case such termination constitutes a "separation from service", as defined under Treasury Regulation Section 1.409A-1(h)) (a "***Separation from Service***") (such termination described in (i) or (ii), an "***Involuntary Termination***"), you shall be entitled to receive the following severance benefits, subject in all events to your compliance with Section 6(c) below:

(i) You shall receive severance pay in the form of continuation of your base salary in effect (ignoring any decrease that forms the basis for your resignation for Good Reason, if applicable) on the effective date of your Involuntary Termination for the first twelve (12) months (the "***Severance Period***") after the date of such termination; and

(ii) If you are eligible for and timely elect to continue your health insurance coverage under the Company's group health plans under the Consolidated Omnibus Budget Reconciliation Act of 1985 or the state equivalent ("***COBRA***") following your termination date, the Company will pay the COBRA group health insurance premiums for you and your eligible dependents until the earliest of (A) the close of the Severance Period, (B) the expiration of your eligibility for the continuation coverage under COBRA, or (C) the date when you become eligible for substantially equivalent health insurance coverage in connection with new employment or self-employment. For purposes of this Section, references to COBRA premiums shall not include any amounts payable by you under a Section 125 health care reimbursement plan under the U.S. Internal Revenue Code. Notwithstanding the foregoing, if at any time the Company determines, in its sole discretion, that it cannot pay the COBRA premiums without potentially incurring financial costs or penalties under applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then regardless of whether you elect continued health coverage under COBRA, and in lieu of providing the COBRA premiums, the Company will instead pay you on the last day of each remaining month of the Severance Period, a fully taxable cash payment equal to the COBRA premiums for that month, subject to applicable tax withholdings (such amount, the "***Health Care Benefit Payment***"). The Health Care Benefit Payment shall be paid in monthly installments on the same schedule that the COBRA premiums would otherwise have been paid and shall be equal to the amount that the Company would have otherwise paid for COBRA premiums, and shall be paid until the earlier of (i) expiration of the Severance Period or (ii) the date you voluntarily enroll in a health insurance plan offered by another employer or entity.

(b) Involuntary Termination in Connection with a Change in Control. In the event that your Involuntary Termination occurs within the three (3) months prior to, or twelve (12) months following the consummation of a Change in Control and subject in all events to your compliance with Section 6(c) below, then you shall be entitled to the benefits provided above in Section 6(a), except that:

(i) The Severance Period for purposes of continued salary and COBRA benefits shall be eighteen (18) months, rather than twelve (12) months; you shall receive a lump sum payment of your target bonus for the year of termination; and in addition,

(ii) The vesting of all of your outstanding stock options and other equity awards that are subject to time-based vesting requirements shall accelerate in full such that all such equity awards shall be deemed fully vested as of the date of your Involuntary Termination.

(c) Conditions and Timing for Severance Benefits. The severance benefits set forth in Sections 6(a) and 6(b) above are expressly conditioned upon: (i) your continuing to comply with your obligations under your Confidential Information Agreement (as defined in Section 8 below); (ii) if you are a member of the Board as of your termination, your resignation from the Board, to be effective no later than the date of your termination (or such other date as requested by the Board) and (iii) you signing and not revoking a general release of legal claims in the form attached hereto as **EXHIBIT A** or a substantially similar form provided that, for the avoidance of doubt, such form will include a commitment from you to comply with your continuing obligations under your Confidential Information Agreement, but will not include a noncompetition provision and will not include a release of any rights or claims for indemnification you may have pursuant to any written indemnification agreement with the Company to which you are a party, the Company's bylaws, or applicable law (the "***Release***") within the applicable deadline set forth therein and permitting the Release to become effective in accordance with its terms, which must occur no later than the Release Deadline (as defined in Section 7 below). The salary continuation payments described in Sections 6(a) and 6(b) will be paid in substantially equal installments on the Company's regular payroll schedule and subject to standard deductions and withholdings over the Severance Period following termination; *provided*, *however,* that no payments will be made prior to the effectiveness of the Release. On the effective date of the Release, the Company will pay you the salary continuation payments that you would have received on or prior to such date in a lump sum under the original schedule but for the delay while waiting for the effectiveness of the release, with the balance of the cash severance being paid as originally scheduled. Bonus payments described in Section 6(b) will be paid in a lump sum cash payment, subject to standard deductions and withholdings on the effective date of the Release.

(d) Definitions. For purposes of this Agreement:

(i) "***Cause***" means the occurrence of any of the following events, conditions or actions: (1) your conviction of any felony or your conviction of any crime involving fraud or dishonesty; (2) your participation (whether by affirmative act or omission) in any material fraud, material act of dishonesty or other material act of misconduct against the Company; (3) your willful and habitual neglect of your duties, provided you have been given written notice of such neglect and, if curable, a reasonable opportunity to cure, not to exceed thirty (30) days; (4) your material violation of any fiduciary duty or duty of loyalty owed to the Company; (5) your breach of any material term of any material contract between you and the Company which has a material adverse effect on the Company; (6) your knowing violation of any material Company policy which has a material adverse effect on the Company; or (7) your knowing violation of state or federal law in connection with the performance of your job which has a material adverse effect on the Company.

(ii) "***Change in Control***" shall have the meaning set forth in the Company's 2013 Equity Incentive Plan.

(iii) "***Good Reason***" means your resignation from employment with the Company (or successor to the Company, if applicable) due to any of the following actions taken by the Company (or successor to the Company, if applicable) without your prior written consent thereto: (1) a material reduction in your base salary, which the parties agree is a reduction of at least 10% of your base salary (unless pursuant to a salary reduction program applicable generally to the Company's similarly situated

employees); (2) a material reduction in your authority, duties or responsibilities; (3) a material reduction in the authority, duties, or responsibilities of the supervisor to whom you are required to report, including a requirement that you report to a corporate officer or employee instead of reporting directly to the Board; (4) a relocation of your principal place of employment to a place that increases your one-way commute by more than fifty (50) miles as compared to your then-current principal place of employment immediately prior to such relocation (excluding regular travel in the ordinary course of business); provided that if your principal place of employment is your personal residence, this clause (4) shall not apply. *Notwithstanding the foregoing*, in order to resign for Good Reason, you must (i) provide written notice to the Company within thirty (30) days after the first occurrence of the event giving rise to Good Reason setting forth the basis for your resignation, (ii) allow the Company at least sixty (60) days from receipt of such written notice to cure such event, and (iii) if such event is not reasonably cured within such period, your resignation from all positions you then hold with the Company is effective not later than thirty (30) days after the expiration of the cure period.

7. Tax Provisions.

(a) Section 409A. Notwithstanding anything in this Agreement to the contrary, the following provisions apply to the extent severance benefits provided herein are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the ***"Code"***) and the regulations and other guidance thereunder and any state law of similar effect (collectively ***"Section 409A"***). Severance benefits shall not commence until you have a Separation from Service. Each installment of severance benefits is a separate "payment" for purposes of Treasury Regulations Section 1.409A-2(b)(2)(i), and the severance benefits are intended to satisfy the exemptions from application of Section 409A provided under Treasury Regulations Sections 1.409A-1(b)(4), 1.409A-1(b)(5) and 1.409A-1(b)(9). However, if such exemptions are not available and you are, upon Separation from Service, a "specified employee" for purposes of Section 409A, then, solely to the extent necessary to avoid adverse personal tax consequences under Section 409A, the timing of the severance benefits payments shall be delayed until the earlier of (i) six (6) months and one day after your Separation from Service, or (ii) your death.

You shall receive severance benefits only if you execute and return to the Company the Release within the applicable time period set forth therein and permit such Release to become effective in accordance with its terms, which date may not be later than sixty (60) days following the date of your Separation from Service (such latest permitted date, the ***"Release Deadline"***). If the severance benefits are not covered by one or more exemptions from the application of Section 409A and the Release could become effective in the calendar year following the calendar year in which your Separation from Service occurs, the Release will not be deemed effective any earlier than the Release Deadline. None of the severance benefits will be paid or otherwise delivered prior to the effective date of the Release. Except to the minimum extent that payments must be delayed because you are a "specified employee" or until the effectiveness of the Release, all amounts will be paid as soon as practicable in accordance with the schedule provided herein and in accordance with the Company's normal payroll practices.

The severance benefits are intended to qualify for an exemption from application of Section 409A or comply with its requirements to the extent necessary to avoid adverse personal tax consequences under Section 409A, and any ambiguities herein shall be interpreted accordingly.

(b) Section 280G. If any payment or benefit you will or may receive from the Company or otherwise (a "***280G Payment***") would (i) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (ii) but for this sentence, be subject to the excise tax imposed by Section 4999 of

the Code (the "***Excise Tax***"), then any such 280G Payment pursuant to this Agreement or otherwise (a "***Payment***") shall be equal to the Reduced Amount. The "***Reduced Amount***" shall be either (x) the largest portion of the Payment that would result in no portion of the Payment (after reduction) being subject to the Excise Tax or (y) the largest portion, up to and including the total, of the Payment, whichever amount (i.e., the amount determined by clause (x) or by clause (y)), after taking into account all applicable federal, state and local employment taxes, income taxes, and the Excise Tax (all computed at the highest applicable marginal rate), results in your receipt, on an after-tax basis, of the greater economic benefit notwithstanding that all or some portion of the Payment may be subject to the Excise Tax. If a reduction in a Payment is required pursuant to the preceding sentence and the Reduced Amount is determined pursuant to clause (x) of the preceding sentence, the reduction shall occur in the manner (the "***Reduction Method***") that results in the greatest economic benefit for you. If more than one method of reduction will result in the same economic benefit, the items so reduced will be reduced pro rata (the "***Pro Rata Reduction Method***").

Notwithstanding the foregoing, if the Reduction Method or the Pro Rata Reduction Method would result in any portion of the Payment being subject to taxes pursuant to Section 409A that would not otherwise be subject to taxes pursuant to Section 409A, then the Reduction Method and/or the Pro Rata Reduction Method, as the case may be, shall be modified so as to avoid the imposition of taxes pursuant to Section 409A as follows: (A) as a first priority, the modification shall preserve to the greatest extent possible, the greatest economic benefit for you as determined on an after-tax basis; (B) as a second priority, Payments that are contingent on future events (e.g., being terminated without cause), shall be reduced (or eliminated) before Payments that are not contingent on future events; and (C) as a third priority, Payments that are "deferred compensation" within the meaning of Section 409A shall be reduced (or eliminated) before Payments that are not deferred compensation within the meaning of Section 409A.

Unless you and the Company agree on an alternative accounting firm, the accounting firm engaged by the Company for general tax compliance purposes as of the day prior to the effective date of the change of control transaction triggering the Payment shall perform the foregoing calculations. If the accounting firm so engaged by the Company is serving as accountant or auditor for the individual, entity or group effecting the change of control transaction, the Company shall appoint a nationally recognized accounting firm to make the determinations required hereunder. The Company shall bear all expenses with respect to the determinations by such accounting firm required to be made hereunder. The Company shall use commercially reasonable efforts to cause the accounting firm engaged to make the determinations hereunder to provide its calculations, together with detailed supporting documentation, to you and the Company within fifteen (15) calendar days after the date on which your right to a 280G Payment becomes reasonably likely to occur (if requested at that time by you or the Company) or such other time as requested by you or the Company.

If you receive a Payment for which the Reduced Amount was determined pursuant to clause (x) of the first paragraph of this Section 7(b) and the Internal Revenue Service determines thereafter that some portion of the Payment is subject to the Excise Tax, you shall promptly return to the Company a sufficient amount of the Payment (after reduction pursuant to clause (x) of the first paragraph of this Section 7(b) so that no portion of the remaining Payment is subject to the Excise Tax. For the avoidance of doubt, if the Reduced Amount was determined pursuant to clause (y) in the first paragraph of this Section 7(b), you shall have no obligation to return any portion of the Payment pursuant to the preceding sentence.

8. Compliance With Employee Confidentiality and Inventions Assignment and Company Policies

As a condition of employment, you will be required to continue to comply with the Company's Employee Confidentiality and Inventions Assignment that you executed on October 17, 2007, as may be amended by you and the Company from time to time (the "***Confidential Information Agreement***"), which prohibits unauthorized use or disclosure of the Company's proprietary information, among other obligations. In addition, you will be expected to abide by the Company's rules and policies, as may be changed from time to time within the Company's sole discretion.

9. Protection of Third Party Information

In your work for the Company, you are expected not to use or disclose any confidential information, including trade secrets, of any former employer or other person to whom you have an obligation of confidentiality. Rather, you are expected to use only that information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. You agree that you will not bring onto Company premises, or use in the performance of your duties, any unpublished documents or property belonging to any former employer or other person to whom you have an obligation of confidentiality. You hereby represent that you have disclosed to the Company any contract you have signed that may restrict your activities on behalf of the Company.

10. Outside Activities

Throughout your employment with the Company, you may engage in civic and not-for-profit activities so long as such activities do not interfere with the performance of your duties hereunder or present a conflict of interest with the Company. Subject to the restrictions set forth herein and with the prior written consent of the Board, you may serve as a director of other corporations and may devote a reasonable amount of your time to other types of business or public activities not expressly mentioned in this paragraph. The Board may rescind its consent to your service as a director of all other corporations or participation in other business or public activities, if the Board, in its sole discretion, determines that such activities compromise or threaten to compromise the Company's business interests or conflict with your duties to the Company.

During your employment by the Company, except on behalf of the Company, you will not directly or indirectly serve as an officer, director, stockholder, employee, partner, proprietor, investor, joint venture, associate, representative or consultant of any other person, corporation, firm, partnership or other entity whatsoever that competes with the Company (or is planning or preparing to compete with the Company), anywhere in the world, in any line of business engaged in (or planned to be engaged in) by the Company; provided, however, that you may purchase or otherwise acquire up to (but not more than) one percent (1%) of any class of securities of any enterprise (but without participating in the activities of such enterprise) if such securities are listed on any national or regional securities exchange.

11. Dispute Resolution

To ensure the rapid and economical resolution of disputes that may arise in connection with your employment with the Company, you and the Company agree that any and all disputes, claims, or causes of action, in law or equity, including but not limited to statutory claims, arising from or relating to the enforcement, breach, performance, or interpretation of this Agreement, your employment with the

Company, or the termination of your employment from the Company, shall be resolved, to the fullest extent permitted by law, by final, binding and confidential arbitration conducted before a single arbitrator by JAMS, Inc ("***JAMS***") or its successor, under JAMS' then applicable rules and procedures for employment disputes (which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you on request). The arbitration shall take place in the county (or comparable governmental unit) in which you were last employed by the Company, as determined by the arbitrator; provided that if the arbitrator determines there will be an undue hardship to you to have the arbitration in such location, the arbitrator will choose an alternative appropriate location. You and the Company each acknowledge that by agreeing to this arbitration procedure, you waive the right to resolve any such dispute through a trial by jury or judge or administrative proceeding. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator, and not a court, shall also be authorized to determine whether the provisions of this section apply to a dispute, controversy, or claim sought to be resolved in accordance with these arbitration procedures. The Company shall pay all arbitration fees and costs in excess of the administrative fees that you would be required to incur if the dispute were filed or decided in a court of law. Nothing in this Agreement is intended to prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration.

12. Miscellaneous

This Agreement, together with your Confidential Information Agreement, forms the complete and exclusive statement of your employment agreement with the Company. It supersedes the Prior Agreement and any other agreements or promises made to you by anyone, whether oral or written, except for any outstanding stock option or other equity award agreement previously entered into between you and the Company. Changes in your employment terms, other than those changes expressly reserved to the Company's or Board's discretion in this Agreement, require a written modification approved by the Board and signed by a duly authorized member of the Board. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this Agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This Agreement shall be construed and enforced in accordance with the laws of the State of California without regard to conflicts of law principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement, or rights hereunder, shall be in writing and shall not be deemed to be a waiver of any successive breach or rights hereunder. This Agreement may be executed in counterparts which shall be deemed to be part of one original, and facsimile signatures shall be equivalent to original signatures.

Please sign and date this Agreement and return it to me as soon as practicable if you wish to accept continued employment at the Company under the terms described above. I would be happy to discuss any questions that you may have about these terms.

The Board looks forward to your favorable reply and to a continued productive and enjoyable work relationship.

Sincerely,

/s/ Barbara J. Dalton
Barbara J. Dalton, Ph.D.
Chairman of the Board of Directors

Understood and Accepted:

/s/ Krisztina M. Zsebo
Krisztina M. Zsebo, Ph.D.

8/30/13
Date

EXHIBIT A

RELEASE AGREEMENT
(To be signed on or after the Separation Date)

1. Consideration. I understand that my position with Celladon Corporation (the "***Company***") terminated effective _____, 201__ (the "***Separation Date***"). The Company has agreed that if I timely sign, date and return this Release Agreement ("***Release***"), and I do not revoke it, the Company will provide me with certain severance benefits pursuant to the terms and conditions of that certain Letter Agreement between myself and the Company dated _____, 2013 (the "***Employment Agreement***"), and any agreements incorporated therein by reference. I understand that I am not entitled to such severance benefits unless I timely sign this Release and allow it to become effective.

2. General Release. In exchange for the consideration to be provided to me under the Employment Agreement that I am not otherwise entitled to receive, I hereby generally and completely release, acquit and forever discharge the Company and its parent, subsidiary, and affiliated entities, and investors, along with its and their predecessors and successors and their respective directors, officers, employees, shareholders, stockholders, partners, agents, attorneys, insurers, affiliates and assigns (collectively, the "***Released Parties***"), of and from any and all claims, liabilities and obligations, both known and unknown, that arise from or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date that I sign this Release (collectively, the "***Released Claims***"). The Released Claims include, but are not limited to: **(a)** all claims arising out of or in any way related to my employment with the Company, or the termination of that employment; **(b)** all claims related to my compensation or benefits from the Company, including salary, bonuses, commissions, other incentive compensation, vacation pay and the redemption thereof, expense reimbursements, fringe benefits, stock, stock options, or any other ownership or equity interests in the Company; **(c)** all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; **(d)** all tort claims, including but not limited to claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and **(e)** all federal, state, and local statutory claims, including but not limited to claims for discrimination, harassment, retaliation, attorneys' fees, penalties, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990 (as amended), the federal Age Discrimination in Employment Act of 1967 (as amended) (the "***ADEA***"), the federal Family and Medical Leave Act ("***FMLA***"), the California Labor Code (as amended), and the California Fair Employment and Housing Act (as amended).

3. Excluded Claims. Notwithstanding the foregoing, the following are not included in the Released Claims (the "***Excluded Claims***"): **(a)** any rights or claims for indemnification I may have pursuant to any written indemnification agreement with the Company to which I am a party, the Company's bylaws, or applicable law; and **(b)** any rights which are not waivable as a matter of law. In addition, nothing in this Release prevents me from filing, cooperating with, or participating in any investigation or proceeding before the Equal Employment Opportunity Commission, the Department of Labor, the California Department of Fair Employment and Housing, or any other government agency, except that I hereby waive my right to any monetary benefits in connection with any such claim, charge, investigation or proceeding. I hereby represent and warrant that, other than the Excluded Claims, I am not aware of any claims I have or might have against any of the Released Parties that are not included in the Released Claims.

4. ADEA Waiver. I acknowledge that I am knowingly and voluntarily waiving and releasing any rights I may have under the ADEA ("***ADEA Waiver***"). I also acknowledge that the consideration given for the ADEA Waiver is in addition to anything of value to which I was already entitled. I further acknowledge that I have been advised by this writing, as required by the ADEA, that: **(a)** my ADEA Waiver does not apply to any rights or claims that arise after the date I sign this Release; **(b)** I should consult with an attorney prior to signing this Release; **(c)** I have twenty-one (21) days to consider this Release (although I may choose to voluntarily sign it sooner); **(d)** I have seven (7) days following the date I sign this Release to revoke the ADEA Waiver; and **(e)** the ADEA Waiver will not be effective until the date upon which the revocation period has expired unexercised, which will be the eighth day after I sign this Release.

5. Section 1542 Waiver. In giving the general release herein, which includes claims which may be unknown to me at present, I acknowledge that I have read and understand Section 1542 of the California Civil Code, which reads as follows: **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."** I hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to my release of claims, including but not limited to any unknown or unsuspected claims herein.

6. Other Agreements and Representations. I further agree: **(a)** not to voluntarily (except in response to legal compulsion) assist any third party in bringing or pursuing any proposed or pending litigation, arbitration, administrative claim or other formal proceeding against the Company, its parent or subsidiary entities, investors, affiliates, officers, directors, employees or agents; **(b)** to cooperate fully with the Company, by voluntarily (without legal compulsion) providing accurate and complete information, in connection with the Company's actual or contemplated defense, prosecution, or investigation of any claims or demands by or against third parties, or other matters, arising from events, acts, or failures to act that occurred during the period of my employment by the Company; and **(c)** I hereby acknowledge and reaffirm my continuing obligations under the terms of my Confidential Information Agreement (as defined in the Employment Agreement). In addition, I hereby represent that I have received all the leave and leave benefits and protections for which I am eligible, pursuant to FMLA, the California Family Rights Act, or any applicable law or Company policy, and I have not suffered any on-the-job injury for which I have not already filed a workers' compensation claim.

This Release, together with the Confidential Information Agreement, constitutes the complete, final and exclusive embodiment of the entire agreement between the Company and me with regard to the subject matter hereof. I am not relying on any promise or representation by the Company that is not expressly stated herein. This Release may only be modified by a writing signed by both me and a duly authorized officer of the Company.

UNDERSTOOD AND AGREED:

_____

KRISZTINA M. ZSEBO, PH.D.

Date: _____

Exhibit 10.12

August 30, 2013

Gregg Huber Alton
234 Pohlemus Ave.
Atherton, CA 94027

Re: Position on the Board of Directors of Celladon Corporation

Dear Gregg:

It is my sincere pleasure, on behalf of Celladon Corporation ("Celladon"), to offer you a position on the Board of Directors (the "Board") of Celladon, effective upon your formal acceptance of this offer by signing below. It is anticipated that you will serve as Chairman of the Nominating & Governance Committee and a member of the Compensation Committee of the Board.

As compensation for your service on the Board, you will be granted a stock option under Celladon's equity incentive plan to purchase shares representing 0.10% of Celladon's fully diluted common stock outstanding as of the date of grant. Subject to your continued service on the Board, the stock option will be granted on the date of the Board's receipt and approval of a 409A valuation of Celladon's common stock as of September 30, 2013. The option would vest in equal annual installments over a three-year term commencing on the date of your acceptance of this offer, subject to your continued service to the Company.

In addition, on and after the date of the underwriting agreement between Celladon and the underwriters managing the initial public offering of Celladon's common stock (the "IPO"), you would be entitled to receive the annual equity grants and cash fees provided to Celladon's non-employee directors pursuant to Celladon's non-employee director compensation policy as in effect from time to time. Please note that should the IPO occur, the stock option described above will serve as your initial grant under Celladon's non-employee director compensation policy, except that if the stock option described above, after adjustment for any reverse stock split following the grant date, covers less shares than the initial grant under Celladon's non-employee director compensation policy (20,000 shares), you will receive an initial grant under Celladon's non-employee director compensation policy at the time of the IPO in an amount necessary so that immediately after such second grant, you hold options to purchase an aggregate of 20,000 shares of Celladon's common stock. Celladon will also reimburse you for reasonable out-of-pocket travel expenses incurred in connection with your attendance at Board meetings.

If the terms of this letter are acceptable to you and you agree to serve on Celladon's Board, please sign and date this letter below and return it to us via PDF or facsimile, retaining a copy for your records.

Very truly yours,

/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President, Chief Executive Officer and Director
Celladon Corporation

Accepted and agreed:

/s/ Gregg Huber Alton
Gregg Huber Alton

Date: 8/30/13

Exhibit 10.13

August 30, 2013

Graham Cooper
17 Selborne Drive
Piedmont, CA 94611

Re: Position on the Board of Directors of Celladon Corporation

Dear Graham:

It is my sincere pleasure, on behalf of Celladon Corporation ("Celladon"), to offer you a position on the Board of Directors (the "Board") of Celladon, effective upon your formal acceptance of this offer by signing below. It is anticipated that you will serve as Chairman of the Audit Committee and a member of the Nominating & Governance Committee of the Board.

As compensation for your service on the Board, you will be granted a stock option under Celladon's equity incentive plan to purchase shares representing 0.10% of Celladon's fully diluted common stock outstanding as of the date of grant. Subject to your continued service on the Board, the stock option will be granted on the date of the Board's receipt and approval of a 409A valuation of Celladon's common stock as of September 30, 2013. The option would vest in equal annual installments over a three-year term commencing on the date of your acceptance of this offer, subject to your continued service to the Company.

In addition, on and after the date of the underwriting agreement between Celladon and the underwriters managing the initial public offering of Celladon's common stock (the "IPO"), you would be entitled to receive the annual equity grants and cash fees provided to Celladon's non-employee directors pursuant to Celladon's non-employee director compensation policy as in effect from time to time. Please note that should the IPO occur, the stock option described above will serve as your initial grant under Celladon's non-employee director compensation policy, except that if the stock option described above, after adjustment for any reverse stock split following the grant date, covers less shares than the initial grant under Celladon's non-employee director compensation policy (20,000 shares), you will receive an initial grant under Celladon's non-employee director compensation policy at the time of the IPO in an amount necessary so that immediately after such second grant, you hold options to purchase an aggregate of 20,000 shares of Celladon's common stock. Celladon will also reimburse you for reasonable out-of-pocket travel expenses incurred in connection with your attendance at Board meetings.

If the terms of this letter are acceptable to you and you agree to serve on Celladon's Board, please sign and date this letter below and return it to us via PDF or facsimile, retaining a copy for your records.

Very truly yours,

/s/ Krisztina Zsebo
Krisztina Zsebo, Ph.D.
President, Chief Executive Officer and Director
Celladon Corporation

Accepted and agreed:

/s/ Graham Cooper
Graham Cooper

Date: 9/2/13

Exhibit 10.15

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

LICENSE AGREEMENT

BETWEEN

CELLADON CORPORATION

AND

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

FOR

CASE NO. [...***...]
CASE NO. [...***...]
CASE NO. [...***...]
CASE NO. [...***...]
CASE NO. [...***...]
CASE NO. [...***...]
CASE NO. [...***...]

*****Confidential Treatment Requested**

LICENSE AGREEMENT

This agreement ("Agreement") is made by and between Celladon Corporation, a California corporation having a business address at 9445 La Jolla Farms Road, La Jolla, California 92037 ("LICENSEE") and The Regents Of The University Of California, a California corporation, having its statewide administrative offices at 1111 Franklin Street, 12th Floor, Oakland, California 94607-5200 ("UNIVERSITY"), represented by its San Diego campus having an address at University of California, San Diego, Technology Transfer and Intellectual Property Services, Mailcode 0910, 9500 Gilman Drive, La Jolla, California 92093-0910 ("UCSD").

This Effective Date of this Agreement is the date of the last signature.

RECITALS

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...]" ("First Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "First Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Second Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Second Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Third Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Third Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Fourth Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Fourth Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Fifth Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Fifth Inventors") and are covered by Patent Rights as defined below;

*****Confidential Treatment Requested**

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Sixth Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Sixth Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the inventions disclosed in UCSD Case Docket No. [...***...] and titled "[...***...]" ("Seventh Invention"), were made in the course of research at UCSD by [...***...] (collectively, the "Seventh Inventors") and are covered by Patent Rights as defined below;

WHEREAS, the research from which the Second, Third, Fourth, and Seventh Invention arose was sponsored by the United States ("US") Government and as a consequence this license is subject to overriding obligations to the Federal Government under 35 U.S.C. §§ 200-212 and applicable regulations;

WHEREAS, the First, Second, Third, Fourth, Fifth, Sixth, and Seventh Inventors are all obligated under UNIVERSITY's Patent Policy to assign all of their right, title and interest in the Invention to UNIVERSITY;

WHEREAS, UNIVERSITY has granted to a first commercial entity a non-exclusive license and under UNIVERSITY's patent applications covering the First Invention to practice the methods and to make and use the compositions claimed therein for in-house research not including gene therapy;

WHEREAS, UNIVERSITY has granted to a second commercial entity ("SM Licensee") a non-exclusive license and under UNIVERSITY's patent applications covering the First Invention to practice the methods and to make and use the compositions claimed therein for in-house research not including gene therapy, and an exclusive license under UNIVERSITY's patent applications covering the Second, Third and Fourth invention to practice the methods claimed therein and to make, use, sell, offer for sale and import compositions which are non-peptide, non-protein molecules useful for the treatment or prevention of cardiovascular disease and excluding gene therapy;

WHEREAS, UNIVERSITY had previously granted to a third commercial entity ("Optionee") an exclusive option under UNIVERSITY's patent applications covering the Seventh Invention for evaluation purposes and the option has since elapsed and UNIVERSITY has no further obligations to Optionee;

WHEREAS, UNIVERSITY is desirous that the First, Second, Third, Fourth, Fifth, Sixth, and Seventh Invention (collectively, the "Inventions") be developed and utilized to the fullest possible extent so that its benefits can be enjoyed by the general public;

WHEREAS, LICENSEE is desirous of obtaining certain rights from UNIVERSITY for commercial development, use, manufacture and sale of the Inventions, and the UNIVERSITY is willing to grant such rights; and

WHEREAS, LICENSEE understands that UNIVERSITY may publish or otherwise disseminate information concerning the Inventions at any time and that LICENSEE is paying consideration thereunder for its early access to the Inventions, not continued secrecy therein.

NOW, THEREFORE, the parties agree:

ARTICLE 1. DEFINITIONS.

The terms, as defined herein, shall have the same meanings in both their singular and plural forms.

1.1 “Affiliate” means any corporation or other business entity in which LICENSEE owns or controls, directly or indirectly, at least twenty percent (20%) of the outstanding stock or other voting rights entitled to elect directors, or in which LICENSEE is owned or controlled, directly or indirectly, by at least twenty percent (20%) of the outstanding stock or other voting rights entitled to elect directors; but in any country where the local law does not permit foreign equity participation of at least twenty percent (20%), then an “Affiliate” includes any company in which LICENSEE owns or controls or is owned or controlled by, directly or indirectly, the maximum percentage of outstanding stock or voting rights permitted by local law.

1.2 “Field” means gene therapy for the treatment or prevention of cardiovascular diseases by the delivery of a gene or a synthetic equivalent (DNA, deoxyribonucleic acid or polydeoxyribonucleotide sequence), in whole or in part or in combination, including those encoding one or more phospholamban genes and/or SERCA-2 (sacroplasmic reticulum calcium ATPase) genes, or their mutants, excepting the involvement of anti-sense RNA (ribonucleic acid or polyribonucleotide sequence) of the phospholamban gene.

1.3 “First Patent Rights” means any of the following: the US Patent Application, Serial No [...***...], entitled “[...***...]”, disclosing and claiming the First Invention, filed on September 10, 1999 by the First Inventors and assigned to University; continuing applications of this US patent application including divisions, substitutions, and continuations-in-part (but only to extent the claims thereof are enabled by disclosure of the parent application); any patents issuing on said applications including reissues, reexaminations and extensions; and any corresponding foreign applications or patents.

1.4 “Fourth Patent Rights” means any of the following: the US Patent Application, Serial No. [...***...], titled “[...***...]”, disclosing and claiming the Seventh Invention, filed on April 11, 1995 by the Seventh Inventors and assigned to University; continuing applications of this US patent application including divisions, substitutions, and continuations-in-part (but only to extent the claims thereof are enabled by disclosure of the parent application); any patents issuing on said applications including reissues, reexaminations and extensions; and any corresponding foreign applications or patents.

1.5 “Licensed Method” means any method that is covered by Patent Rights the use of which would constitute, but for the license granted to LICENSEE under this Agreement, an infringement of any pending or issued and unexpired claim within Patent Rights.

1.6 “Licensed Product” means any composition or product that is covered by the claims of Patent Rights, or that is produced by a Licensed Method, or the manufacture, use, sale, offer for sale, or importation of which would constitute, but for the license granted to LICENSEE under this Agreement, an infringement of any pending or issued and unexpired claim within the Patent Rights.

1.7 “Net Sales” means the total of the gross invoice prices of Licensed Products sold by LICENSEE, Affiliates, or Sublicensees, less the sum of the following actual and customary deductions where applicable and separately listed, cash, trade, or quantity discounts; sales, use, tariff, import/export duties or other excise taxes imposed on particular sates (except for value-added and income taxes imposed on the sales of Licensed Products in foreign countries); transportation charges; or credits to customers because of rejections or returns. For purposes of calculating Net Sales, transfers by LICENSEE to a Sublicensee or an Affiliate of Licensed Products under this Agreement for (i) end use (but not resale) by such Sublicensee or Affiliate shall be treated as sales by LICENSEE at list price of LICENSEE, or (ii) resale by such Sublicensee or Affiliate shall be treated as sales at the list price of such Sublicensee or Affiliate.

1.8 “Patent Costs” means all out-of-pocket expenses of UNIVERSITY (and for which UNIVERSITY has not obtained reimbursement from SM Licensee and Optionee) for the preparation, filing, prosecution, and maintenance of all US and foreign patent applications and patents included in Patent Rights. Patent Costs shall also include reasonable out-of-pocket expenses for patentability opinions, inventorship determinations, preparation and prosecution of patent applications, and reexamination, reissue, interference, and opposition activities related to patents or applications in Patent Rights.

1.9 “Patent Rights” mean any or all or any combination of First, Second, Third, and Fourth Patent Rights.

1.10 “Second Patent Rights” means any of the following: the International Application No. [...***...], entitled “[...***...]

[...***...]", disclosing and claiming the Second Invention, Third Invention and Fourth Invention, filed on November 2, 1999 by the Second Inventors, Third Inventors and Fourth Inventors and assigned to UNIVERSITY; the US patent application arising from this international application; continuing applications of this US patent application including divisions, substitutions, and continuations-in-part (but only to extent the claims thereof are enabled by disclosure of the parent application); any patents issuing on said applications including reissues, reexaminations and extensions; and any corresponding foreign applications or patents.

1.11 "Sponsor Rights" means all the applicable provisions of any license to the US Government executed by UNIVERSITY and the overriding obligations to the US Government under 35 U.S.C. §§ 200-212 and applicable governmental implementing regulations.

1.12 "Sublicensee" means a third party to whom LICENSEE grants a sublicense of certain rights granted to LICENSEE under this Agreement.

1.13 "Term" means the period of time beginning on the Effective Date and ending on the expiration date of the longest-lived Patent Rights.

1.14 "Territory" means all countries in the world where Patent Rights exist.

1.15 "Third Patent Rights" means any of the following: the US Patent or Provisional Patent Application filed or to be filed by Fifth Inventors and Sixth Inventors and assigned to UNIVERSITY disclosing and claiming the Fifth Invention and Sixth Invention; continuing applications of this US patent application including divisions, substitutions, and continuations- in-part (but only to extent the claims thereof are enabled by disclosure of the parent application); any patents issuing on said applications including reissues, reexaminations and extensions; and any corresponding foreign applications or patents.

ARTICLE 2. GRANT.

2.1 **License**. Subject to the limitations set forth in this Agreement and Sponsor's Rights, UNIVERSITY hereby grants to LICENSEE, and LICENSEE hereby accepts a license under UNIVERSITY's interest in Patent Rights to make, use, sell, offer for sale, and import Licensed Products and to practice Licensed Methods in the Field, within the Territory and during the Term.

The licenses granted in this paragraph is exclusive with respect to the Field only and UNIVERSITY shall not grant to third parties a further license under UNIVERSITY's interest in Patent Rights in the Field, within the Territory and during the Term, as long as LICENSEE's then existing license has not been made non-exclusive as provided for under Paragraph 3.3(b).

2.2 Sublicense.

(a) The license granted in Paragraph 2.1 hereof includes the right of LICENSEE to grant sublicenses to third parties during the Term but only for as long the license is exclusive.

(b) With respect to sublicenses granted pursuant to Paragraph 2.2(a) hereof, LICENSEE shall:

(1) not receive, or agree to receive, anything of value in lieu of cash as consideration from a third party under a sublicense granted pursuant to Paragraph 2.2(a) without the express written consent of UNIVERSITY; and

(2) to the extent applicable, include all of the tights of and obligations due to UNIVERSITY (and, if applicable, the Sponsor's Rights) and contained in this Agreement; and

(3) promptly provide UNIVERSITY with a copy of each sublicense issued; and

(4) collect and guarantee payment of all payments due, directly or indirectly, to UNIVERSITY from Sublicensees and summarize and deliver all reports due, directly or indirectly, to UNIVERSITY from Sublicensees.

(c) Upon termination of this Agreement for any reason, UNIVERSITY, at its sole discretion, shall determine whether LICENSEE shall cancel or assign to UNIVERSITY any and all sublicenses

2.3 **Reservation of Rights**. UNIVERSITY reserves the right to:

(a) use Inventions and Patent Rights in the Field and within the Territory for educational and research purposes;

(b) publish or otherwise disseminate any information about the Inventions at any time; and

(c) allow other nonprofit institutions to use Inventions and Patent Rights for educational and non-commercial research purposes in their facilities.

ARTICLE 3. CONSIDERATION.

3.1 **Fees and Royalties**. The parties hereto understand that the fees and royalties payable by LICENSEE to UNIVERSITY under this Agreement are partial consideration for the licenses granted herein to LICENSEE under First Patent Rights and Second Patent Rights. LICENSEE shall pay UNIVERSITY:

(a) In recognition of LICENSEE being a startup business and partially in lieu of cash, a license issue fee in the form of Eight Hundred Thousand (800,000) shares of the Twenty Million (20,000,000) shares of common stock authorized for issuance in LICENSEE's Articles of Incorporation dated December 26, 2000; and such stock shall be delivered to UNIVERSITY within sixty (60) days of the Effective Date in the name of "Shellwater & Co.", a nominee of UNIVERSITY, provided however, that the acceptance of LICENSEE's common stock in this paragraph and in paragraph 3.1(e) below is subject to.

(i) the final approval of the Office of the President of UNIVERSITY, and, in the event that such an approval is not granted, this Agreement shall remain in effect and LICENSEE and UCSD shall renegotiate in good faith for a substitution of similar monetary value for consideration;

(ii) LICENSEE and UNIVERSITY enters into a shareholder agreement outlining the rights of UNIVERSITY as a shareholder that is no less favorable to the founders of LICENSEE and is acceptable to the UNIVERSITY, and such rights shall include a "piggyback registration" right and other customary rights of a shareholder; and

(iii) in the event LICENSEE amends or restates its Article of Incorporation of December 26, 2000 prior to a major liquidity event, such as an "initial public offering", a merger, or an acquisition by another company of substantially all of LICENSEE's asset, in a manner that UNIVERSITY's equity holding in this paragraph and in paragraphs 3.1(e)(1) to 3.1(e)(4) below, is disproportionately affected in relation to the holdings of the LICENSEE founders and senior executive officers, LCIENSEE shall do all things necessary and legal to adjust UNIVERSITY's holding to restore the relative proportion;

(b) an earned royalty of [...***...] percent ([...***...]%) on Net Sales of Licensed Products by LICENSEE, or its Affiliate(s); and

(c) [...***...] percent ([...***...]%) of all sublicense fees received by LICENSEE from its Sublicensees that are not earned royalties and are for Patent Rights in Asian Countries only; and [...***...] percent ([...***...]%) of all sublicense fees received by LICENSEE from its Sublicensses that are not earned royalties and include Patent Rights in non-Asian Countries; and

(d) on each and every sublicense royalty payment received by LICENSEE from its Sublicensees on sales of Licensed Products by Sublicensees, the higher of (i) fifty percent (50%) of the royalties received by LICENSEE; or (ii) royalties based on the royalty rate in Paragraph 3.1(b) as applied to Net Sales of Sublicensees; and

(e) milestone payments in the amounts payable according to the following schedule or events.

*****Confidential Treatment Requested**

	Amount	Date or Event
(1)	200,000 shares of LICENSEE common stock	LICENSEE receives Two Million Dollars (US$2,000,000) in equity financing;
(2)	200,000 shares of LICENSEE common stock	LICENSEE begins a Phase I clinical trial of a Licensed Product or receives an additional Four Million Dollars (US$4,000,000) in equity financing;
(3)	400,000 shares of LICENSEE common stock	LICENSEE begins a Phase II clinical trial of a Licensed Product or receives an additional Eight Million Dollars (US$8,000,000) in equity financing;
(4)	400,000 shares of LICENSEE common stock	LICENSEE begins a Phase III clinical trial of a Licensed Product or receives an additional Eight Million Dollars (US$8,000,000) in equity financing;
(5)	[...***...]	LICENSEE receives the first US regulatory approval for the sale of a Licensed Product for human therapeutic use;
(6)	[...***...]	LICENSEE receives a US regulatory approval for the sale of each additional Licensed Product for human therapeutic use; and
(7)	[...***...]	LICENSEE receives a non-US regulatory approval for the sale of each Licensed Product outside of the US for human therapeutic use; and

(f) beginning the calendar year of commercial sales of the first License Product by LICENSEE, its Sublicensee, or an Affiliate for human therapeutic use and if the total earned royalties paid by LICENSEE, its Affiliates, and/or Sublicensees under Paragraphs 3.1(b) and (d) to UNIVERSITY in any such year cumulatively amounts to less than Twenty Thousand US Dollars (US$20,000) ("minimum annual royalty"), LICENSEE shall pay to UNIVERSITY a minimum annual royalty on or before February 28 following the last quarter of such year the difference between Twenty Thousand US Dollars (US$20,000) and the total earned royalty paid by LICENSEE for such year under Paragraphs 3.1(b) and (d); provided, however, that for the year of commercial sales of the first Licensed Product, the amount of minimum annual royalty payable shall be prorated for the number of months remaining in that calendar year.

All fees and royalty payments specified in Paragraphs 3.1(b) through 3.1(f) shall be paid by LICENSEE pursuant to Paragraph 4.3 and shall be delivered by LICENSEE to UNIVERSITY pursuant to Paragraph 10.1.

3.2 **Patent Costs**. LICENSEE shall reimburse UNIVERSITY all past (prior to the Effective Date) and future (on or after the Effective Date) Patent Costs plus a [...***...] percent ([...***...]%) patent service fee within thirty (30) days following receipt by LICENSEE of an itemized invoice from UNIVERSITY.

3.3 **Due Diligence**.

(a) LICENSEE shall:

(1) diligently proceed with the development, manufacture and sale of Licensed Products; and

(2) during the time period starting on the day after the third anniversary of the Effective Date and up to the date of first commercial sale of a Licensed Product, LICENSE shall annually spend, or enter into an agreement with a third party who is obligated thereunder to spend, at least [...***...] US Dollars (US$[...***...]) to pursue research and development efforts directed to bringing Licensed Products to market; and

(3) on or before the date ending five (5) years after the Effective Date, file with US FDA an IND (or its equivalent in a foreign country) for a Licensed Product; and

(4) on or before the date ending seven (7) years after the Effective Date, commence in the US a Phase II clinical trial (or its equivalent in a foreign country) for a Licensed Product; and

(5) on or before the date ending nine (9) years after the Effective Date, commence Phase III clinical trial (or its equivalent in a foreign country) for first Licensed Product; and

(6) on or before the date ending twelve (12) years after the Effective Date file with US FDA an NDA or PLA (or its equivalent in a foreign country) for a Licensed Product; and

(7) market a Licensed Product in the US within six (6) months after receiving regulatory approval to market such Licensed Product; and

(8) use commercially reasonable efforts to fill the market demand for Licensed Products following commencement of marketing at any time during the term of this Agreement; and

(9) obtain all necessary governmental approvals for the manufacture, use and sale of Licensed Products

(b) If LICENSEE fails to perform any of its obligations specified in Paragraphs 3.3(a)(1) through 3.1(a)(9) hereof, then UNIVERSITY shall have the right and option to either terminate this Agreement or change LICENSEE's exclusive license to a nonexclusive license. This right, if exercised by UNIVERSITY, supersedes the rights granted in Article 2 (GRANT) hereof.

ARTICLE 4. REPORTS, RECORDS AND PAYMENTS.

4.1 **Reports**.

(a) **Progress Reports**.

(1) Beginning June 1, 2001 and ending on the date of first commercial sale of a Licensed Product in the United States, LICENSEE shall submit to UNIVERSITY semi-annual progress reports covering LICENSEE's (and Affiliate's and Sublicensee's) activities to develop and test all Licensed Products and obtain governmental approvals, necessary for marketing the same. Such reports shall include a summary of work completed; summary of work in progress; current schedule of anticipated events or milestones; market plans for introduction of Licensed Products; and summary of resources (dollar value) spent in the reporting period.

(2) LICENSEE shall also report to UNIVERSITY, in its immediately subsequent progress report, the date of first commercial sale of a Licensed Product in each country.

(b) **Royalty Reports**. After the date of first commercial sale of a Licensed Product anywhere in the world, LICENSEE shall submit to UNIVERSITY quarterly royalty reports on or before each February 28, May 31, August 31 and November 30 of each year. Each royalty

report shall cover LICENSEE's (and each Affiliate's and Sublicensee's) most recently completed calendar quarter and shall show:

(1) the gross sales, deductions as provided in Paragraph 1.6, and Net Sales during the most recently completed calendar quarter and the royalties, in US dollars, payable with respect thereto; and

(2) the quantities (in sale unit) and receipts of each type of Licensed Product sold; and

(3) sublicense fees and royalties received during the most recently completed calendar quarter in US dollars; and

(4) the method used to calculate the royalties, and

(5) the exchange rates used.

If no sales of Licensed Products has been made and LICENSEE has received no sublicense revenues during any reporting period, LICENSEE shall so report.

4.2 **Records & Audits**.

(a) LICENSEE shall keep, and shall require its Affiliates and Sublicensees to keep, accurate and correct records of all Licensed Products manufactured, used, and sold, and sublicense fees received under this Agreement. Such records shall be retained by LICENSEE for at least five (5) years following a given reporting period.

(b) All records shall be available during normal business hours for inspection, at the expense of UNIVERSITY, by UNIVERSITY's Internal Audit Department or by a Certified Public Accountant selected by UNIVERSITY and in compliance with the other terms of this Agreement for the sole purpose of verifying the accuracy of reports and payments. Such inspector shall not disclose to UNIVERSITY any information other than information relating to the accuracy of reports and payments made under this Agreement. In the event that any such inspection shows an under reporting and underpayment in excess of five percent (5%) for any twelve (12) month period, then LICENSEE shall pay the cost of the inspection as well as any additional sum that would have been payable to UNIVERSITY had the LICENSEE reported correctly, plus an interest charge at a rate of ten percent (10%) per year. Such interest shall be calculated from the date the correct payment was due to UNIVERSITY up to the date when such payment is actually made by LICENSEE. For underpayment not in excess of five percent (5%) for any twelve (12) month period, LICENSEE shall pay the difference due to UNIVERSITY within thirty (30) days without interest charge or inspection cost.

4.3 **Payments**.

(a) All fees and royalties due UNIVERSITY shall be paid in US Dollars and all checks shall be made payable to “The Regents of the University of California”, referencing UNIVERSITY’ taxpayer identification number, 95-6006144.

(b) **Royalty Payments**.

(1) Royalties shall accrue when Licensed Products are invoiced, or if not invoiced, when delivered to a third party or Affiliate.

(2) LICENSEE shall pay earned royalties quarterly on or before February 28, May 31, August 31 and November 30 of each calendar year. Each such payment shall be for earned royalties accrued within LICENSEE’s most recently completed calendar quarter.

(3) When Licensed Products are sold in currencies other than US Dollars, LICENSEE shall first determine the earned royalty in the currency of the country in which Licensed Products were sold and then convert the amount into equivalent US Dollars, using the exchange rate quoted in the Wall Street Journal on the last business day of the applicable reporting period.

(4) Royalties earned on sales occurring or under sublicense granted pursuant to this Agreement in any country outside the US shall not be reduced by LICENSEE for any taxes, fees, or other charges imposed by the government of such country on the payment of royalty income, except that all payments made by LICENSEE in fulfillment of UNIVERSITY’ tax liability in any particular country may be credited against earned royalties or fees due UNIVERSITY for that country. LICENSEE shall pay all bank charges resulting from the transfer of such royalty payments.

(5) If at any time legal restrictions prevent the prompt remittance of part or all royalties by LICENSEE with respect to any country where a Licensed Product is sold or a sublicense is granted pursuant to this Agreement, LICENSEE shall convert the amount owed to UNIVERSITY into US currency and shall pay UNIVERSITY directly from its US source of funds for as long as the legal restrictions apply.

(6) In the event that any patent or patent claim within Patent Rights is held invalid in a final decision by a patent office from which no appeal or additional patent prosecution has been or can be taken, or by a court of competent jurisdiction and last resort and from which no appeal has been or can be taken, all obligation to pay royalties based solely on that patent or claim or any claim patentably indistinct therefrom shall cease as of the date of such final decision. LICENSEE shall not, however, be relieved from paying any royalties that accrued before the date of such final decision, or that are based on another patent or claim not involved in such final decision, or that are based on the use of Technology.

(c) **Late Payments**. In the event royalty, reimbursement and/or fee payments are not received by UNIVERSITY when due, LICENSEE shall pay to UNIVERSITY interest charges at a rate of ten percent (10%) per year. Such interest shall be calculated from the date payment was due until actually received by UNIVERSITY.

ARTICLE 5. PATENT MATTERS.

5.1 **Patent Prosecution and Maintenance.**

(a) Provided that LICENSEE has reimbursed UNIVERSITY for Patent Costs pursuant to Paragraph 3.2 hereof, UNIVERSITY shall diligently prosecute and maintain the US and, if available, foreign patents, and applications in Patent Rights using counsel of its choice. UNIVERSITY shall provide LICENSEE with copies of all relevant documentation relating to such prosecution and LICENSEE shall keep this documentation confidential. The counsel shall take instructions only from UNIVERSITY, and all patents and patent applications in Patent Rights shall be assigned solely to UNIVERSITY.

(b) UNIVERSITY shall consider amending any patent application in Patent Rights to include claims reasonably requested by LICENSEE to protect the products contemplated to be sold by LICENSEE under this Agreement

(c) LICENSEE shall apply for an extension of the term of any patent in Patent Rights if appropriate under the Drug Price Competition and Patent Term Restoration Act of 1984 and/or European, Japanese and other foreign counterparts of this law. LICENSEE shall prepare all documents for such application, and UNIVERSITY shall execute such documents and to take any other additional action as LICENSEE reasonably requests in connection therewith.

(d) LICENSEE, may elect to terminate its reimbursement obligations with respect to any patent application or patent in Patent Rights upon three (3) months' written notice to UNIVERSITY. UNIVERSITY shall use reasonable efforts to curtail further Patent Costs for such application or patent when such notice of termination is received from LICENSEE. UNIVERSITY, in its sole discretion and at its sole expense, may continue prosecution and maintenance of such application or patent, and LICENSEE shall then have no further license with respect thereto. Non-payment of any portion of Patent Costs with respect to any application or patent may be deemed by UNIVERSITY as an election by LICENSEE to terminate its reimbursement obligations with respect to such application or patent, as well as LICENSEE's rights thereto under this Agreement.

5.2 **Patent Infringement.**

(a) If LICENSEE learns of any substantial infringement of Patent Rights, LICENSEE shall so inform UNIVERSITY and provide UNIVERSITY with reasonable evidence of the

infringement. Neither party shall notify a third party of the infringement of Patent Rights without the consent of the other party. Both parties shall use reasonable efforts and cooperation to terminate infringement without litigation.

(b) LICENSEE may request UNIVERSITY to take legal action against such third party for the infringement of Patent Rights, Such request shall be made in writing and shall include reasonable evidence of such infringement and damages to LICENSEE. If the infringing activity has not abated ninety (90) days following LICENSEE's request, UNIVERSITY shall elect to or not to commence suit on its own account. UNIVERSITY shall give notice of its election in writing to LICENSEE by the end of the one-hundredth (100th) day after receiving notice of such request from LICENSEE. LICENSEE may thereafter bring suit for patent infringement at its own expense, if and only if, UNIVERSITY elects not to commence suit and the infringement occurred in a jurisdiction where LICENSEE has an exclusive license under this Agreement. If LICENSEE elects to bring suit, UNIVERSITY may join that suit at its own expense.

(c) Recoveries from actions brought pursuant to paragraph 5 2(b) shall belong to the party bringing suit. Legal actions brought jointly by UNIVERSITY and LICENSEE and fully participated in by both shall be at the joint expense of the parties and all recoveries shall be shared jointly by them in proportion to the share of expenses paid by each party

(d) Each party shall cooperate with the other in litigation proceedings at the expense of the party bringing suit. Litigation shall be controlled by the party bringing the suit, except that UNIVERSITY may be represented by counsel of its choice in any suit brought by LICENSEE.

5.3 **Patent Marking**. LICENSEE shall mark all Licensed Products made, used or sold under the terms of this Agreement, or their containers, in accordance with the applicable patent marking laws.

ARTICLE 6. GOVERNMENTAL MATTERS.

6.1 **Governmental Approval or Registration**. If this Agreement or any associated transaction is required by the law of any nation to be either approved or registered with any governmental agency, LICENSEE shall assume all legal obligations to do so. LICENSEE shall notify UNIVERSITY if it becomes aware that this Agreement is subject to a US or foreign government reporting or approval requirement. LICENSEE shall make all necessary filings and pay all costs including fees, penalties, and all other out-of-pocket costs associated with such reporting or approval process.

6.2 **Export Control Laws**. LICENSEE shall observe all applicable United States and foreign laws with respect to the transfer of Licensed Products and related technical data to foreign

countries, including, without limitation, the International Traffic in Arms Regulations and the Export Administration Regulations.

6.3 **Preference for United States Industry**. If LICENSEE sells a Licensed Product [or Combination Product] in the US, LICENSEE shall manufacture such product substantially in the US.

ARTICLE 7. TERMINATION OF THE AGREEMENT.

7.1 **Termination by UNIVERSITY**. If LICENSEE fails to perform or violates any term of this Agreement, then UNIVERSITY may give written notice of default ("Notice of Default") to LICENSEE. If LICENSEE fails to cure the default within sixty (60) days of the effective date of such Notice of Default, UNIVERSITY may terminate this Agreement and the license granted herein by a second written notice ("Notice of Termination") to LICENSEE. If a Notice of Termination is sent to LICENSEE, this Agreement shall automatically terminate on the effective date of that notice. Termination shall not relieve LICENSEE of its obligation to pay any fees owed at the time of termination and shall not impair any accrued right of UNIVERSITY.

7.2 **Termination by LICENSEE**.

(a) LICENSEE shall have the right at any time and for any reason to terminate this Agreement upon a ninety (90) day written notice to UNIVERSITY. Such notice shall state LICENSEE's reason for terminating this Agreement.

(b) Any termination under Paragraph 7.2(a) hereof shall not relieve LICENSEE of any obligation or liability accrued under this Agreement prior to termination, or rescind any payment made to UNIVERSITY or action by LICENSEE prior to the time termination becomes effective. Termination shall not affect in any manner any rights of UNIVERSITY arising under this Agreement prior to termination.

7.3 **Survival on Termination**. The following Paragraphs and Articles hereof shall survive the termination of this Agreement:

(a) Article 4 (REPORTS, RECORDS AND PAYMENTS); and

(b) Paragraph 7.4 (Disposition of Licensed Products on Hand); and

(c) Paragraph 8.2 (Indemnification); and

(d) Article 9 (USE OF NAMES AND TRADEMARKS), and

(e) Paragraph 10.2 (Secrecy); and

(f) Paragraph 10.5 (Failure to Perform).

7.4 **Disposition of Licensed Products on Hand**. Upon termination of this Agreement, LICENSEE may dispose of all previously made or partially made Licensed Products within a period of one hundred and twenty (120) days of the effective date of such termination provided that the sale of such Licensed Product by LICENSEE, its Sublicensees, or Affiliates shall be subject to the terms of this Agreement, including but not limited to the rendering of reports and payment of royalties required under this Agreement.

ARTICLE 8. LIMITED WARRANTY AND INDEMNIFICATION.

8.1 **Limited Warranty**.

(a) UNIVERSITY warrants that it has the lawful right to grant these licenses.

(b) The licenses granted herein are provided "AS IS" and WITHOUT WARRANTY OF MERCHANTABILITY or WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE or any other warranty, express or implied. UNIVERSITY makes no representation or warranty that the Licensed Products, Licensed Methods or the use of First Patent Rights or Second Patent Rights will not infringe any other patent or other proprietary rights.

(c) In no event shall UNIVERSITY be liable for any incidental, special or consequential damages resulting from exercise of the licenses granted herein or the use of the First Invention, Second Invention, Third Invention, Fourth Invention, Fifth Invention or Sixth Invention, a Licensed Product or a Licensed Method.

(d) Nothing in this Agreement shall be construed as:

(1) a warranty or representation by UNIVERSITY as to the validity or scope of any First Patent Rights or Second Patent Rights, or

(2) a warranty or representation that anything made, used, sold or otherwise disposed of under any license granted in this Agreement is or shall be free from infringement of patents of third parties; or

(3) an obligation to bring or prosecute actions or suits against third parties for patent infringement, except as provided in Paragraph 5.2 hereof; or

(4) conferring by implication, estoppel or otherwise any license or rights under any patents of UNIVERSITY other than Patent Rights, regardless of whether those patents are dominant or subordinate to Patent Rights; or

(5) an obligation to furnish any know-how not provided in First Patent Rights and Second Patent Rights.

8.2 **Indemnification**,

(a) LICENSEE shall indemnify, hold harmless and defend UNIVERSITY, its officers, employees, and agents; the sponsors of the research that led to the First Invention, Second Invention, Third Invention, Fourth Invention, Fifth Invention, and Sixth Invention; and the named inventors of the patents and patent applications in First Patent Rights and Second Patent Rights and their employers against any and all claims, suits, losses, damage, costs, fees, and expenses resulting from or arising out of exercise of this license or any sublicense. This indemnification shall include, but not be limited to, any product liability.

(b) LICENSEE, at its sole cost and expense, shall insure its activities in connection with the work under this Agreement and obtain, keep in force and maintain insurance or an equivalent program of self insurance as follows:

(1) comprehensive or commercial general liability insurance (contractual liability included) with limits of at least:

(i) each occurrence, $1,000,000; and

(ii) products/completed operations aggregate, $5,000,000, and

(iii) personal and advertising injury, $1,000,000; and

(iv) general aggregate (commercial form only), $5,000,000; and

(2) the coverage and limits referred to above shall not in any way limit the liability of LICENSEE.

(c) LICENSEE shall furnish UNIVERSITY with certificates of insurance showing compliance with all requirements with its first annual report. Such certificates shall:

(1) provide for thirty (30) day advance written notice to UNIVERSITY of any modification; and

(2) indicate that UNIVERSITY has been endorsed as an additional insured under the coverage referred to above; and

(3) include a provision that the coverage shall be primary and shall not participate with nor shall be excess over any valid and collectable insurance or program of self-insurance carried or maintained by UNIVERSITY.

(d) UNIVERSITY shall notify LICENSEE in writing of any claim or suit brought against UNIVERSITY in respect of which UNIVERSITY intends to invoke the provisions of this Article. LICENSEE shall keep UNIVERSITY informed on a current basis of its defense of any claims under this Paragraph.

ARTICLE 9. USE OF NAMES AND TRADEMARKS.

9.1 Nothing contained in this Agreement confers any right to use in advertising, publicity, or other promotional activities any name, trade name, trademark, or other designation of either party hereto (including contraction, abbreviation or simulation of any of the foregoing). Unless required by law, the use by LICENSEE of the name, “The Regents of the University of California” or the name of any campus of the University Of California is prohibited, without the express written consent of UNIVERSITY.

9.2 UNIVERSITY may disclose to the First Inventor, Second Inventor, Third Inventor, Fourth Inventor, Fifth Inventor, Sixth Inventor, or any of them the terms and conditions of this Agreement upon their request. If such disclosure is made, UNIVERSITY shall request the Inventors not disclose such terms and conditions to others

9.3 UNIVERSITY may acknowledge the existence of this Agreement and the extent of the grant in Article 2 (GRANT) hereof to third parties, but UNIVERSITY shall not disclose the financial terms of this Agreement to third parties, except where UNIVERSITY is required by law to do so, such as under the California Public Records Act.

ARTICLE 10. MISCELLANEOUS PROVISIONS.

10.1 **Correspondence**. Any notice or payment required to be given to either party under this Agreement shall be deemed to have been properly given and effective,

(a) on the date of delivery if delivered in person, or

(b) five (5) days after mailing if mailed by first-class or certified mail, postage paid, to the respective addresses given below, or to such other address as is designated by written notice given to the other party:

If sent to UNIVERSITY:
UCSD Technology Transfer and
Intellectual Property Services
9500 Gilman Drive
La Jolla, CA 92093-0910
Attention: Director
Telephone: 858-534-5815
Facsimile: 858-534-7345

For Courier:
UCSD TTIPS
10300 North Torrey Pines Road
Torrey Pines Center North, 1st F.
La Jolla, CA 92093

If sent to LICENSEE:
Celladon Corporation
9445 La Jolla Farms Road
La Jolla, CA 92037

Attention: Dr. Shu Chien

10.2 **Secrecy**.

(a) "Confidential Information" shall mean information relating to the Invention and disclosed by UNIVERSITY to LICENSEE during the term of this Agreement, which if first disclosed in writing shall be marked "Confidential", or if first disclosed otherwise, shall within thirty (30) days of such disclosure be reduced to writing by UNIVERSITY, marked "Confidential" and sent to LICENSEE:

(b) LICENSEE shall:

(1) use the Confidential Information for the sole purpose of performing under the terms of this Agreement; and

(2) safeguard Confidential Information against disclosure to others with the same degree of care as it exercises with its own data of a similar nature; and

(3) not disclose Confidential Information to others (except to its employees, agents or consultants who are bound to LICENSEE by a like obligation of confidentiality) without the express written consent of UNIVERSITY, except that LICENSEE shall not be prevented from using or disclosing any of the Confidential Information that:

(i) LICENSEE can demonstrate by written records was previously known to it;

(ii) is now, or becomes in the future, public knowledge other than through acts or omissions of LICENSEE; or

(iii) is lawfully obtained by LICENSEE from sources independent of UNIVERSITY.

(c) The secrecy obligations of LICENSEE with respect to Confidential Information shall continue for a period ending five (5) years from the termination date of this Agreement.

10.3 **Assignability**. This Agreement may be assigned by UNIVERSITY, but is personal to LICENSEE and assignable by LICENSEE only with the written consent of UNIVERSITY.

10.4 **No Waiver**. No waiver by either party of any breach or default of any covenant or agreement set forth in this Agreement shall be deemed a waiver as to any subsequent and/or similar breach or default.

10.5 **Failure to Perform**. In the event of a failure of performance due under this Agreement and if it becomes necessary for either party to undertake legal action against the other on account thereof, then the prevailing party shall be entitled to reasonable attorney's fees in addition to costs and necessary disbursements.

10.6 **Governing Laws**. THIS AGREEMENT SHALL BE INTERPRETED AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF CALIFORNIA, but the scope and validity of any patent or patent application shall be governed by the applicable laws of the country of the patent or patent application.

10.7 **Force Majeure**. A party to this Agreement may be excused from any performance required herein, if such performance is rendered impossible or unfeasible due to any catastrophe or other major event beyond its reasonable control, including, without limitation, war, riot, and insurrection; laws, proclamations, edicts, ordinances, or regulations; strikes, lockouts, or other serious labor disputes; and floods, fires, explosions, or other natural disasters. When such events have abated, the non-performing party's obligations herein shall resume.

10.8 **Headings**. The headings of the several sections are inserted for convenience of reference only and are not intended to be a part of or to affect the meaning or interpretation of this Agreement.

10.9 **Written Agreement**. This Agreement is not binding on the parties until it has been signed below on behalf of each party. It shall be effective as of the Effective Date.

10.10 **Entire Agreement**. This Agreement embodies the entire understanding of the parties and supersedes all previous communications, representations or understandings, either oral or written, between the parties relating to the subject matter hereof.

10.11 **Amendments**. No amendment or modification of this Agreement shall be valid or binding on the parties unless made in writing and signed on behalf of each party.

10.12 **Severability**. In the event that any of the provisions contained in this Agreement is held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions or this Agreement, and this Agreement shall be construed as if the invalid, illegal, or unenforceable provisions had never been contained in it.

IN WITNESS WHEREOF, both UNIVERSITY and LICENSEE have executed this Agreement, in duplicate originals, by their respective and duly authorized officers on the day and year written.

CELLADON CORPORATION

By /s/ Dr. Shu Chien
(Signature)
Name: Dr. Shu Chien
Title: CEO
Date: February 10, 2001

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA:

By /s/ Dr. Alan S. Paau
(Signature)
Name: Dr. Alan S. Paau
Title: Director, UCSD TTIPS
Date: February 9, 2001

* * * * * End of Document * * * * *

AMENDMENT NO. 1 TO THE LICENSE AGREEMENT
EFFECTIVE FEBRUARY 10, 2001
BETWEEN
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
AND
CELLADON CORPORATION

This amendment ("Amendment") is made by and between Celladon Corporation, a California corporation having a business address at 9445 La Jolla Farms Road, La Jolla, California 92037 ("CELLADON") and The Regents Of The University Of California, a California corporation, having its statewide administrative offices at 1111 Franklin Street, 12th Floor, Oakland, California 94607-5200 ("UNIVERSITY"), represented by its San Diego campus having an address at University of California, San Diego, Technology Transfer and Intellectual Property Services, 9500 Gilman Drive, La Jolla, California 92093-0910.

This Effective Date of this Amendment is the date of the last signature.

BACKGROUND

WHEREAS, CELLADON has entered into a License Agreement ("LICENSE') with the UNIVERSITY effective February 10, 2001 wherein CELLADON was granted certain patent and license rights;

WHEREAS, CELLADON and UNIVERSITY wish to amend the LICENSE to correct certain errors in the LICENSE.

NOW THEREFORE, CELLADON and UNIVERSITY agree to amend the LICENSE to include certain modifications. These changes are to be substituted for those relevant paragraphs in the LICENSE and are effective on the Effective Date. For these purposes, changes are made as detailed below to the following Articles of the LICENSE;

1. The first paragraph of Article 3.1 is replaced in its entirety with:

"3.1 Fees and Royalties. The parties hereto understand that the fees and royalties payable by LICENSEE to UNIVERSITY under this Agreement are partial consideration for the licenses granted herein to LICENSEE under Patent Rights. LICENSEE shall pay UNIVERSITY:"

2. Articles 3.1(e)(2) to 3.1(e)(4) are replaced in their entirety with:

"(2)	200,000 shares of LICENSEE common stock	LICENSEE begins a Phase I clinical trial of a Licensed Product;
(3)	400,000 shares of LICENSEE common stock	LICENSEE begins a Phase II clinical trial of a Licensed Product;
(4)	400,000 shares of LICENSEE common stock	LICENSEE begins a Phase III clinical trial of a Licensed Product;"

3. Article 8.1(d)(5) is replaced in its entirety with;

"(5) an obligation to furnish any know-how not provided in Patent Rights."

All other terms and conditions in the LICENSE between CELLADON and UNIVERSITY effective February 10, 2001 shall remain unchanged and in effect.

IN WITNESS WHEREOF, both UNIVERSITY and LICENSEE have executed this Agreement, in duplicate originals, by their respective and duly authorized officers on the day and year written.

CELLADON CORPORATION

By /s/ Dr. Shu Chien
(Signature)
Name: Dr. Shu Chien
Title: CEO
Date: March 6, 2001

THE REGENTS OF THE
UNIVERSITY OF CALIFORNIA:

By /s/ Dr. Alan S. Paau
(Signature)
Name: Dr. Alan S. Paau
Title: Director, UCSD TTIPS
Date: February 27, 2001

AMENDMENT NO 2 TO THE LICENSE AGREEMENT
EFFECTIVE FEBRUARY 10, 2001
BETWEEN
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
AND
CELLADON CORPORATION

This Amendment (the "***Amendment***") to the License Agreement dated February 10, 2001 between Celladon Corporation, a California corporation having an address at 2223 Avenida de la Playa, Suite 300, c/o Enterprise Partners Venture Capital, La Jolla, CA 92037 ("***LICENSEE***"), and The Regents Of The University Of California, a California corporation having its statewide administrative offices at 1111 Franklin Street, Oakland, California 94607-5200, as represented by its San Diego campus having an address at University of California, San Diego, Technology Transfer & Intellectual Property Services, Mail-code 0910, 9500 Gilman Drive, La Jolla, California 92093-0910 (collectively, "***UNIVERSITY***"), as amended March 6, 2001 (collectively, the "***Agreement***"), is entered into and effective as of January 21, 2005 (the "***Amendment Date***"). Capitalized terms used but not otherwise defined herein shall have the meanings provided in the Agreement.

WHEREAS, the parties wish to amend certain provisions of the Agreement, subject to the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Celladon Stock. Effective as of the Amendment Date, and subject to payment by LICENSEE of the Amendment Fee (as defined in section 2 of this Amendment), UNIVERSITY agrees to surrender, within thirty (30) days of receipt of the Amendment Fee, to LICENSEE for cancellation, and waives its rights to, any and all shares of LICENSEE common stock previously issued, or to be issued, to UNIVERSITY pursuant to Articles 3.1(a) and 3.1(e)(1) of the Agreement. Within 30 days following the Amendment Date, UNIVERSITY shall deliver to LICENSEE all stock certificates in UNIVERSITY's possession or control representing such shares. UNIVERSITY represents and warrants to LICENSEE that UNIVERSITY did not receive, or is not in possession of, stock certificate(s) representing all of the foregoing shares. Should any such stock certificate(s) hereafter come into UNIVERSITY's possession or control, UNIVERSITY will promptly deliver and surrender such certificate(s) to LICENSEE. UNIVERSITY hereby acknowledges and agrees that, after the Amendment Date, the only shares of LICENSEE capital stock to which it is or may be entitled are the shares of LICENSEE common stock issuable upon achievement of the milestones specified in Paragraphs 3.1(e)(2), 3.1(e)(3) and 3.1(e)(4) of the Agreement (as amended by this Amendment) and such shares were subject to the 0.1741966-for-one stock split effected on September 29, 2004 (the "***Stock Split***").

2. Amendment Fee. Within 30 days after the Amendment Date, LICENSEE shall pay to UNIVERSITY an amendment fee of $114,455.00 (the "***Amendment Fee***"). In addition, LICENSEE shall reimburse UNIVERSITY for past-due Patent Costs of approximately $86,000 within 30 days after receipt of an itemized invoice from UNIVERSITY.

3. Amendment to Paragraph 1.7. Paragraph 1.7 of the Agreement is hereby amended to add the following new paragraph after the existing definition of Net Sales:

> "With respect to a Licensed Product that contains an active ingredient covered by the Patent Rights in combination with one or more other Active Ingredients (collectively, a "Combination Product"), Net Sales shall be calculated by multiplying the Net Sales of such Combination Product, calculated in accordance with the preceding paragraph, by the fraction A/B, where "A" is the price of the Licensed Product included in such Combination Product when sold separately from any other Active Ingredient in such Combination Product, and "B" is the price of the Combination Product. In the event that no market price is available for the Licensed Product included in such Combination Product when supplied or priced separately, UNIVERSITY and LICENSEE shall determine in good faith the fair market value thereof. For purposes of this paragraph, "Active Ingredient" shall mean a therapeutically active ingredient that (a) is not covered by the Patent Rights, and (b) has a different therapeutic activity than the active ingredient covered by the Patent Rights, and (c) can be sold separately as a therapeutic product."

4. Amendment to Paragraph 1.9. Paragraph 1.9 of the Agreement is hereby amended and restated to read in its entirety as follows:

> " "Patent Rights" means and includes: (a) the patents and patent applications listed on Exhibit A hereto; (b) continuing applications of any of the foregoing patent applications, including divisions, substitutions and continuations-in-part (but only to the extent the claims thereof are enabled by disclosure of the parent application); (c) patents issuing on said applications, including reissues, reexaminations and extensions; and (d) any corresponding foreign applications or patents."

5. Amendment to Paragraph 2.1. The first paragraph of Paragraph 2.1 of the Agreement is hereby amended and restated to read in its entirety as follows:

> "Subject to the limitations set forth in this Agreement and Sponsor's Rights, UNIVERSITY hereby grants to LICENSEE, and LICENSEE hereby accepts, a license under UNIVERSITY's interest in Patent Rights to make, have made, use, sell, offer for sale, have sold and import Licensed Products and to practice Licensed Methods in the Field, within the Territory and during the Term."

6. Amendment to Paragraph 2.2(b)(1). Paragraph 2.2(b)(1) of the Agreement is hereby amended and restated to read in its entirety as follows:

"not receive, or agree to receive, anything of value in lieu of cash as consideration from a third party under a sublicense granted pursuant to Paragraph 2.2(a) without converting said value into United States dollars, with notification to UNIVERSITY of the details of said conversion. If UNIVERSITY disagrees with said conversion the parties agree the dispute shall be resolved through binding arbitration under the rules of the American Arbitration Association. The place of arbitration shall be in San Diego and LICENSEE shall be responsible for the costs of the arbitration; and"

7. Amendment to Paragraph 3.1(b). Paragraph 3.1(b) of the Agreement is hereby amended and restated to read in its entirety as follows:

"an earned royalty of [...***...] percent ([...***...]%) on Net Sales of Licensed Products by LICENSEE or its Affiliate(s); *provided*, *however*, that if LICENSEE or any of its Affiliates or Sublicensees, in order to make or have made, use, sell or have sold or otherwise exploit the Licensed Products in any jurisdiction, reasonably determines that it must obtain a license under patent rights of one or more independent third parties such that the total royalty burden (including royalties payable to UNIVERSITY) for such Licensed Product exceeds [...***...]% of Net Sales of such Licensed Product, then LICENSEE will be entitled to deduct from the royalties payable to UNIVERSITY one-sixth of such royalties in excess of [...***...]%; *provided*, *however*, that in no event shall the royalties payable to UNIVERSITY in any quarter be reduced by operation of this provision by more than 50%."

8. Amendment to Paragraph 3.1(c). Paragraph 3.1(c) of the Agreement is hereby amended and restated to read in its entirety as follows:

"[...***...] percent ([...***...]%) of all sublicense fees received by LICENSEE from its Sublicensees that are not earned royalties and are for Patent Rights in Asian Countries only; and [...***...] percent ([...***...]%) of all sublicense fees received by LICENSEE from its Sublicensees that are not earned royalties and are for Patent Rights in non-Asian Countries; *provided*, *however*, that if LICENSEE sublicenses the Patent Rights together with other patent rights not dominated by the Patent Rights, the parties shall negotiate in good faith a reduced sublicense fee percentage payable to UNIVERSITY that is reasonable in light of the relative values of the Patent Rights and the other sublicensed patent rights."

9. Amendment to Paragraph 3.1(e). Paragraphs 3.1(e)(2) through 3.1(e)(4) of the Agreement are hereby amended and restated to read in their entirety as follows:

"(2)	34,839 shares of LICENSEE common stock	LICENSEE begins a Phase 1/2 clinical trial of a Licensed Product;
(3)	69,679 shares of LICENSEE common stock	LICENSEE completes a Phase 1/2 clinical trial of a Licensed Product;
(4)	69,679 shares of LICENSEE	LICENSEE begins a Phase 3 clinical

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common stock trial of a Licensed Product;"

For purposes of clarification, the parties acknowledge and agree that the preceding numbers of shares of LICENSEE common stock reflect the Stock Split. The parties further acknowledge and agree that the preceding numbers of shares of LICENSEE common stock shall remain subject to adjustment for any stock split, reverse stock split or other similar event that occurs after the Amendment Date and affects the LICENSEE common stock.

10. Amendment to Paragraph 3.3(a). Paragraphs 3.3(a)(3) through 3.3(a)(6) of the Agreement are hereby amended and restated to read in their entirety as follows:

"(3) on or before February 10, 2008, file with the US FDA an IND (or its equivalent in a foreign country) for a Licensed Product;

(4) on or before February 10, 2009, commence in the U.S. a Phase 1/2 clinical trial (or its equivalent in a foreign country) for a Licensed Product;

(5) on or before February 10, 2012, commence a Phase 3 clinical trial (or its equivalent in a foreign country) for a Licensed Product;

(6) on or before February 10, 2015, file with the US FDA an NDA or PLA (or its equivalent in a foreign country) for a Licensed Product;"

11. Amendment to Paragraph 3.3(b). Paragraph 3.3(b) of the Agreement is hereby amended to add the following new sentence at the end of the existing paragraph:

"Notwithstanding the foregoing, from and after initiation of a Phase 3 clinical trial of a Licensed Product, UNIVERSITY's sole remedy for LICENSEE's failure to perform any of its obligations specified in Paragraph 3.3(a) will be to convert LICENSEE's exclusive license under this Agreement to a non-exclusive license."

12. Insurance. Notwithstanding the provisions of Paragraph 8.2(b) of the Agreement, prior to initiation of the first clinical trial of a Licensed Product, LICENSEE's sole obligation with respect to insurance shall be to maintain comprehensive or commercial general liability insurance with a limit of $1,000,000 per occurrence and in the aggregate. From and after initiation of the first clinical trial of a Licensed Product, the insurance obligations set forth in Paragraph 8.2(b) of the Agreement shall apply.

13. Amendment to Paragraph 10.1. Effective as of the Amendment Date, LICENSEE's address for notices under Paragraph 10.1 of the Agreement shall be as follows:

Carl Eibl
Celladon Corporation
c/o Enterprise Partners Venture Capital
2223 Avenida de la Playa, Suite 300

La Jolla, CA 92037
Facsimile: (858) 731-0231

14. Exhibit A. Exhibit A attached to this Amendment and incorporated herein by this reference is hereby made a part of the Agreement (as amended by this Amendment).

15. Entire Agreement. The Agreement, as amended by this Amendment, embodies the entire understanding of the parties and shall supersede all previous communications, representations and understandings, whether oral, written or otherwise, between the parties relating to the subject matter hereof. Except as specifically amended by this Amendment, the terms and conditions of the Agreement shall remain in full force and effect.

16. Governing Law. This Amendment shall be interpreted and construed in accordance with the laws of the state of California, but the scope and validity of any patent or patent application shall be governed by the applicable laws of the country of the patent or patent application.

17. Counterparts. This Amendment may be executed in counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument.

IN WITNESS WHEREOF, both UNIVERSITY and LICENSEE have executed this Amendment, in duplicate originals, by their respective and duly authorized officers as of the Amendment Date.

CELLADON CORPORATION

By /s/ Carl Eibl
Carl Eibl
Secretary and Treasurer

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA:

By /s/ Alan S. Paau
Alan S. Paau
Assistant Vice Chancellor,
Technology Transfer &
Intellectual Property Services

Exhibit A

Patent Rights

[...***...]

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Exhibit 10.16

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

EXCLUSIVE LICENSE AGREEMENT

THIS EXCLUSIVE LICENSE AGREEMENT (the "***Agreement***") is entered into as of June 7, 2006 (the "***Effective Date***") by and between **MARTIN J. KAPLITT, M.D.**, an individual having an address of [...***...] ("***Licensor***"), and **CELLADON CORPORATION**, a California corporation, with offices at 2223 Avenida de la Playa, Suite 206, La Jolla, CA 92037 ("***Celladon***").

WHEREAS, Celladon desires to obtain from Licensor, and Licensor desires to grant to Celladon, an exclusive, worldwide license under the Licensed Patents (defined below), as more fully described herein.

NOW THEREFORE, in consideration of the foregoing and the covenants and premises contained in this Agreement, the parties agree as follows:

1. DEFINITIONS. For purposes of this Agreement, the following capitalized terms shall have the meanings indicated:

1.1 "Affiliate" shall mean any entity controlled by, controlling, or under common control with a party hereto and shall include any entity more than 50% of whose voting stock or participating profit interest is owned or controlled, directly or indirectly, by a party, and any company which owns or controls, directly or indirectly, more than 50% of the voting stock of a party.

1.2 "Field" shall mean the treatment or prevention of heart failure using products that act by the delivery of genes encoding proteins whose role is to regulate calcium uptake or release in the sarcoplasmic reticulum.

1.3 "Joint Owner(s)" shall have the meaning provided in Article 2 hereof.

1.4 "Licensed Patents" shall mean (a) US Patent No. US [...***...], US Patent Application No. [...***...] and PCT/US Patent Application No. [...***...], (b) any and all corresponding foreign patents and patent applications, whether now existing or hereafter filed, (c) any provisionals, substitutions, divisionals, reissues, renewals, continuations, continuations-in-part, substitute applications and inventors' certificates arising from, or based upon, any of the foregoing patents or patent applications, and (d) any patents issuing from any of the foregoing patent applications.

1.5 "Net Sales" shall mean the gross amount received by Celladon, its Affiliates and sublicensees from Third Parties that are not Affiliates or sublicensees of the selling party from sales of Products, less the following items, as allocable to such Product (if not previously deducted from the amount invoiced): (i) trade discounts, credits or allowances, (ii) credits or allowances additionally granted upon returns, rejections or recalls, (iii) freight, shipping and

insurance charges, (iv) taxes, duties or other governmental tariffs (other than income taxes) and (v) government mandated rebates.

1.6 "Product" shall mean any product the manufacture, use, sale, offer for sale or import of which is covered by a Valid Claim.

1.7 "Third Party" shall mean any entity other than Licensor or Celladon or an Affiliate of Licensor or Celladon.

1.8 "Valid Claim" shall mean a claim of an issued patent included within the Licensed Patents, which claim has not lapsed, been canceled or become abandoned and has not been declared invalid or unenforceable by an unreversed and unappealable decision or judgment of a court or other appropriate body of competent jurisdiction, and which has not been admitted to be invalid or unenforceable through reissue, disclaimer or otherwise.

2. LICENSE GRANT

Subject to the terms and conditions of this Agreement, Licensor hereby grants to Celladon during the term of this Agreement an exclusive (even as to Licensor), worldwide, royalty-bearing license, with the right to sublicense through multiple tiers of sublicense, under Licensor's interest in the Licensed Patents for any purpose in the Field, including, without limitation, to develop, make, have made, use, sell, offer for sale, have sold and import Products in the Field. Notwithstanding the exclusivity of the foregoing license, in the event that Celladon has not executed exclusive license agreements with respect to the Licensed Patents with each other joint owner of the Licensed Patents (*i.e.*, Edward Diethrich and The Rockefeller University on behalf of Michael Kaplitt; each, a "***Joint Owner***" and collectively, the "***Joint Owners***") by the fourth anniversary of the Effective Date, then the foregoing license shall automatically become non-exclusive as of such fourth anniversary.

3. PAYMENTS

3.1 Upfront Fee. Within 30 days after the Effective Date, Celladon shall pay to Licensor $25,000.

3.2 Annual Maintenance Fee. Beginning on the first anniversary of the Effective Date and on each subsequent anniversary of the Effective Date thereafter during the term of this Agreement, Celladon shall pay to Licensor an annual license maintenance fee of $6,000.

3.3 Milestone Payments. Within 30 days after the first occurrence of each of the events set forth below, Celladon shall pay to Licensor the following one-time, non-refundable, non-creditable milestone payments: (a) $[...***...] upon filing with the FDA of an Investigational New Drug application for a Product; and (b) $[...***...] upon FDA approval of Biologics Licensing Application for a Product.

3.4 Royalty. Celladon shall pay to Licensor a royalty of [...***...]% of Net Sales of Products. The foregoing royalty shall be payable on a Product-by-Product and country-by-country basis until expiration of the last to expire of the Licensed Patents containing a Valid Claim claiming the manufacture, use or sale of such Product in such country.

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3.5 Non-Royalty Sublicense Income. In the event that Celladon executes exclusive license agreements with respect to the Licensed Patents with both of the Joint Owners and is obligated to pay to either or both of such Joint Owners a percentage of non-royalty sublicense income received by Celladon with respect to the Licensed Patents, then Celladon shall promptly notify Licensor thereof and agrees to pay to Licensor thereafter a percentage of such non-royalty sublicense income equal to the average of the percentages paid to the Joint Owners. The table below sets forth, for purposes of illustration only, the applicable percentage of non-royalty sublicense income that would be payable to Licensor under two theoretical scenarios (in each case, assuming Celladon has entered into exclusive license agreements with respect to the Licensed Patents with both of the Joint Owners):

	Percentage Payable to Joint Owner 1	Percentage Payable to Joint Owner 2	Percentage Payable to Licensor
Example 1	[...***...]%	[...***...]%	[...***...]%
Example 2	[...***...]%	[...***...]%	[...***...]%

3.6 Calculation and Payment of Royalties. Payments pursuant to Section 3.4 and, if applicable, Section 3.5 and reports for the sale of Products and, if applicable, the receipt of non-royalty sublicense income shall be calculated and reported for each calendar quarter. All payments due to Licensor pursuant to Sections 3.4 and 3.5 shall be paid within 60 days of the end of each calendar quarter, unless otherwise specifically provided herein. Each such payment shall be accompanied by a report of Net Sales of Products and, if applicable, non-royalty sublicense income in sufficient detail to permit confirmation of the accuracy of the payment made. Licensor will pay any and all taxes levied on account of any payments made to Licensor under this Agreement. If any taxes are required to be withheld by Celladon, Celladon will (a) deduct such taxes from the payment made to Licensor, (b) timely pay the taxes to the proper taxing authority, and (c) promptly send proof of payment to Licensor and certify its receipt by the taxing authority. All payments hereunder shall be payable in U.S. dollars. When conversion of payments from any foreign currency is required, such conversion shall be at the exchange rate used by Celladon throughout its accounting system during the applicable period for which a payment is due. All payments owed under this Agreement shall be made by wire transfer to a bank and account designated in writing by Licensor, unless otherwise specified in writing by Licensor.

3.7 Records; Audits. Celladon shall keep (and shall cause its Affiliates and sublicensees to keep) complete and accurate records pertaining to the sale or other disposition of Products in sufficient detail to permit Licensor to confirm the accuracy of payments due hereunder. Licensor shall have the right to cause an independent, certified public accountant reasonably acceptable to Celladon to audit such records to confirm Net Sales, royalties and, if applicable, non-royalty sublicense income for a period covering not more than the preceding three (3) years. Such audits may be exercised during normal business hours upon reasonable prior written notice to Celladon, and Licensor shall not have the right to conduct more than one such audit per year or to audit the same year more than once. Licensor shall bear the full cost of such audit unless such audit discloses an underpayment by Celladon of more than 10% of the amount of payments due under this Agreement, in which case, Celladon shall bear the full cost of such audit and shall promptly remit to Licensor the amount of any underpayment.

3.8 Confidentiality of Reports and Records. During the term of this Agreement and for five years thereafter, Licensor shall treat as confidential and shall not disclose to any Third Party the terms of this Agreement and any information contained in the reports provided by Celladon to Licensor pursuant to Section 3.6 and/or in records of Celladon to which Licensor or its auditor receives access pursuant to Section 3.7.

4. REPRESENTATIONS AND WARRANTIES; ACKNOWLEDGMENT

4.1 Licensor Representations and Warranties. Licensor represents and warrants to Celladon that, at the time the invention was conceived and reduced to practice, Licensor was not an employee of The Rockefeller University ("***Rockefeller***") or any other entity, nor was Licensor obligated to assign his rights in such invention to Rockefeller or any other entity. Licensor further represents and warrants to Celladon that, to the best of Licensor's knowledge: (a) other than Licensor, the two other inventors named in the Licensed Patents and Rockefeller, no Third Party has any ownership interest in the Licensed Patents; and (b) Licensor has the right to grant the license he purports to grant herein, and he has not previously granted to any Third Party any right or license to practice the inventions claimed in the Licensed Patents within the Field.

4.2 Licensor Acknowledgment. Licensor acknowledges that Rockefeller has the sole right to file, prosecute, maintain and enforce the Licensed Patents on Licensor's behalf.

5. TERM; TERMINATION

5.1 Term. The term of this Agreement will commence as of the Effective Date of this Agreement and, unless sooner terminated as provided hereunder, will terminate upon the expiration of the last to expire of the Licensed Patents containing a Valid Claim.

5.2 Termination. Celladon shall have the right to terminate this Agreement for any reason or for no reason upon 60 days' written notice to Licensor. Licensor shall have the right to terminate this Agreement upon 60 days' written notice to Celladon upon or after the breach of any material provision of this Agreement by Celladon if Celladon has not cured such breach within the 60-day period following written notice of termination by Licensor.

5.3 Effect of Termination; Surviving Obligations. Upon termination of this Agreement: (a) the license granted by Licensor to Celladon in Article 2 shall terminate and be of no further force and effect; and (b) all other rights and obligations of the parties under this Agreement shall terminate, except as set forth in this Section 5.3. Expiration or termination of this Agreement shall not relieve either party of any obligation accruing prior to such expiration or termination. Except as expressly set forth elsewhere in this Agreement, the obligations and the rights of the parties under Sections 3.6, 3.7, 3.8 and 5.3 and Articles 6 and 7 shall survive expiration or termination of this Agreement.

5.4 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by Licensor are, and will otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of right to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code.

6. INDEMNIFICATION

6.1 Indemnification. Celladon hereby agrees to save, defend, indemnify and hold harmless Licensor from and against any and all losses, damages, liabilities, expenses and costs, including reasonable legal expenses and attorneys' fees ("***Losses***"), to which Licensor may become subject as a result of any claim, demand, action or other proceeding by any Third Party (each, a "***Claim***") to the extent such Losses arise directly or indirectly out of (a) the practice by Celladon of the license granted under Article 2, or (b) the development, manufacture, handling, storage, sale or other disposition of any Product by Celladon, its Affiliates and sublicensees. Licensor shall give notice to Celladon of any Claim for which Licensor may be entitled to indemnification hereunder promptly after learning of such Claim, and Celladon shall have the right to assume the defense of such Claim. If such defense is assumed by Celladon, Celladon will not be liable for any Losses in connection with any settlement of such Claim made by Licensor without Celladon's consent and will not be obligated to pay the fees and expenses of any separate counsel retained by Licensor with respect to such Losses.

6.2 Limitation of Liability. NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT OR ANY LICENSE GRANTED HEREUNDER.

6.3 Insurance. Commencing prior to initiation of the first clinical trial of a Product and thereafter during the term of this Agreement, Celladon shall maintain product liability insurance coverage with a limit of not less than $5,000,000 in the aggregate and shall cause Licensor to be named as an additional insured under such policy.

7. MISCELLANEOUS PROVISIONS

7.1 Governing Law. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding its conflicts of laws principles.

7.2 Entire Agreement; Modification. This Agreement is both a final expression of the parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein. This Agreement may only be modified or amended in a writing expressly stated for such purpose and signed by the parties to this Agreement.

7.3 Relationship Between the Parties. The parties' relationship, as established by this Agreement, is solely that of independent contractors.

7.4 Non-Waiver. The failure of a party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such party.

7.5 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either party

without the prior written consent of the other party (which consent shall not be unreasonably withheld); *provided*, *however*, that either party may assign this Agreement and its rights and obligations hereunder without the other party's consent in connection with the transfer or sale of all or substantially all of the business of such party to which this Agreement relates to a Third Party, whether by merger, sale of stock, sale of assets or otherwise. The rights and obligations of the parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties. Any assignment not in accordance with this Agreement shall be void.

7.6 No Third Party Beneficiaries. This Agreement is neither expressly nor impliedly made for the benefit of any party other than those executing it.

7.7 Severability. If, for any reason, any part of this Agreement is adjudicated invalid, unenforceable or illegal by a court of competent jurisdiction, such adjudication shall not affect or impair, in whole or in part, the validity, enforceability or legality of any remaining portions of this Agreement. All remaining portions shall remain in full force and effect as if the original Agreement had been executed without the invalidated, unenforceable or illegal part.

7.8 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, or by overnight courier or facsimile confirmed thereafter by any of the foregoing, to the party to be notified at its address given on the first page of this Agreement, or at any address such party has previously designated by prior written notice to the other. Notice shall be deemed sufficiently given for all purposes upon the earlier of: (a) the date of actual receipt; (b) if mailed, three calendar days after the date of postmark; or (c) if delivered by overnight courier, the next business day the overnight courier regularly makes deliveries.

7.9 Headings. The headings contained in this Agreement have been added for convenience only and shall not be construed as limiting or used in the interpretation of this Agreement.

7.10 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement, including the Exhibit attached hereto and incorporated herein by reference.

MARTIN J. KAPLITT, M.D.

/s/ Martin J. Kaplitt

CELLADON CORPORATION

By: /s/ Steven K. Brauer
Name: Steven K. Brauer
Title: Chief Business Officer

Exhibit 10.17

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

NON-EXCLUSIVE LICENSE AGREEMENT

THIS NON-EXCLUSIVE LICENSE AGREEMENT (the ***"Agreement"***) is entered into as of January 15, 2008 (the ***"Effective Date"***), by and between **CELLADON CORPORATION**, a California corporation (***"Celladon"***), having offices at 2223 Avenida de la Playa, Suite 120, La Jolla, California 92037, and **ASKBIO, LLC**, a limited liability company (***"AskBio"***) and wholly-owned subsidiary of Asklepios Biopharmaceutical, Inc. (***"Asklepios"***), having offices at 870 Martin Luther King, Jr. Blvd., Chapel Hill, NC 27514.

WHEREAS, AskBio is the exclusive licensee of the Patent Rights (as defined below);

WHEREAS, Celladon wishes to obtain, and AskBio is willing to grant, a non-exclusive, worldwide license under the Patent Rights to develop and commercialize Products in the Field of Use (each as defined below), on the terms and subject to the conditions set forth herein; and

WHEREAS, AskBio wishes to obtain, and Celladon is willing to grant, an option to obtain a non-exclusive, worldwide license under the Cross-License Patent Rights to develop and commercialize Cross-License Products in the Cross-License Field (each as defined below), on the terms and subject to the conditions set forth herein.

Now, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, the parties hereto hereby agree as follows:

1. DEFINITIONS

1.1 "Affiliate" shall mean any company or entity controlled by, controlling, or under common control with a party hereto and shall include any company more than 50% of whose voting stock or participating profit interest is owned or controlled, directly or indirectly, by a party, and any company which owns or controls, directly or indirectly, more than 50% of the voting stock of a party, and for purposes of AskBio, shall also include NanoCor Therapeutics, Inc.

1.2 "Confidential Information" shall have the meaning provided in Section 5.1.

1.3 "Cross-License Field" shall mean the treatment of cardiac diseases, including, without limitation, the delivery of I-1c and hsp20 to treat heart failure.

1.4 "Cross-License Patent Rights" shall mean:

(a) the patents and patent applications listed on ***Exhibit B*** attached hereto;

(b) any and all divisionals, continuations and continuations-in-part of the patents and patent applications referenced in the preceding subsection (a);

(c) the foreign patent applications associated with the patent applications referenced in the preceding subsections (a) and (b);

(d) the patents issued or issuing from the patent applications referenced in the preceding subsections (a) through (c); and

(e) reissues, reexaminations, restorations (including supplemental protection certificates) and extensions of any patent or patent application referenced in the preceding subsections (a) through (d).

1.5 "Cross-License Product" shall mean a product: (a) the development, manufacture, use, import, export or sale of which would, in the absence of a license thereunder, infringe a Valid Claim of the Cross-License Patent Rights; and (b) which uses or incorporates the invention(s) claimed in the patent applications listed in ***Exhibit C*** hereto.

1.6 "Field of Use" shall mean the production and delivery of adeno-associate viral vector (AAV) Serotype 1 to deliver SERCA 2a for the treatment of heart failure and arrhythmias.

1.7 "First Commercial Sale" of a Product means the first sale for use or consumption of such Product in a country after required marketing and pricing approval has been granted by the governing health regulatory authority of such country. Sale to an Affiliate or sublicensee shall not constitute a First Commercial Sale unless the Affiliate or sublicensee is the end user of the Product.

1.8 "Net Sales" shall mean the gross amounts invoiced by Celladon, its Affiliates and its sublicensees for sales of Products to Third Parties that are not Affiliates or sublicensees of the selling party (unless such Affiliate or sublicensee is the end user of such Product, in which case the amount billed therefor shall be deemed to be the amount that would be billed to a Third Party end user in an arm's-length transaction), less the following items, as allocable to such Product (if not previously deducted from the amount invoiced:

(a) discounts, including cash discounts, discounts to managed care or similar organizations or government organizations, administrative fees paid to pharmacy benefits managers; rebates paid or credited, including government rebates such as Medicaid chargebacks or rebates; retroactive price reductions or allowances actually allowed or granted from the billed amount; and commercially reasonable promotional allowances actually granted to customers as reflected on the same invoice for the sale of Product;

(b) credits or allowances actually granted upon claims, rejections or returns of such sales of Product, including recalls;

(c) taxes, duties or other governmental charges levied on or measured by the billing amount when included in billing, as adjusted for rebates, charge-backs and refunds;

(d) freight, postage, shipping and insurance charges to the extent included on the same invoice by Celladon or its sublicensee for delivery of Product; and

(e) actual uncollectible accounts receivable determined in accordance with US generally accepted accounting practices, consistently applied;

provided, however, that the deductions described in the preceding subsections (a), (b), (d), and (e) shall not exceed 15% of the gross amounts invoiced.

1.9 "Option" shall have the meaning provided in Section 2.3.

1.10 "Option Period" shall mean the period beginning on the Effective Date and expiring on the earlier of (a) the date that is 60 days after Celladon notifies AskBio in writing that a United States patent within the Cross-License Patent Rights has been issued by the United States Patent and Trademark Office and (b) the seventh (7th) anniversary of the Effective Date.

1.11 "Patent Rights" shall mean:

(a) the patents and patent applications listed on Exhibit A attached hereto;

(b) any and all divisionals, continuations and continuations-in-part of the patents and patent applications referenced in the preceding subsection (a);

(c) the foreign patent applications associated with the patent applications referenced in the preceding subsections (a) and (b);

(d) the patents issued or issuing from the patent applications referenced in the preceding subsections (a) through (c); and

(e) reissues, reexaminations, restorations (including supplemental protection certificates) and extensions of any patent or patent application referenced in the preceding subsections (a) through (d).

1.12 "Product" shall mean a product the development, manufacture, use, import, export or sale of which would, in the absence of a license thereunder, infringe a Valid Claim of the Patent Rights.

1.13 "Third Party" shall mean any entity other than Celladon or AskBio or an Affiliate of Celladon or AskBio.

1.14 "Valid Claim" shall mean a claim of an issued and unexpired patent included within the Patent Rights or the Cross-License Patent Rights (as applicable), which claim has not been revoked or held unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction (which decision is not appealable or has not been appealed within the time allowed for appeal) and which claim has not been disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or otherwise.

2. GRANT OF LICENSE; CROSS-LICENSE OPTION

2.1 License Grant. Subject to the terms and conditions of this Agreement, AskBio hereby grants to Celladon a non-exclusive, royalty-bearing, worldwide license, including the right to grant sublicenses through multiple tiers of sublicense, under the Patent Rights solely to develop, make, have made, use, offer for sale, sell, have sold, import, have imported, export and have exported Products in the Field of Use.

2.2 Sublicensing. Celladon may grant sublicenses under this Agreement only pursuant to a written sublicense agreement containing terms and conditions consistent with the terms and conditions of this Agreement. Any such sublicense agreement shall provide for

termination of the sublicense upon termination of this Agreement. In the event that Celladon grants a sublicense under this Agreement, Celladon shall notify AskBio in writing so that AskBio may notify UNC.

2.3 Cross-License Option. Subject to the terms and conditions of this Agreement, Celladon hereby grants to AskBio an option (the ***"Option"***) to obtain a non-exclusive, royalty-bearing, worldwide license, including the right to grant sublicenses through multiple tiers of sublicense, under the Cross-License Patent Rights solely to develop, make, have made, use, offer for sale, sell, have sold, import, have imported, export and have exported Cross-License Products in the Cross-License Field. AskBio may exercise the Option at any time prior to expiration of the Option Period by written notice to Celladon. If AskBio timely exercises the Option, the parties shall, within 30 days after such exercise, execute a written license agreement with respect to such license, which agreement shall obligate AskBio to make license fee and milestone payments in amounts equal to 50% of the license fee and annual maintenance fees set forth in Sections 3.1 and 3.2 and to pay royalties at a royalty rate that is 50% of the royalty rate set forth in Section 3.3 and shall otherwise be subject to the same terms and conditions as are applicable to the license granted to Celladon under this Agreement, *mutatis mutandis*.

2.4 No Implied Licenses. No license, option or other right under any intellectual property rights of either party is granted or shall be granted by implication. All such licenses, options or other rights are or shall be granted only as expressly provided in the terms of this Agreement.

3. PAYMENT OBLIGATIONS

3.1 License Fee. Celladon shall pay to AskBio a non-refundable license fee of US$150,000 (the ***"License Fee"***), payable as follows:

(a) US$75,000 within 10 days after the Effective Date;

(b) US$50,000 on the date that is five (5) months after the Effective Date; and

(c) US$25,000 on the date that is 10 months after the Effective Date.

The full amount of the License Fee shall be payable regardless of whether this Agreement is terminated before the due date of any of the foregoing installments of the License Fee. If this Agreement is terminated before payment in full of the License Fee, the unpaid portion of the License Fee at the time of such termination shall become immediately due and payable upon such termination.

3.2 Maintenance Fees. Celladon shall pay to AskBio an annual maintenance fee of US$100,000 on each anniversary of the Effective Date during the term of this Agreement.

3.3 Royalties. Celladon shall pay to AskBio a running royalty of [...***...] percent ([...***...]%) of Net Sales of Products. Royalties under this Section 3.3 shall be paid, on a country-by-country and Product-by-Product basis, from First Commercial Sale of any Product in

any country until expiration of the last-to-expire Valid Claim of the Patent Rights claiming the development, manufacture, use, import, export or sale of such Product in such country.

3.4 Reimbursement of Payments. Celladon shall reimburse AskBio the following milestones which are payable to UNC under the UNC License Agreement (as defined below) for each Licensed Product (which is defined under the UNC License Agreement as each product or component part thereof whose manufacture or sale includes the Patent Rights and any method, process or procedure whose practice includes any use of the Patent Rights):

Approval of IND	$[...***...]
Completion of Phase II clinical trial	$[...***...]
Approval of NDA (or equivalent)	$[...***...]
First Commercial Sale	$[...***...]

4. PAYMENTS; RECORDS; AUDITS

4.1 Payment; Reports. Royalty payments and reports for the sale of Products shall be calculated and reported for each calendar quarter. All royalty payments due to AskBio under this Agreement shall be paid within 60 days of the end of each calendar quarter. Each payment of royalties shall be accompanied by a report of Net Sales of Products in sufficient detail to permit confirmation of the accuracy of the royalty payment made, including, without limitation, the number of Products sold, the gross sales and Net Sales of Products, the royalties payable and the method used to calculate the royalty.

4.2 Exchange Rate; Manner and Place of Payment. All payments hereunder shall be payable in U.S. dollars. With respect to each quarter, for countries other than the United States, whenever conversion of royalty payments from any foreign currency shall be required, such conversion shall be made at the rate of exchange reported in *The Wall Street Journal* on the last business day of such quarter. All payments owed under this Agreement shall be made by wire transfer to a bank and account designated in writing by AskBio, unless otherwise specified in writing by AskBio.

4.3 Taxes. AskBio will pay any and all taxes levied on account of any payments made to it under this Agreement. If any taxes are required to be withheld by Celladon, Celladon will (a) deduct such taxes from the payment made to AskBio, (b) timely pay the taxes to the proper taxing authority, and (c) send proof of payment to AskBio and certify its receipt by the taxing authority within 30 days following such payment.

4.4 Records and Audits. Celladon shall keep for a period covering at least the preceding three (3) years complete and accurate records pertaining to the sale or other disposition of Products in sufficient detail to permit AskBio to confirm the accuracy of the royalty payments made hereunder. AskBio shall have the right to cause an independent, certified public accountant reasonably acceptable to Celladon to audit such records for a period covering not more than the preceding three (3) years for the purpose of verifying any amounts payable under

this Agreement. Such audits may be exercised during normal business hours upon reasonable prior written notice to Celladon. Prompt adjustments shall be made by the parties to reflect the results of such audit. AskBio shall bear the full cost of such audit, unless such audit discloses a variance of more than 5% from the amounts actually due, in which case Celladon shall bear the full cost of such audit.

5. CONFIDENTIALITY

5.1 Confidentiality. Except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the parties, the parties agree that, during the term of this Agreement and for five (5) years thereafter, each party shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as expressly provided for in this Agreement any information furnished to it by the other party pursuant to this Agreement (collectively, ***"Confidential Information"***). Each party may use Confidential Information of the other party only to the extent required to accomplish the purposes of this Agreement. Each party will use at least the same standard of care as it uses to protect proprietary or confidential information of its own to ensure that its employees, agents, consultants and other representatives do not disclose or make any unauthorized use of the other party's Confidential Information. Each party will promptly notify the other upon discovery of any unauthorized use or disclosure of the other party's Confidential Information.

5.2 Exceptions. Confidential Information of a party (the ***"disclosing party"***) shall not include any information which the other party (the ***"receiving party"***) can prove by competent evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the receiving party in breach of this Agreement, generally known or available; (b) is known by the receiving party at the time of receiving such information, as evidenced by its previously-existing written records; (c) is hereafter furnished to the receiving party by a Third Party, as a matter of right and without restriction on disclosure; or (d) is independently discovered or developed by the receiving party without the use of Confidential Information belonging to the disclosing party.

5.3 Authorized Disclosure. The receiving party may disclose Confidential Information to the extent such disclosure is reasonably necessary in filing or prosecuting patent applications, prosecuting or defending litigation or complying with applicable governmental regulations, provided that if the receiving party is required to make any such disclosure of the Confidential Information, it will to the extent practicable give reasonable advance notice to the disclosing party of such disclosure requirement and, except to the extent inappropriate in the case of patent applications, will cooperate with the disclosing party's efforts to secure confidential treatment of such information required to be disclosed at the request and expense of the disclosing party.

6. PATENT PROSECUTION

AskBio shall be solely responsible for filing, prosecution, maintenance and enforcement of the Patent Rights, at AskBio's expense. Celladon shall be solely responsible for filing, prosecution, maintenance and enforcement of the Cross-License Patent Rights, at Celladon's expense.

7. REPRESENTATIONS AND WARRANTIES

7.1 AskBio Representations and Warranties. AskBio hereby represents and warrants to Celladon that:

(a) AskBio has the full legal power, authority and right to grant the license under the Patent Rights that it purports to grant hereunder and to perform its obligations under this Agreement;

(b) upon execution and delivery by both parties, this Agreement will constitute a valid and binding agreement of AskBio, enforceable against AskBio in accordance with its terms;

(c) neither AskBio nor any of its Affiliates is a party to any legal action, suit or proceeding relating to the Patent Rights;

(d) the execution, delivery and performance of this Agreement do not conflict with any agreement, instrument or understanding, oral or written, to which AskBio or any of its Affiliates is a party or by which AskBio or any of its Affiliates may be bound. During the term of this Agreement, neither AskBio nor any of its Affiliates shall enter into any agreement, or take or fail to take any action, that would restrict AskBio's legal right to grant to Celladon the rights and benefits contemplated under this Agreement;

(e) pursuant to that certain license agreement between Asklepios and The University of North Carolina at Chapel Hill (***"UNC-CH"***) dated as of April 22, 2003, as amended from time to time (the ***"UNC License Agreement"***), Asklepios is the exclusive licensee of all right, title and interest in and to the Patent Rights. Asklepios, in turn, granted an exclusive license of all right, title and interest in and to the Patent Rights for use in cardiac applications to AskBio. AskBio shall promptly notify Celladon in writing of the termination of the UNC License Agreement; and

(f) pursuant to the UNC License Agreement, upon the termination of the UNC License Agreement for any reason, this Agreement shall be assumed by UNC-CH, provided that where UNC-CH would be required, as a licensor, to assume duties that are impractical or inconsistent with its research, educational and public service mission or that are impermissible for an agency of the State of North Carolina, UNC-CH will not be required to assume such duties or obligations, and UNC-CH and Celladon will negotiate in good faith to amend such terms accordingly.

7.2 Celladon Representations and Warranties. Celladon hereby represents and warrants to AskBio that:

(a) Celladon has the full legal power, authority and right to grant the Option under the Cross-License Patent Rights that it purports to grant hereunder and, upon exercise of such Option, to grant the license described in Section 2.3, and to perform its obligations under this Agreement;

(b) upon execution and delivery by both parties, this Agreement will constitute a valid and binding agreement of Celladon, enforceable against Celladon in accordance with its terms;

(c) neither Celladon nor any of its Affiliates is a party to any legal action, suit or proceeding relating to the Cross-License Patent Rights; and

(d) the execution, delivery and performance of this Agreement do not conflict with any agreement, instrument or understanding, oral or written, to which Celladon or any of its Affiliates is a party or by which Celladon or any of its Affiliates may be bound. During the term of this Agreement, neither Celladon nor any of its Affiliates shall enter into any agreement, or take or fail to take any action, that would restrict Celladon's legal right to grant to AskBio the rights and benefits contemplated under this Agreement.

7.3 Disclaimer. THE INTELLECTUAL PROPERTY RIGHTS PROVIDED BY EACH PARTY HEREUNDER ARE PROVIDED "AS IS" AND, EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, EACH PARTY EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF THE INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES.

7.4 Limitation of Liability. EXCEPT FOR AMOUNTS PAYABLE UNDER ARTICLE 3 AND LIABILITY FOR BREACH OF ARTICLE 5, NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT, EACH PARTY'S PERFORMANCE OR LACK OF PERFORMANCE HEREUNDER OR ANY LICENSE GRANTED HEREUNDER; *provided, however,* that this Section 7.4 shall not be construed to limit either party's indemnification obligations under Article 9.

8. TERM; TERMINATION

8.1 Term. The term of this Agreement shall commence as of the Effective Date and shall continue until expiration of all royalty payment obligations under Section 3.3. Following the expiration of this Agreement, Celladon shall have a license on the same terms as set forth in Section 2.1, except that the license shall be fully-paid, royalty-free, irrevocable and perpetual.

8.2 Termination for Breach. A party may terminate this Agreement prior to its expiration upon or after the breach of any material provision of this Agreement by the other party if the breaching party has not cured such breach within 30 days after written notice thereof by the non-breaching party.

8.3 Termination by Celladon. Celladon may terminate this Agreement prior to its expiration at any time, for any reason or for no reason, upon 180 days' written notice to AskBio.

8.4 Effect of Termination.

(a) Upon termination of this Agreement (i) the license granted under Section 2.1 shall terminate and be of no further force or effect, and (ii) any sublicense granted hereunder by Celladon shall terminate and be of no further force or effect; *provided*, *however*, that AskBio shall have the right, but not the obligation, to assume any such sublicense agreement.

(b) Within 30 days following the termination of this Agreement, each party shall return to the other party, or destroy, upon the written request of the other party, any and all Confidential Information of the other party in its possession.

(c) Expiration or termination of this Agreement shall not relieve the parties of any obligation accruing prior to such expiration or termination. The provisions of Section 2.3 of this Agreement shall survive termination of this Agreement by AskBio pursuant to Section 8.2 for Celladon's uncured material breach and termination of this Agreement by Celladon pursuant to Section 8.3, but shall not survive termination of this Agreement by Celladon pursuant to Section 8.2 for AskBio's uncured material breach or expiration of this Agreement. The provisions of Sections 4.4, 7.3, 7.4 and 8.4 and Articles 1, 5, 6, 9, 10 and 11 shall survive any termination or expiration of this Agreement.

9. INDEMNIFICATION

9.1 Indemnification by Celladon. Celladon hereby agrees to save, defend, indemnify and hold harmless AskBio, its Affiliates and their respective officers, directors, employees, consultants and agents (the ***"AskBio Indemnitees"***) from and against any and all losses, damages, liabilities, expenses and costs, including reasonable legal expense and attorneys' fees (***"Losses"***), to which AskBio may become subject as a result of any claim, demand, action or other proceeding by any Third Party to the extent such Losses arise directly or indirectly out of (a) the gross negligence or willful misconduct of Celladon, (b) the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement, or (c) the development, manufacture, use, handling, storage, sale or other disposition of any Product by Celladon, its Affiliates or sublicensees; in each case except to the extent such Losses result from the gross negligence or willful misconduct of any AskBio Indemnitee or the breach by AskBio of any warranty, representation, covenant or agreement made by AskBio in this Agreement.

9.2 Control of Defense. In the event AskBio seeks indemnification under Section 9.1, it shall inform Celladon of a claim as soon as reasonably practicable after it receives notice of the claim, shall permit Celladon to assume direction and control of the defense of the claim (including the right to settle the claim solely for monetary consideration), and shall cooperate as requested (at the expense of Celladon) in the defense of the claim.

10. DISPUTE RESOLUTION

10.1 Dispute Resolution. Any dispute arising under or relating to the parties rights and obligations under this Agreement will be referred to the Chief Executive Officers of Celladon and AskBio for resolution. In the event such officers are unable to resolve such dispute

within 30 days or such dispute being referred to them, then, upon the written request of either party to the other party, the dispute shall be subject to arbitration, as provided in Section 10.2.

10.2 Arbitration.

(a) Claims. Subject to Section 10.3 below, any claim, dispute, or controversy of whatever nature arising out of or relating to this Agreement that is not resolved under Section 10.1 within the applicable 30-day time period, including, without limitation, any action or claim based on tort, contract, or statute, or concerning the interpretation, effect, termination, validity, performance and/or breach of this Agreement (***"Claim"***), shall be resolved by final and binding arbitration before a panel of three experts with relevant industry experience (the ***"Arbitrators"***). One Arbitrator shall be chosen by Celladon and one Arbitrator shall be chosen by AskBio within 15 days from the notice of initiation of arbitration. The third Arbitrator shall be chosen by mutual agreement of the Arbitrator chosen by Celladon and the Arbitrator chosen by AskBio within 15 days of the date that the last of such Arbitrators were appointed. The arbitration shall be administered by the American Arbitration Association (the ***"Administrator"***) in accordance with its then existing arbitration rules or procedures regarding commercial or business disputes. The arbitration shall be held in Raleigh, North Carolina.

(b) Arbitrators' Award. The Arbitrators shall, within 15 days after the conclusion of the arbitration hearing, issue a written award and statement of decision describing the essential findings and conclusions on which the award is based, including the calculation of any damages awarded. The decision or award rendered by the Arbitrators shall be final and non-appealable, and judgment may be entered upon it in any court of competent jurisdiction. The Arbitrators shall be authorized to award compensatory damages, but shall NOT be authorized (i) to award non-economic damages, such as for emotional distress, pain and suffering or loss of consortium, (ii) to award punitive damages, or (iii) to reform or modify this Agreement or any other agreements contemplated hereunder; *provided, however,* that the damage limitations described in parts (i) and (ii) of this sentence will not apply if such damages are statutorily imposed.

(c) Costs. Each party shall bear its own attorney's fees, costs, and disbursements arising out of the arbitration, and shall pay an equal share of the fees and costs of the arbitrators; *provided, however,* the Arbitrators shall be authorized to determine whether a party is the prevailing party, and if so, to award to that prevailing party reimbursement for any or all of its reasonable attorneys' fees, costs and disbursements (including, for example, expert witness fees and expenses, photocopy charges, travel expenses, etc.), and/or the fees and costs of the Administrator and the Arbitrators.

(d) Compliance with this Agreement. Unless the parties otherwise agree in writing, during the period of time that any arbitration proceeding is pending under this Agreement, the parties shall continue to comply with all those terms and provisions of this Agreement that are not the subject of the pending arbitration proceeding.

10.3 Court Actions. Nothing contained in this Agreement shall deny any party the right to seek injunctive or other equitable relief from a court of competent jurisdiction in the context of a *bona fide* emergency or prospective irreparable harm, and such an action may be filed and maintained notwithstanding any ongoing arbitration proceeding. In addition, either

party may bring an action in any court of competent jurisdiction to resolve disputes pertaining to the validity, construction, scope, enforceability, infringement or other violations of patents or other proprietary or intellectual property rights, and no such dispute shall be subject to arbitration pursuant to Section 10.2.

10.4 Consequence of Patent Challenge. If Celladon challenges the validity or enforceability of any of the Patent Rights by any opposition, reexamination request, action for declaratory judgment, nullity action, interference or other attack upon the validity, title or enforceability thereof in any proceeding before any governmental agency, court or other similar adjudicative forum (any such proceeding a "***Patent Challenge***"), such Patent Challenge shall be deemed to be a material breach of this Agreement and AskBio may terminate this Agreement as provided in Section 8.2, without limiting any right AskBio may have in law or in equity.

11. GENERAL PROVISIONS

11.1 Governing Law. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of North Carolina, excluding its conflicts of laws principles.

11.2 Entire Agreement; Modification. This Agreement (including the Exhibits hereto) is both a final expression of the parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein. This Agreement may not be modified or supplemented by any purchase order, change order, acknowledgment, order acceptance, standard terms of sale, invoice or the like. This Agreement may only be modified or supplemented in a writing expressly stated for such purpose and signed by the parties to this Agreement.

11.3 Relationship Between the Parties. The parties' relationship, as established by this Agreement, is solely that of independent contractors. This Agreement does not create any partnership, joint venture or similar business relationship between the parties. Neither party is a legal representative of the other party, and neither party can assume or create any obligation, representation, warranty or guarantee, express or implied, on behalf of the other party for any purpose whatsoever.

11.4 Non-Waiver. The failure of a party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such party.

11.5 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either party without the prior written consent of the other party (which consent shall not be unreasonably withheld); *provided*, *however*, that either party may assign this Agreement and its rights and obligations hereunder without the other party's consent in connection with the transfer or sale of all or substantially all of the business of such party to which this Agreement relates to a Third Party, whether by merger, sale of stock, sale of assets or otherwise. The rights and obligations of

the parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties. Any assignment not in accordance with this Agreement shall be void. In the event that this Agreement is assigned to a third party, Celladon shall notify AskBio so that AskBio may notify UNC.

11.6 No Third Party Beneficiaries. This Agreement is neither expressly nor impliedly made for the benefit of any party other than those executing it.

11.7 Severability. If, for any reason, any part of this Agreement is adjudicated invalid, unenforceable or illegal by a court of competent jurisdiction, such adjudication shall not affect or impair, in whole or in part, the validity, enforceability or legality of any remaining portions of this Agreement. All remaining portions shall remain in full force and effect as if the original Agreement had been executed without the invalidated, unenforceable or illegal part.

11.8 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, or by overnight courier or facsimile confirmed thereafter by any of the foregoing, to the party to be notified at its address given below, or at any address such party has previously designated by prior written notice to the other. Notice shall be deemed sufficiently given for all purposes upon the earlier of: (a) the date of actual receipt; (b) if mailed, three business days after the date of postmark; or (c) if delivered by overnight courier, the next business day the overnight courier regularly makes deliveries.

If to Celladon, notices must be addressed to:

Celladon Corporation
2223 Avenida de la Playa
Suite 120
La Jolla, CA 92037
Attention: Chief Executive Officer
Facsimile: (858) 964-0974

If to AskBio, notices must be addressed to:

AskBio, LLC
870 Martin Luther King, Jr. Blvd.
Chapel Hill, NC 27514
Attention: Managing Member
Facsimile: (919) 933-4755

11.9 Force Majeure. Each party shall be excused from liability for the failure or delay in performance of any obligation under this Agreement by reason of any event beyond such party's reasonable control, including but not limited to, Acts of God, fire, flood, explosion, earthquake, or other natural forces, war, civil unrest, accident, destruction or other casualty, any lack or failure of transportation facilities, any lack or failure of supply of raw materials, any strike or labor disturbance, or any other event similar to those enumerated above. Such excuse from liability shall be effective only to the extent and duration of the event(s) causing the failure or delay in performance and provided that the party has not caused such event(s) to occur. Notice of a party's failure or delay in performance due to force majeure must be given to the

other party within 10 days after its occurrence. All delivery dates under this Agreement that have been affected by force majeure shall be tolled for the duration of such force majeure. In no event shall any party be required to prevent or settle any labor disturbance or dispute.

11.10 Interpretation. The headings of clauses contained in this Agreement preceding the text of the articles, sections, subsections and paragraphs hereof are inserted solely for convenience and ease of reference only and shall not constitute any part of this Agreement, or have any effect on its interpretation or construction. All references in this Agreement to the singular shall include the plural where applicable, and all references to gender shall include both genders and the neuter. Unless otherwise specified, references in this Agreement to any article shall include all sections, subsections, and paragraphs in such article; references in this Agreement to any section shall include all subsections and paragraphs in such sections; and references in this Agreement to any subsection shall include all paragraphs in such subsection. All references to days in this Agreement shall mean calendar days, unless otherwise specified. Ambiguities and uncertainties in this Agreement, if any, shall not be interpreted against either party, irrespective of which party may be deemed to have caused the ambiguity or uncertainty to exist. This Agreement has been prepared in the English language and the English language shall control its interpretation. In addition, all notices required or permitted to be given hereunder, and all written, electronic, oral or other communications between the parties regarding this Agreement shall be in the English language.

11.11 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth above.

CELLADON CORPORATION

By: /s/ Krisztina Zsebo
Name: Krisztina Zsebo
Title: CEO

ASKBIO, LLC

By: /s/ Sheila Mikhail
Name: Sheila Mikhail
Title: Managing Member

EXHIBIT A

PATENT RIGHTS

[...***...]

***Confidential Treatment Requested

EXHIBIT B

CROSS-LICENSE PATENT RIGHTS

[...***...]

***Confidential Treatment Requested

EXHIBIT C

CERTAIN ASKBIO PATENT RIGHTS

[...***...]

*****Confidential Treatment Requested**

Exhibit 10.18

LICENSE AGREEMENT

THIS AGREEMENT made this 24th day of February 2009

BETWEEN: AdVec Inc.
259 King Street East
Ancaster, Ontario L9G 2B8
CANADA

hereinafter referred to as "ADVEC"

of the FIRST PART,

AND: CELLADON CORPORATION
2223 Avenida de la Playa, Suite 300
La Jolla, CA 92037

hereinafter referred to as "RECIPIENT"

of the SECOND PART,

WHEREAS, Dr. F.L. Graham, Professor of Biology and Pathology of McMaster University has researched and developed certain Human embryo kidney cells transformed by Adenovirus 5 DNA (hereinafter referred to as "293 cells").

WHEREAS, ADVEC desires to license 293 cells to other parties.

WHEREAS, RECIPIENT desires to acquire a license to use 293 cells for research and/or commercial applications and the AdVec Know-How, as defined herein.

WHEREAS, ADVEC acknowledges that Targeted Genetics Corporation (TGC) had entered into a similar License Agreement with ADVEC effective September 14, 2003 for the license to use 293 cells for research and/or commercial applications and the AdVec Know-How, as defined herein.

AND WHEREAS RECIPIENT desires to obtain from TGC, and ADVEC has agreed to allow, the transfer of TGC's licensed 293 cells and associated Know-How relating to those cells.

NOW, THEREFORE, for and in consideration of these premises, the mutual promises and covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by both parties, ADVEC and RECIPIENT hereby covenant and agree as follows:

1.0 **Covenants made by ADVEC**

1.1 ADVEC will grant to RECIPIENT a non-exclusive, world-wide license: (a) to acquire 293 cells, (b) to use 293 cells if so desired for commercial purposes and (c) to use the AdVec Know-How, as defined herein. 293 cells are considered proprietary to ADVEC, and ADVEC shall be free to use 293 cells for its own research and educational purposes and to license 293 cells to other parties.

1.2 ADVEC has engaged Microbix Biosystems Inc., 341 Bering Ave., Toronto, ON, hereinafter "MICROBIX", to act as its distributor of 293 cells; provided however that ADVEC acknowledges that RECIPIENT may in addition obtain 293 cells from TGC.

1.3 Upon receipt of the financial consideration described in Article 2.1 of this Agreement, ADVEC will provide RECIPIENT as requested with any and all technical information available, directly or indirectly through MICROBIX, at the date of execution of this Agreement and other know-how which directly pertains to 293 cells, including, but not limited to, the characterization, testing and passage history of the 293 cells (the "AdVec Know-How").

1.4 MICROBIX if so requested by RECIPIENT will cooperate in a reasonable manner to expedite the transfer of 293 cells in a viable form as well as any and all AdVec Know-How from ADVEC to RECIPIENT.

1.5 All 293 cells to be purchased directly through MICROBIX will be purchased at their current list prices.

1.6 ADVEC warrants that it is the true owner of 293 cells and the owner of all rights to 293 cells and the AdVec Know-How.

1.7 ADVEC warrants that it has full authority to enter into this Agreement.

1.8 ADVEC agrees that RECIPIENT may create Improvements, as defined below, to the 293 cells. "Improvements" mean any inventions, discoveries, improvements or enhancements relating to the 293 cells, including but not limited to pre-clinical and clinical data, manufacturing processes and methods and information relating to the 293 cells, whether patentable or not, made by RECIPIENT or its affiliates during the term of this Agreement and all intellectual property rights therein and thereto.

1.9 ADVEC agrees that RECIPIENT shall own all legal and equitable title, without limitation, to the Improvements.

2.0 **Covenants made by RECIPIENT**

2.1 RECIPIENT will make annual license maintenance payments to ADVEC in the amount of five thousand dollars in United States currency (US $5,000.00) in consideration for the covenants undertaken by ADVEC. ADVEC shall be in receipt of the first license maintenance payment within sixty (60) days after the execution of this Agreement. Subsequent payments will be payable within sixty (60) days after the anniversary date until the end of the term of this Agreement as provided in Article 6.0 unless otherwise terminated pursuant to the provisions of Article 9.0. Should such consideration not be received by ADVEC from RECIPIENT during the sixty (60) days period, and within fourteen (14) days after ADVEC notifies RECIPIENT of such nonpayment, a breach of covenant will be deemed to have occurred and to be uncorrected and ADVEC shall have the right to terminate this Agreement as provided for in Article 9 of this Agreement.

2.2 RECIPIENT will cooperate in a reasonable manner to expedite the transfer of 293 cells from MICROBIX to RECIPIENT and any or all Advec Know-How to RECIPIENT. RECIPIENT shall not transfer, distribute or release 293 cells to any other parties except that RECIPIENT may transfer 293 cells to its agents, consultants or contractors with a need for such cells to perform RECIPIENT's license rights granted hereunder.

2.3 RECIPIENT agrees to use 293 cells, any derivation thereof or any materials treated therewith only in laboratory animals and/or in vitro unless agreed to in writing by ADVEC.

2.4 RECIPIENT agrees that 293 cells will not be used in human beings. Using the 293 cells, RECIPIENT will be deriving a commercial product to be used in human beings; however, such commercial product will not contain the 293 cells.

2.5 RECIPIENT shall not sub-license this Agreement to any third party without receiving written permission from ADVEC.

2.6 RECIPIENT shall have no rights in 293 cells other than as provided for in this Agreement.

2.7 RECIPIENT will use 293 cells in compliance with all Canadian (if applicable to RECIPIENT), United States and other laws and governmental regulations and guidelines applicable to 293 cells, any derivative thereof and any materials treated therewith.

2.8 RECIPIENT warrants that it has full authority to enter into this Agreement.

3.0 **Relationship of the Parties**

RECIPIENT shall have no authority to bind ADVEC. RECIPIENT is not an agent or employee of ADVEC and shall have no authority to make any third party commitment or representations or enter into any agreement that will subject ADVEC to any obligation whatsoever. RECIPIENT is an independent Corporation whose relationship to ADVEC shall be governed exclusively as stated in this Agreement.

4.0 **Trademarks**

All trademarks, tradenames, logos and customarily used symbols and other designations created thereby, as used or adopted by ADVEC including the designation of 293 cells shall at all times be and remain the property of ADVEC. All trademarks, tradenames, logos and customarily used symbols and other designations used or adopted by RECIPIENT including additional or other designations for 293 cells shall at all times be and remain the property of RECIPIENT. ADVEC shall have no right to use any trademarks, or trade names of RECIPIENT or to refer to this Agreement or the services performed hereunder directly or indirectly, in connection with any product, service, promotion or publication without the prior written approval of RECIPIENT; provided, however, that the foregoing shall not be construed to prohibit RECIPIENT from identifying ADVEC as the source of the 293 cells as necessary or appropriate in regulatory filings with respect to products of RECIPIENT that were discovered or developed using the 293 cells.

5.0 **Public Announcement**

Should one party wish to mention the other party in disclosures or publications, the parties must first agree to such actions.

6.0 **Term**

This Agreement shall commence on the execution date of the Agreement and shall remain in force for a period of ten (10) years, unless otherwise terminated pursuant to the provisions of Article 9.0 relating to termination hereunder (the “Initial Term”. This Agreement shall automatically renew for successive five (5) year periods (the “Renewal Term”), unless either party notifies the other party in writing, at least ninety (90) days before the end of the Initial Term or any Renewal Term, of its election not to renew. RECIPIENT shall have the option to extend the term of this Agreement upon such terms and conditions as both parties may mutually agree.

7.0 **Warranties and Indemnities**

7.1 This Agreement and resulting transfer of 293 cells from MICROBIX or TGC to RECIPIENT constitutes a license held by RECIPIENT to use 293 cells, any derivation thereof, or any material treated therewith solely

for commercial purposes (including research and development of commercial products). 293 cells may not be transferred, assigned or in any way transmitted to another party.

7.2 293 cells are deemed experimental in nature and are provided without warranty of merchantability or fitness for a particular purpose or any other warranty expressed or implied. ADVEC makes no representation or warranty that the use of 293 cells, any derivative thereof or any other material treated therewith will not infringe on any patent or other proprietary right.

7.3 In no event shall ADVEC or MICROBIX be liable for any use by RECIPIENT of 293 cells, any derivative thereof or any material treated therewith for any losses, costs, claims, damage or liability of whatsoever kind or nature which may arise from or in connection with this Agreement.

7.4 ADVEC represents and warrants that it is under no obligation or restriction nor will it assume any obligation or restriction which would in any way interfere or be inconsistent with, or present a conflict of interest, concerning the obligations of ADVEC under this Agreement.

7.5 ADVEC warrants that it will comply and do all things necessary for RECIPIENT to comply with all applicable laws, regulations and ordinances.

7.6 ADVEC shall indemnify RECIPIENT against any actions for damages, losses, costs and claims arising from any breach of ADVEC's obligations or warranties under this Agreement.

7.7 RECIPIENT shall indemnify ADVEC against any actions for damages, losses, costs and claims arising from any breach of RECIPIENT's obligations or warranties under this Agreement.

8.0 **Claims and Demands**

RECIPIENT agrees to defend, indemnify and hold harmless ADVEC from any loss or liability that ADVEC suffers as a consequence of the use by RECIPIENT of 293 cells, any derivative thereof or any material treated therewith, except to the extent such loss or liability is attributable any breach of ADVEC's obligations or warranties under this Agreement.

9.0 **Termination**

This Agreement may be terminated upon the occurrence of one of the following events:

9.1 In breach of covenant contained herein by any party to this Agreement which remains uncorrected after a period of sixty (60) days after notification pursuant to Article 14.0;

9.2 Receipt by a party to this Agreement of written notice that the other party to this Agreement had made an assignment for the benefit of creditors or has been adjudicated bankrupt or insolvent; or institutes any bankruptcy or insolvency proceeding or other proceedings for relief under any bankruptcy law or any law for the relief of debtors; or suffers the appointment of a custodian, receiver or trustee for it or its property and, if appointed without its consent, such appointment remains undischarged for 15 days;

9.3 Mutual agreement of both parties.

Upon termination of this Agreement, RECIPIENT shall return to ADVEC any and all samples of 293 cells.

10.0 **Mechanism for Alterations**

This Agreement can be altered upon written agreement by both parties pursuant to Article 14.0.

11.0 **Surviving Terms**

In the event that any provision of this Agreement shall be invalid, illegal or unenforceable, it shall not affect the validity, legitimacy or enforceability of any other provision of this Agreement.

This Agreement shall inure to the benefit of and be binding upon the heirs, executors, administrators, successors, permitted assigns and any legal representatives of the parties hereto.

12.0 **Force Majeure**

No party to this Agreement shall be liable to the other or deemed to be in default for any delay or failure in performance under this Agreement resulting from Acts of God, civil or military authority, Acts of enemies of the Queen, or fire, explosions, earthquakes, floods, strikes, lockouts or any other event or condition beyond the reasonable control of such party exclusive, however, of the financial condition of such party.

13.0 **Governing Laws**

This Agreement shall be deemed to be made and entered into in the Province of Ontario and shall be governed by and construed under and in accordance with the laws of the Province of Ontario.

14.0 **Notification**

Any notice or alterations contemplated by or made pursuant to this Agreement shall be in writing and shall be delivered electronically, by prepaid courier, by registered prepaid mail or by hand. Such notices shall be deemed to have been received after verification of such receipt or ten (10) days, whichever is lesser. Notices shall be addressed to the attention of the following persons or their designates as given notice in writing in accordance with the provisions of this paragraph.

FOR THE PARTY OF THE FIRST PART

Frank L. Graham
President & Chief Executive Officer
AdVec Inc.
Ancaster, Ontario
CANADA

FOR THE PARTY OF THE SECOND PART

CELLADON CORPORATION
2223 Avenida de la Playa, Suite 300
La Jolla, CA 92037
USA

15.0 **Headings and Definitions**

The paragraph headings and definitions contained in this Agreement are for convenience only.

16.0 **Entire Agreement**

This Agreement hereto constitutes and contains the entire agreement of the parties and supersedes any and all prior negotiations, correspondence, undertakings and agreements between the parties respecting the subject matter hereof. This Agreement hereto may only be amended by a written instruction signed by the parties.

This Agreement is not assignable, whether by operation of law or with the prior written consent of ADVEC, which consent shall not be unreasonably delayed or withheld; provided, however, that RECIPIENT may assign this Agreement and its rights and obligations hereunder without ADVEC's consent in connection with the transfer or sale of all or substantially all of RECIPIENT's business to which this Agreement relates to a third party, whether by merger, sale of stock, sale of assets or otherwise.

IN WITNESS whereof the parties have caused this Agreement to be duly executed as of the day first written above.

Signed on behalf of:

AdVec, Inc.

/s/ Frank L. Graham

Frank L. Graham
President & Chief Executive Officer
AdVec Inc.

Date: February 27, 2009

Communications:
Frank Graham
AdVec Inc.
Piazza delle 5 Scole 23
Rome 00186
Italy

Signed on behalf of:

Celladon Corporation

/s/ Krisztina M. Zsebo

Krisztina M. Zsebo, Ph.D.
CEO & President
Celladon Corporation

Date: 2/28/09

Exhibit 10.19

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

Internal University Use Only
OTC Agreement No.:
OTC Docket No.(s): Z09079
Document Revision Date: 05/11/2009 - Final

UNIVERSITY OF MINNESOTA

EXCLUSIVE PATENT LICENSE AGREEMENT

THIS EXCLUSIVE PATENT LICENSE AGREEMENT (the "Agreement") is made by and between Regents of the University of Minnesota, a constitutional corporation under the laws of the state of Minnesota, having a place of business at 1000 Westgate Drive, Suite 160, St. Paul, Minnesota 55114 (the "University"), and the Licensee identified below.

Purpose

The University and the Licensee are joint owners of the Licensed Technology, as that term is defined and used in this Agreement. The Licensee desires that the University grant it an exclusive license under the University's interest in the Licensed Technology to use, develop, and commercialize the inventions claimed in the Licensed Technology, The University is willing to grant such a license on the terms set forth below.

NOW, THEREFORE, the parties agree that:

The Terms and Conditions of Exclusive Patent License attached hereto as Exhibit A are incorporated herein by reference in their entirety (the "Terms and Conditions"). In the event of a conflict between provisions of this Agreement and the Terms and Conditions, the provisions in this Agreement shall govern. Capitalized terms used in this Agreement without definition shall have the meanings given to them in the Terms and Conditions.

The section numbers used in the parentheses below correspond to the section numbers in the Terms and Conditions.

1. Licensee (1.11). Celladon Corporation, a California corporation, having a place of business at 2223 Avenida de la Playa, Suite 300, La Jolla, CA 92037.

2. Field(s) of Use (1.6). Pharmaceutical screening and testing for human and animal application.

3. Territory (1.17). The territory is any country or territory where an active and enforceable Licensed Patent or a Patent Application exists.

4. Effective Date. The effective date is the date of the last signature of this Agreement.

5. Licensed Technology.

5.1 Licensed Patents(s) (1.9). As of the Effective Date, there are no issued Licensed Patents.

5.2 Patent Application(s) (1.12). The following Patent Application exists as of the Effective Date:

Application No.	Country	Filing Date	Title
[...***...]	United States	[...***...]	[...***...]

6. Patent-Related Expenses (1.13).

The Licensee shall have the first right to prepare, file and prosecute the Patent Applications and maintain the Licensed Patents pursuant to Section 4 of the Terms and Conditions, at the Licensee's sole expense. Accordingly, Licensee shall be responsible for paying directly to the appropriate parties all such Patent Related Expenses Licensee incurs in connection therewith.

7. Sublicense Rights (3.1.2). **Select one of the following:**

☒ Yes

☐ No

8. Federal Government Rights (3.2). **Select one of the following:**

☒ Yes

☐ No

9. Performance Milestones (5.1). Performance Milestones are as follows:

Within 24 months from the Effective Date, Licensee shall have entered into a written agreement with a third party under which the Licensee, using the Licensed Technology, screens or tests or causes to be screened or tested potential biological or pharmaceutical materials as drug candidates for subsequent pre-clinical and clinical development; provided, however, that in the event of a Change of Control of Licensee that occurs within 24 months from the Effective Date, Licensee's successor-in-interest need not enter into any such third party agreements but shall be obligated to use the Licensed Technology to screen or test or cause to be screened or tested potential biological or pharmaceutical materials as drug candidates for subsequent pre-clinical and clinical development within 24 months from the Effective Date.

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Within 60 months from the Effective Date, a third party must have agreed in writing to undertake pre-clinical and clinical development on a drug candidate identified by Licensee or a sublicensee using the Licensed Technology; *provided*, *however*, that in the event of a Change of Control of Licensee that occurs within 60 months from the Effective Date, Licensee's successor-in-interest need not obtain the written agreement of another third party but shall be obligated to undertake pre-clinical and clinical development on a drug candidate identified by Licensee, Licensee's successor or a sublicense using the Licensed Technology within 60 months from the Effective Date.

10. Progress Reports (5.4). Progress Reports are due every six months, with the first report due on six months after the Effective Date and subsequent reports due every six months thereafter.

11. Payments (6.1). All amounts are non-refundable, and payable as defined below or as specified in the University's invoice.

11.1 **Upfront Payment.** Upfront Payment in the amount of **One Hundred Twenty Thousand and 00/100 dollars ($120,000)**, due within 10 days after the Effective Date.

11.2 **Annual License Fee.** The Annual License Fee is due on each anniversary of the Effective Date. The initial amount of the Annual License Fee is **One Hundred Twenty Thousand and 00/100 dollars ($120,000)** ("Initial Amount"). The Initial Amount will increase to Three Hundred Twenty Five Thousand and 00/100 dollars ($325,000) ("Increased Amount") upon the occurrence of the first to occur of any of the events listed below ("Triggering Event"). Licensee shall notify the University immediately upon the first occurrence of a Triggering Event.

Triggering Events

(i) A Change of Control occurs, whether by agreement or operation of law;

(ii) The Agreement, any rights and obligations contained in the Agreement, or the Licensee's joint ownership interest in the Invention(s), Licensed Patents or Patent Applications, are assigned, conveyed, or otherwise transferred (excluding by license), whether by agreement or operation of law, to an Affiliate under Section 14B of the Terms and Conditions, excluding any such assignment, conveyance or transfer to an Affiliate that is a wholly-owned subsidiary of the Licensee or that is under common control (as defined in Section 1.1 of the Terms and Conditions) with the Licensee (in which case, the term "Triggering Event" shall encompass any of the events described clauses (i), (iii), (iv), (v) and (vi) of this section 11.2 that occurs with respect to such Affiliate, *mutatis mutandis*);

(iii) The Agreement, any rights and obligations contained in the Agreement, or the Licensee's joint ownership interest in the Invention(s), Licensed Patents or Patent Applications, are assigned, conveyed, or otherwise transferred (excluding by license), whether by agreement or operation of law, to a third party;

(iv) Licensee has received cumulative License Revenues (defined below) from any and all licenses and sublicenses granted by Licensee (whether exclusive or non-exclusive) and/or Service Revenues (defined below) from any and all Affiliates and third parties, of at least [...***...].

For purposes of this clause (iv), "License Revenues" means all amounts actually received by Licensee from Affiliates and third parties arising from the grant of a license or sublicense under the Licensed Patents and Patent Applications, including upfront fees, technology access fees, {sub)license fees, annual maintenance fees, premiums above the fair market value on sales of debt or equity securities of Licensee, and any other payments in respect of a license or sublicense of the Licensed Patents and Patent Applications; *provided, however*, that License Revenues shall exclude: (a) royalties on sales of Identified Products; (b) payments for debt or equity securities of Licensee (other than premiums above the fair market value of such securities as of the date of such payments); and (c) reimbursements of patent costs actually incurred by Licensee; and "Service Revenues" means all amounts actually received by Licensee from Affiliates and third parties in consideration of the use by Licensee (or a third party contractor on behalf of Licensee) of the Licensed Technology to screen such Affiliates' and third parties' compounds or materials for the purpose of identifying or developing Identified Products;

(v) An investigational new drug application, new drug application, biologic license application or orphan drug application (or any foreign equivalent of such applications) is filed by Licensee, its Affiliate or a third party licensee of Licensee or its Affiliate for an Identified Product (whether such Identified Product is a drug or biologic); or

(vi) Licensee enters into any agreement, partnership, joint venture, or other relationship with a third party to market or use the Licensed Technology (except for use of the Licensed Technology to perform assay services solely on behalf of Licensee under (iv)).

If a Triggering Event occurs on any day other than the anniversary of the Effective Date, Licensee shall pay to University within 30 days of the Triggering Event an additional amount equal to the difference (calculated on a pro rata basis), between the Initial Amount and the Increased Amount for the 12-month period in which the Triggering Event occurred.

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For example, if the Effective Date of this Agreement is April 1, 2009, and no Triggering Event occurs prior to the first anniversary of the Effective Date (April 1, 2010), then the Annual License Fee due on April 1, 2010, would be $120,000. If a Triggering Event occurs three months later on July 1, 2010, then the Annual Maintenance Fee due on the following anniversary of the Effective Date (April 1, 2011) and continuing throughout the Term of the Agreement would be $325,000. Additionally to compensate the University for the nine-month period beginning on the date of the Triggering Event (July 1, 2010) and ending on the following anniversary of the Effective Date (April 1, 2011), Licensee would pay to the University an additional $153,750, which would represent a pro rata adjustment of the Annual License Fee for the nine months remaining before the next anniversary of the Effective Date, calculated as follows:

0.75 x ($325,000 – $120,000), i.e., 0.75 x $205,000, equals $153,750

11.3 Intentionally Deleted.

11.4 Intentionally Deleted.

11.5 **Interest Rate (6.2).** The Interest Rate will be [...***...] percent ([...***...]%) per annum.

11.6 **Other**. None.

12. Licensee's Address for Notice (23). Notices will be sent to the Licensee at:

Celladon Corporation
Attn: Chief Executive Officer
c/o Enterprise Partners Venture Capital
2223 Avenida de la Playa
Suite 300
La Jolla, CA 92037
Facsimile No.: 858-731-0231
Email: [...***...]@celladon.net

13. Licensee expressly warrants and represents and does hereby state and represent that no promise or agreement which is not herein expressed has been made to Licensee in executing this Agreement except those explicitly set forth herein and in the Terms and Conditions, and that Licensee is not relying upon any statement or representation of the University or their representatives.

14. Licensee is relying on Licensee's own judgment and has been represented by legal counsel. Said legal counsel has read and explained to Licensee the entire contents of this Agreement and the Terms and Conditions incorporated by reference herein. Licensee hereby warrants and represents that the Licensee understands and agrees to all the provisions in this Agreement and said Terms and Conditions.

*****Confidential Treatment Requested**

IN WITNESS WHEREOF, the parties hereto have caused their duly authorized representatives to execute this Agreement.

Regents of the University of Minnesota

By: /s/ Jay W. Schrankler
Jay W. Schrankler
Executive Director
Office for Technology Commercialization

Date: 5-11-09

Celladon Corporation

By: /s/ Krisztina M. Zsebo
Name: Krisztina M. Zsebo, Ph.D.
Title: Chief Executive Officer

Date: 5/11/09

UNIVERSITY OF MINNESOTA

EXHIBIT A
Terms and Conditions
Exclusive Patent License Agreement

These terms and conditions to the Exclusive Patent License Agreement ("Terms and Conditions") govern the grant of license by Regents of the University of Minnesota ("University") to the Licensee identified in the Exclusive Patent License Agreement (the "EPLA"). These Terms and Conditions are incorporated by reference into the EPLA. All section references in these Terms and Conditions refer to provisions in these Terms and Conditions unless explicitly stated otherwise.

1. Definitions. For purposes of interpreting the Agreement, the following terms have the following meanings:

1.0 "Active Claim" means a claim of (a) an issued and unexpired Licensed Patent which has not been held unenforceable, unpatentable or invalid by a decision of a court or governmental body of competent jurisdiction in a ruling that is unappealed or unappealable, or (b) a pending Patent Application that has not been pending for more than ten (10) years from the date of the priority date of the Patent Application. If a claim of a pending Patent Application that ceased to be an Active Claim under clause (b) of the preceding sentence because of the passage of time later issues as part of a Licensed Patent within clause (a) of the preceding sentence, then it shall again be considered an Active Claim effective as of the issuance of such Licensed Patent.

1.1 "Affiliate" means an entity which, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with Licensee, but only for so long as such relationship exists. The term "control," as used in the immediately preceding sentence means the beneficial ownership of more than 50% of the shares of the subject entity entitled to vote in the election of directors (or, in the case of an entity that is not a corporation, for the election of the corresponding managing authority).

1.2 "Agreement" means collectively these Terms and Conditions and the EPLA.

1.3 "Change of Control" means:

(i) any consolidation or merger of the Licensee with or into any other corporation or other entity, or any other corporate reorganization, excluding (x) any transaction effected exclusively to change the domicile of the Licensee, (y) any consolidation, merger or reorganization in which the stockholders of the Licensee immediately prior to such consolidation, merger or reorganization, continue to hold at least a majority of the voting power of the surviving entity (if the surviving entity is a wholly-owned subsidiary, its parent) in

substantially the same proportions as were held immediately after such consolidation, merger or reorganization, and (z) a consolidation with a wholly-owned subsidiary of the Licensee;

(ii) any transaction or series of related transactions to which the Licensee is a party in which in excess of 50% of Licensee's voting power is transferred, other than a transaction or series of related transactions with arm's-length financial investors (*e.g.*, venture capital firms), consummated for *bona fide* equity financing purposes, in which cash is received by the Licensee or indebtedness of the Licensee is cancelled or converted, or a combination thereof;

(iii) a sale of all or substantially all of the Licensee's assets; or

(iv) a transaction of any type in which the power to direct or cause the direction of the management or polices of Licensee is transferred to any person, persons, entity or entities, none of which, as of the Effective Date possesses such power. For purposes of clarification, this paragraph (iv) is not intended, and shall not be construed, to cover changes in composition of the Licensee's board of directors resulting from director resignations, removals, appointments, or elections occurring in the ordinary course and not in consideration or as a result of either of the following: {a) any transaction or series of transactions under Section 1.3(ii) above, or (b) the license, sale or transfer to a third party of any right with respect to the Invention(s), the Licensed Patents or the Patent Applications.

1.4 "Commercially Reasonable Efforts" means, with respect to Licensee's efforts to accomplish a particular objective with respect to development and exploitation of the Invention(s), such reasonable and good faith efforts to accomplish such objective as are consistent with the efforts biopharmaceutical companies (defined below) typically devote to invention(s) or other technology of similar market potential and at a similar stage of development as the Invention(s). For purposes of this definition, "biopharmaceutical companies" means companies in the biopharmaceutical industry of a size and stage of development similar to that of Licensee.

1.5 "EPLA" means the Exclusive Patent License Agreement to which these Terms and Conditions are attached as Exhibit A.

1.6 "Field of Use" means the field(s) of use described in section 2 of the EPLA.

1.7 "Identified Product" means any product or good in the Field of Use that is identified, or the utility of which is identified, using any Licensed Technology during the Term; excluding any such product or good that itself constitutes Licensed Technology. The term Identified Product refers only to products and goods identified, manufactured, made, sold, transferred, or otherwise disposed of during the Term.

1.8 "Invention(s)" means the invention(s) expressly disclosed in that certain Invention Disclosure No. No. [...***...], entitled "[...***...], including, without limitation, the inventions claimed in the pending patent application(s) described in section 5.2 of the EPLA.

1.9 “Licensed Patent” means: (a) the patent(s) described in section 5.1 of the EPLA (if any); (b) all patents that issue from any Patent Application or that contain one or more claims directed to Invention(s); and (c) all reissues, reexaminations, renewals, and extensions of any patent referenced in the preceding clauses (a) and (b).

1.10 “Licensed Technology” means any product, method or process, the manufacture, use or sale of which is covered by one or more Active Claims of a Licensed Patent or Patent Application in the country of such manufacture, use or sale.

1.11 “Licensee” means the entity identified in section 1 of the EPLA.

1.12 “Patent Applications” means: (a) all patent applications filed, or that may be filed in the future, claiming any Invention(s), including, without limitation, the pending patent application described in section 5.2 of the EPLA; (b) all foreign patent applications associated with (by priority claim or otherwise) the application(s) referenced in the preceding clause (a), whether now existing or hereafter filed; and (c) all continuations, continuations-in-part, substitutions, and divisionals of the patent applications referenced in the preceding clauses (a) and (b).

1.13 “Patent-Related Expenses” means costs and expenses (including out-of-pocket attorneys’ fees, patent agent fees and governmental filing fees) incurred in preparing, filing and prosecuting the Patent Applications, and maintaining the Licensed Patents.

1.14 “Payment” means a payment to be made by the Licensee to the University specified below in section 6.1 and described in section 11 of the EPLA.

1.15 “Performance Milestone” means an act or event specified below in section 5.1 and described in section 9 of the EPLA.

1.16 “Post-termination Period” means the one hundred eighty (180) day period commencing on the date of termination (but not expiration) of the Term.

1.17 “Territory” means the geographical area described in section 3 of the EPLA.

2. Term. The term of the Agreement commences on the Effective Date as defined in section 4 of the EPLA and, unless terminated earlier as provided below in section 8, expires on the date on which no Active Claim of any Licensed Patent or Patent Application exists in the Territory (the “Term”).

3. Grant of License.

3.1 The Licensee’s Rights. For the avoidance of doubt, and notwithstanding any other provision of the Agreement to the contrary, the University acknowledges and agrees that: (i) the University and the Licensee are joint owners of the Invention(s), the Licensed Patents and the Patent Applications; (ii) at all times during and after the Term, the Licensee has the right to

practice the Invention(s), and to grant licenses to practice the Invention(s) under Licensee's joint ownership interest in the Licensed Patents and the Patent Applications, without the University's consent and, except as set forth in section 11.2 of the EPLA during the Term, without accounting to the University; and (iii) the purpose of this Agreement is to grant the Licensee an exclusive license under the University's joint ownership interest in the Invention(s), the Licensed Patents and the Patent Applications.

3.1.1 Subject to the terms and conditions of this Agreement, the University hereby grants to the Licensee, and the Licensee hereby accepts, an exclusive license under University's interest in the Licensed Patents and the Patent Applications, to practice the Invention(s) in the Field of Use in the Territory, including, without limitation, to make (including to have made on its behalf), use, offer to sell, sell or have sold, offer to lease or lease, import, or otherwise offer to dispose or dispose of any Licensed Technology in the Field of Use (including for the purpose of identifying and developing Identified Products) in the Territory. Subject to the first paragraph of this section 3.1, no provision of the Agreement is to be construed to grant the Licensee, by implication, estoppel or otherwise, any rights (other than the rights expressly granted it in the Agreement) to the Invention(s), a Licensed Patent or Patent Application, or to any other University-owned technology, patent applications, or patents.

3.1.2 The Licensee shall have the right to sublicense its rights under the University's interest in the Invention(s), the Licensed Patents and the Patent Applications to its Affiliates and to third parties. If the Licensee grants any such sublicense, then the Licensee shall deliver to the University a true, correct, and complete copy of the fully-executed sublicense agreement within 30 days after execution, provided that the Licensee may redact from such copies any proprietary scientific or business information that is not necessary to ascertain the Licensee's compliance with the Agreement. Each such sublicense shall expressly state that it is subject in all respects to the applicable provisions of the Agreement and shall not contain any term or condition that is inconsistent with the terms of the Agreement, including without limitation, sections 5.2 - 5.6, 6.3, 8.3, 9.5, and 11.3. Any sublicense attempted to be made or made in violation of this subsection is void and constitutes an event of default under subsection 8.1.1 below.

3.2 The United States Government's Rights. If the University indicated in section 8 of the EPLA that the United States federal government funded the development, in whole or in part, of the Invention(s), then, (i) the federal government may have certain rights in and to the Invention(s) as those rights are described in Chapter 18, Title 35 of the United States Code and accompanying regulations, including Part 401, Chapter 37 of the Code of Federal Regulations, and (ii) the parties' rights and obligations with respect to the Invention(s), including the grant of license set forth above in subsection 3.1.1, are subject to the applicable terms of these laws and regulations.

3.3 The University's Rights. The University retains an irrevocable, world-wide, royalty-free, non-exclusive right (a) to use the Invention(s) for teaching, non-commercial research, and educational purposes and (b) the right to grant non-exclusive licenses to other nonprofit or academic institutions to use the Invention(s) solely for teaching, non-commercial

research, and educational purposes. For the avoidance of doubt, the performance on behalf of, or in collaboration with, a for-profit entity of sponsored research or other services using the Invention(s) does not constitute non-commercial research. Notwithstanding the foregoing, the University shall at all times have the right to use the Invention(s) for the purpose of performing sponsored research on behalf of the Licensee and its Affiliates.

4. Applications and Patents.

4.1 Patent Application Filings during the Term of the Agreement.

4.1.1 The Licensee shall have the first right to prepare, file and prosecute the Patent Applications and to maintain the Licensed Patents, at Licensee's expense. After consultation with and approval (not to be unreasonably withheld or delayed) by the University, the Licensee shall determine in which countries patent application(s) will be filed and prosecuted with respect to the Invention(s), provided that if the University fails to respond within 30 days after the Licensee informs the University that it wishes to file in such country, then the Licensee shall be free to proceed with such filing without the University's approval. The Licensee shall retain counsel reasonably acceptable to the University to file and prosecute such patent applications. The Licensee shall consult with the University as to the preparation, filing and prosecution of the Patent Applications and the maintenance of the Licensed Patents reasonably prior to any deadline or action with the U.S. Patent & Trademark Office or any foreign patent office, and shall furnish to the University copies of all relevant documents reasonably in advance of such deadline or action; *provided*, *however*, that if the University does not provide comments to the Licensee regarding any such filing or other patent office action within 30 days after the Licensee provides a draft of such filing or notice of such proposed action to the University, then the Licensee shall be free to proceed with such filing or other action. The University shall be solely responsible for the fees and costs of its own patent counsel. The Licensee shall keep the University informed of the status of the Licensee's patent preparation, filing, prosecution and maintenance activities, including delivering to the Licensee pertinent notices, written and oral communications with governmental officials, and documents. The Licensee shall also cause its counsel to copy the University on all correspondence (including attachments and enclosures) that pertain to the preparation, filing, prosecution, and maintenance of the Patent Application and Licensed Patent. In the event that the Licensee desires to abandon any Patent Application or Licensed Patent, or if Licensee later declines responsibility for any Patent Application or Licensed Patent, Licensee shall provide reasonable prior written notice to the University of such intention to abandon or decline responsibility (which notice shall, in any event, be given no later than 60 days prior to the next deadline for any action that may be taken with respect to such Patent Application or Licensed Patent with the U.S. Patent & Trademark Office or any foreign patent office), and the University shall have the right, at its expense, to assume responsibility for the preparation, filing prosecution and maintenance of the applicable Patent Application or Licensed Patent.

4.1.2 The grant of license in section 3.1 and the definition of Territory in section 1.17 shall not extend to or include any country in which Licensee elects, in

writing to the University, not to pay or reimburse the payment of the cost, in whole or in part, to seek or maintain intellectual property protection.

4.2 Ownership of the Licensed Patents and Patent Applications. Neither the provisions of the Agreement, nor any termination or expiration of this Agreement, shall affect the Licensee's joint ownership interest in the Licensed Patents or Patent Applications in any manner.

5. Commercialization.

5.1 Commercialization and Performance Milestones. The Licensee shall use its Commercially Reasonable Efforts, consistent with sound and reasonable business practices and judgment, to develop and commercially exploit the Invention(s) as soon as practicable. In furtherance of the objective set forth in the preceding sentence, the Licensee shall perform, or to cause to happen or be performed, as the case may be, all the performance milestones described in section 9 of the EPLA. The University acknowledges that pharmaceutical development and regulatory approval process is inherently uncertain and involves high risks of failure, and that many factors beyond the reasonable control of Licensee may delay or prevent Licensee from achieving a performance milestone. Accordingly, the University agrees to consider in good faith any request by Licensee for an extension of the deadline for the applicable performance milestone(s) if Licensee has used Commercially Reasonable Efforts to achieve such performance milestones, provided that, for purposes of this sentence only, the University shall have the right to withhold its consent if University, in the exercise of its sole discretion, determines that Licensee has not used Commercially Reasonable Efforts to achieve such performance milestones.

5.2 Covenants Regarding the Manufacture of Licensed Technology. The Licensee hereby covenants and agrees to manufacture, use, sell, and transfer Licensed Technology and any Identified Products in compliance with all applicable federal and state laws, including all federal export laws and regulations. The Licensee hereby further covenants and agrees that, to the extent required by 35 United States Code Section 204, it shall, and it shall cause each sublicensee, to substantially manufacture in the United States of America all products embodying or produced through the use of Licensed Technology that is subject to the rights of the federal government of the United States of America.

5.3 Export and Regulatory Compliance. The Licensee understands that the Arms Export Control Act (AECA), including its implementing International Traffic In Arms Regulations (ITAR), and the Export Administration Act (EAA), including its Export Administration Regulations (EAR), are some (but not all) of the laws and regulations that comprise the U.S. export laws and regulations. Licensee further understands that the U.S. export laws and regulations include (but are not limited to): (i) ITAR and EAR product/service/data-specific requirements; (ii) ITAR and EAR ultimate destination-specific requirements; (iii) ITAR and EAR end user-specific requirements; (iv) Foreign Corrupt Practices Act; and (v) antiboycott laws and regulations. The Licensee shall comply with all then-current applicable export laws and regulations of the U.S. Government (and other applicable U.S. laws and regulations) pertaining to the Licensed Technology (including any associated products, items, articles,

computer software, media, services, technical data, and other information). The Licensee certifies that it shall not, directly or indirectly, export (including any deemed export), nor re-export (including any deemed re-export) the Licensed Technology (including any associated products, items, articles, computer software, media, services, technical data, and other information) in violation of U.S. export laws and regulations or other applicable U.S. laws and regulations. The Licensee shall include an appropriate provision in its agreements with its authorized sublicensees to assure that these parties comply with all then-current applicable U.S. export laws and regulations and other applicable U.S. laws and regulations.

5.4 Progress Reports. Throughout the Term, and within thirty (30) days of the date specified in the schedule set forth in section 10 of the EPLA, the Licensee shall deliver to the University written reports of the Licensee's and the sublicensees' efforts and plans to (i) develop and commercialize Licensed Technology and (ii) reach the Performance Milestones and the Triggering Events; provided that once a Triggering Event has occurred, progress reports concerning other Triggering Events are not required.

5.5 Use of the University's Name and Trademarks or the Names of University Faculty, Staff, or Students. No provision of the Agreement grants the Licensee or sublicensee any right or license to use the name, logo, or any marks owned by or associated with the University or the names, or identities of any member of the faculty, staff, or student body of the University. The Licensee shall not use and shall not permit a sublicensee to use any such logos, marks, names, or identities without the University's and, as the case may be, such member's prior written approval. Notwithstanding the foregoing, the Licensee may state that the University is a joint owner of the Invention(s), Patent Applications and Licensed Patents, and that the Licensee has an exclusive license under the University's interest therein, in financing documents, in communications with investors, potential investors and potential sublicensees, in required securities filings, or as otherwise required by applicable law.

5.6 Governmental Markings.

5.6.1 If feasible, the Licensee shall mark all physical embodiments of Licensed Technology (including packaging material) that Licensee sells or transfers to any third party with patent notice appropriate under Title 35, United States Code.

5.6.2 The Licensee is responsible for obtaining all necessary governmental approvals for the production, development, distribution, sale, and use of the Licensed Technology, at the Licensee's expense. The Licensee is responsible for including with any physical embodiment of Licensed Technology that Licensee sells or transfers to any third party, any relevant warning labels, packaging and instructions as to the use of the Licensed Technology.

5.6.3 The Licensee agrees to register the Agreement with any foreign governmental agency that requires such registration, and the Licensee shall pay all costs and legal fees in connection with such registration. The Licensee shall comply with all foreign laws affecting the Agreement or the use or sale of the Licensed Technology.

6. Payments, Reimbursements, Reports, and Records.

6.1 Payments. The Licensee shall pay all amounts due under the Agreement by check (payable to the "Regents of the University of Minnesota" and sent to the address specified below in section 23), wire transfer, or any other mutually agreed-upon method of payment.

6.2 Interest. All amounts due under the Agreement shall bear interest as provided in section 11 of the EPLA on the entire unpaid balance computed from the due date until the amount is paid.

6.3 Inspection of Records. During the Term and for one (1) year thereafter, University shall have the right to cause an independent, certified public accountant reasonably acceptable to Licensee to inspect: (a) any and all agreements to which Licensee is a party that relate to the practice, use, license, sale or transfer of any Licensed Technology and associated documentation, solely for the purposes of ascertaining whether and when the first Triggering Event has occurred and whether and when the performance milestones described in section 9 of the EPLA have been achieved; and (b) all Licensed Patent and Patent Application filings and other patent office submissions with respect thereto, all correspondence between the Licensee (or its patent counsel) and any patent office relating to any Licensed Patent or Patent Application, and all other documentation relating to the prosecution of Patent Applications or the maintenance of Licensed Patents. Licensee shall have no obligation to provide access to any information of Licensee's other than that specified in the preceding sentence. Licensee may require such accountant to execute a reasonable written confidentiality agreement with Licensee as a condition to allowing such inspection. University agrees that such accountant shall have the right to disclose to University only such information as is necessary to determine whether and when the first Triggering Event has occurred. Such inspection may be conducted during normal business hours upon reasonable prior written notice to Licensee, provided that University shall not have the right to cause such inspection more than once per year. University shall bear the full cost of such inspection unless such inspection discloses that Licensee failed to timely notify University of the first Triggering Event to occur, in which case, Licensee shall bear the full cost of such inspection and shall promptly remit to University the amount of any underpayment of annual license fees resulting from failure to report such occurrence.

6.4 Currency and Checks. All payments made under the Agreement shall be in United States dollars. All computations and payments made under the Agreement shall be in United States dollars. To determine the dollar value of transactions conducted in non-United States dollar currencies, the parties shall use the exchange rate for the currency into dollars as reported in the Wall Street Journal as the New York foreign exchange mid-range rate on the last business day of the month in which the transaction occurred.

7. Infringement.

7.1 If a party learns of substantial, credible evidence that a third party is making, using, or selling a product in the Field of Use in the Territory that infringes a Licensed Patent, such party shall promptly notify the other party in writing of the possible infringement and in such notice describe in detail (to the extent known) the information suggesting infringement of

the Licensed Patent. Prior to commencing any action to enforce a Licensed Patent, the parties shall consult with each other in good faith regarding the alleged infringement and potential enforcement activity. The Licensee shall have the first right to bring and control any action or proceeding with respect to such infringement, at its own expense and by counsel of its own choice reasonably acceptable to the University. At the request of the University, such counsel shall at Licensee's expense represent the University in the event the University is joined as an indispensible party in such action, subject to any applicable rules of professional conduct. If the Licensee fails to bring any such action or proceeding within 120 days following the notice of alleged infringement, then the University shall have the right to bring and control any such action at its own expense and by counsel of its own choice. If a party brings any such infringement action pursuant to this section 7.1, the other party shall provide reasonable cooperation to the enforcing party at the enforcing party's request and expense and shall use reasonable efforts to permit access by the enforcing party to relevant personnel, records, papers, information, samples and specimens during regular business hours.

7.2 If any suit, action or proceeding is brought or commenced against the Licensee alleging the infringement of a patent or other intellectual property right owned by a third party by reason of the manufacture, use or sale of the Licensed Technology, the Licensee shall give the University prompt notice thereof. If any third party institutes any suit, action or proceeding challenging the validity of a Licensed Patent, neither party shall have the right to make any settlement or compromise which affects the scope, validity, enforceability or otherwise the Licensed Patent without the other party's prior written approval.

8. Termination.

8.1 By the University.

8.1.1 If the Licensee breaches or fails to perform one or more of its obligations under the Agreement, the University may deliver a written notice of default to the Licensee. Without further action by a party, the Agreement shall terminate if the default has not been cured in full within (x) thirty (30) days after the delivery to the Licensee of the notice of default if the default relates to a payment or reimbursement obligation under this Agreement or (y) ninety (90) days after the delivery to the Licensee of the notice of default if the default relates to any other matter.

8.1.2 The University may terminate the Agreement by delivering to the Licensee a written notice of termination at least ten (10) days before the date of termination if the Licensee (i) is adjudicated insolvent; (ii) voluntarily files or has filed against it a petition under applicable bankruptcy or insolvency laws that the Licensee fails to have released within thirty (30) days after filing; (iii) proposes any dissolution, composition, or financial reorganization with creditors or if a receiver, trustee, custodian, or similar agent is appointed; or (iv) makes a general assignment for the benefit of creditors.

8.1.3 The University may terminate the Agreement immediately by delivering to the Licensee a written notice of termination if the Licensee or its agents or

representatives commences or maintains an action in any court of competent jurisdiction or a proceeding before any governmental agency asserting or alleging, in any respect, the invalidity or unenforceability of any of the Licensed Patents or Patent Applications.

8.2 By the Licensee. The Licensee may terminate this Agreement for any reason or for no reason upon ninety (90) days' written notice to the University.

8.3 Effect on Sublicenses. Any sublicense agreement that was in effect between Licensee and any Affiliate or third party immediately prior to any termination of this Agreement shall survive as a license solely under Licensee's joint ownership interest in the Invention(s), Licensed Patents and Patent Applications, and such Affiliate or third party shall have no further right or license under University's joint ownership interest in the Invention(s), Licensed Patents and Patent Applications (*i.e.*, any exclusivity of such Affiliate's or third party's access or rights with respect to the Invention(s), Licensed Patents and Patent Applications shall effectively terminate).

9. Release, Indemnification, and Insurance.

9.1 The Licensee's Release. For itself and its employees, the Licensee hereby releases the University and its regents, employees, and agents forever from any and all suits, actions, claims, liabilities, demands, damages, losses, or expenses {including reasonable attorneys' and investigative expenses) relating to or arising out of the Licensee's exercise or attempt to exercise any of the rights or licenses granted it under this Agreement, including, without limitation, the manufacture, use, lease, sale, or other disposition of the Licensed Technology or Identified Products, and the Licensee's breach of any term of this Agreement.

9.2 The Licensee's Indemnification. Throughout the Term and thereafter, the Licensee shall indemnify, defend, and hold the University and its regents, employees, and agents {each, a "University Indemnitee") harmless from all suits, actions, claims, liabilities, demands, damages, losses, or expenses, including reasonable attorneys' and investigative expenses (collectively, "Losses"), with respect to any third party claim relating to or arising out of the Licensee's exercise or attempt to exercise any of the rights or licenses granted it under this Agreement, including, without limitation, the manufacture, use, lease, sale, or other disposition of the Licensed Technology or Identified Products, or the Licensee's breach of any term of this Agreement; except, in each case, to the extent such Losses result from the gross negligence or willful misconduct of any University Indemnitee or the University's breach of any term of this Agreement.

9.3 The University's Indemnification. Subject to the Damage Cap set forth below in section 11.2, throughout the Term and thereafter, the University shall indemnify, defend, and hold the Licensee and its directors, employees, and agents harmless from all Losses with respect to any third party claim relating to or arising out of the gross negligence or willful misconduct of any University Indemnitee or the University's breach of any term of this Agreement.

9.4 The Licensee's Insurance.

9.4.1 Throughout the Term, or during such other period as the parties agree in writing, the Licensee shall maintain, and shall cause each sublicensee to maintain, in full force and effect comprehensive general liability ("CGL") insurance, with commercially reasonable claim limits in light of the Licensee's activities under this Agreement. From and after the first commercial sale of any Licensed Technology by Licensee or a sublicensee, such insurance policy shall include coverage for claims by a third party against the Licensee or the University arising out of the purchase or use of Licensed Technology. Such insurance policy must name the University as an additional insured if the University so requests in writing. Upon receipt of the University's written request, the Licensee shall deliver to the University a copy of the certificate of insurance for such policy.

9.4.2 The provisions of subsection 9.4.1 do not apply if the University agrees in writing to accept the Licensee's or a sublicensee's, as the case may be, self-insurance plan as adequate insurance.

9.5 Sublicensees - Release. The Licensee shall cause each sublicensee to grant the University a release from liabilities substantially similar to the release granted in favor of the University above in section 9.1.

10. Warranties.

10.1 Authority. Each party represents and warrants to the other party that it has full corporate power and authority to execute, deliver, and perform the Agreement, and that no other corporate proceedings by such party are necessary to authorize the party's execution or delivery of the Agreement. In addition, the University represents and warrants to the Licensee that this Agreement does not conflict with any other agreement to which the University is a party as of the Effective Date of this Agreement, and that the University has not granted to any third party (other than as described in section 3.3) any license, option or other rights with respect to the University's interest in the Invention(s), Patent Applications or Licensed Patents.

10.2 Disclaimers.

10.2.1 **EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT, EACH PARTY DISCLAIMS AND EXCLUDES ALL WARRANTIES, EXPRESS AND IMPLIED, CONCERNING THE LICENSED TECHNOLOGY, EACH LICENSED PATENT, EACH PATENT APPLICATION, AND EACH IDENTIFIED PRODUCT, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF NON-INFRINGEMENT, OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE.**

10.2.2 Each party expressly disclaims any warranties concerning and makes no representations:

(i) that the Patent Applications will be allowed or granted or that a patent will issue from any Patent Application;

(ii) concerning the validity, interpretation of claims or scope of any Licensed Patent; or

(iii) that the exercise of the rights or licenses granted to the Licensee under the Agreement will not infringe a third party's patent or violate its intellectual property rights.

11. Damages.

11.1 Remedy Limitation. **EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, IN NO EVENT SHALL EITHER PARTY BE LIABLE FOR (A) PERSONAL INJURY OR PROPERTY DAMAGES (EXCEPT TO THE EXTENT OF SUCH PARTY'S WILLFUL, WANTON, OR INTENTIONAL ACTS) OR (B) LOST PROFITS, LOST BUSINESS OPPORTUNITY, INVENTORY LOSS, WORK STOPPAGE, LOST DATA OR ANY OTHER RELIANCE OR EXPECTANCY, DIRECT OR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OF ANY KIND ARISING OUT OF THIS AGREEMENT;** *provided, however*, that this section 11.1 shall not be construed to limit either party's indemnification obligations with respect to third party claims under sections 9.2 and 9.3.

11.2 Damage Cap. **EXCEPT IN THE CASE OF THE UNIVERSITY'S FRAUD OR WILLFUL MISCONDUCT, IN NO EVENT SHALL THE UNIVERSITY'S TOTAL LIABILITY FOR THE BREACH OR NONPERFORMANCE OF THE AGREEMENT EXCEED THE AMOUNT OF PAYMENTS PAID TO THE UNIVERSITY UNDER SECTION 6.1 OF THE AGREEMENT. THIS LIMITATION APPLIES TO CONTRACT, TORT, AND ANY OTHER CLAIM OF WHATEVER NATURE.**

11.3 Sublicensees - Damages. The Licensee shall cause each sublicensee to agree to limitations of remedies and damages substantially similar to the limitations of remedies and damages set forth above in sections 11.1 and 11.2.

12. Amendment and Waiver. The Agreement may be amended from time to time only by a written instrument signed by the parties. No term or provision of the Agreement may be waived and no breach excused unless such waiver or consent is in writing and signed by the party claimed to have waived or consented. No waiver of a breach is to be deemed a waiver of a different or subsequent breach.

13. Assignment. Except as permitted under section 14 of these Terms and Conditions, the Licensee shall not assign the Agreement or any of its rights and obligations hereunder without the University's prior written consent. Any assignment attempted to be made in violation of this section is void. Absent the consent of all the parties, an assignment will not release the assigning

party from its obligations. The Agreement inures to the benefit of the Licensee and the University and their respective successors, permitted assigns and trustees.

14. Change of Control and Assignment to Affiliate.

A. **Change of Control.** Notwithstanding section 13 above, the Licensee may assign this Agreement and its rights and obligations hereunder, without the consent or approval of the University, in connection with a Change of Control,

B. **Assignment to Affiliate**. Notwithstanding section 13 above, the Licensee, without the prior approval of the University, may assign all, but no less than all, its rights and delegate all its duties under the Agreement to an Affiliate if the Licensee delivers to the University written notice of the proposed assignment (along with pertinent information about the terms of the assignment and assignee) at least ninety (90) days before the effective date of the assignment.

15. Applicable Law. The internal laws of the state of Minnesota, without giving effect to its conflict of laws principles, govern the validity, construction, and enforceability of the Agreement.

16. Access to University Information.

16.1 Data Practices Act. The parties acknowledge that the University is subject to the terms and provisions of the Minnesota Government Data Practices Act, Minnesota Statutes §13.01 *et seq.* (the "Act"), and that the Act requires, with certain exceptions, the University to permit the public to inspect and copy any information that the University collects, creates, receives, maintains, or disseminates.

16.2 Limited Confidentiality. To the extent permitted by law, including as provided in the Act, the University shall hold in confidence and disclose only to University employees, agents and contractors who need to know the information disclosed or made available by the Licensee to the University pursuant to sections 4.1, 5.4, 6.3 and 7. No provision of the Agreement is to be construed to further prohibit, limit, or condition the University's right to use and disclose any information in connection with enforcing the Agreement, in court or elsewhere.

17. Consent and Approvals. Except as otherwise expressly provided, in order to be effective, all consents or approvals required under the Agreement must be in writing.

18. Construction. The headings preceding and labeling the sections of the Agreement are for the purpose of identification only and are not to be employed or used for the purpose of construction or interpretation of any portion of EPLA. As used herein and where necessary, the singular includes the plural and vice versa, and masculine, feminine, and neuter expressions are interchangeable.

19. Enforceability. If a court of competent jurisdiction adjudges a provision of the Agreement to be unenforceable, invalid, or void, such determination is not to be construed as

impairing the enforceability of any of the remaining provisions hereof and such provisions will remain in full force and effect.

20. Entire Agreement. The parties intend the Agreement (including all attachments, exhibits, and amendments hereto) to be the final and binding expression of their contract and agreement and the complete and exclusive statement of the terms thereof. The Agreement cancels, supersedes, and revokes all prior negotiations, representations and agreements among the parties, whether oral or written, relating to the subject matter of the Agreement.

21. No Third-Party Beneficiaries. No provision of the Agreement, express or implied, is intended to confer upon any person other than the parties to the Agreement any rights, remedies, obligations, or liabilities hereunder. No sublicensee may enforce or seek damages under the Agreement.

22. Language. In order to be effective, all notices, reports, and other documents and instruments that a party elects or is required to deliver to the other party must be in English.

23. Notices. In order to be effective, all notices, requests, and other communications that a party is required or elects to deliver must be in writing and must be delivered personally, or by facsimile or electronic mail (provided such delivery is confirmed), or by a recognized overnight courier service or by United States mail, first-class, certified or registered, postage prepaid, return receipt requested, to the other party at its address set forth below or to such other address as such party may designate by notice given under this section:

If to the University:	University of Minnesota Office for Technology Commercialization Attn: Contracts Manager 1000 Westgate Drive, Suite 160 St. Paul, MN 55114 Phone: 612.624.0550 Fax: 612.624.6554 E-mail: [...***...]@umn.edu Web site: http://www.research.umn.edu/techcomm
For notices sent under section 8, with a copy to:	University of Minnesota Office of the General Counsel Attn: Transactional Law Services 360 McNamara Alumni Center 200 Oak Street S.E. Minneapolis, MN 55455-2006 Facsimile No.: 612.626.9624 E-mail: [...***...]@mail.ogc.umn.edu
If to the Licensee:	As indicated in section 12 of the EPLA.

*****Confidential Treatment Requested**

24. Publicity. Each party may disclose to the public the execution and delivery of the Agreement along with the other party's name and the title(s) of the Invention(s).

25. Relationship of Parties. In entering into, and performing their duties under the Agreement, the parties are acting as independent contractors and independent employers. No provision of the Agreement creates or is to be construed as creating a partnership, joint venture, or agency relationship between the parties. No party has the authority to act for or bind the other party in any respect.

26. Security Interest. In no event may the Licensee grant, or permit any person to assert or perfect, a security interest in the Licensee's rights under the Agreement or in University's ownership interest in any Licensed Patent or Patent Application.

27. Survival. Immediately upon the termination or expiration of the Agreement, the license granted to the Licensee under the Agreement shall terminate. Neither termination nor expiration of the Agreement shall relieve either party from any obligations accrued to the date of such termination. The parties' respective obligations and rights set forth in sections 6.1, 9, 10.2, 11 through 23, 27 and 28 of these Terms and Conditions also survive the termination or expiration of the Agreement.

28. Forum Selection. A suit, claim, or other action to enforce the terms of the Agreement may be brought only in the state courts of Hennepin County, Minnesota. The Licensee hereby submits to the jurisdiction of that court and waives any objections it may have to that court asserting jurisdiction over the Licensee or the subject matter of this Agreement.

Exhibit 10.20

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

NON-EXCLUSIVE LICENSE AGREEMENT

THIS NON-EXCLUSIVE LICENSE AGREEMENT (the ***"Agreement"***) is entered into as of November 4, 2010 (the ***"Effective Date"***), by and between **CELLADON CORPORATION**, a California corporation (***"Celladon"***), having offices at 2223 Avenida de la Playa, Suite 205, La Jolla, California 92037, and **VIROVEK INCORPORATION**, a California corporation (***"Virovek"***), having offices at 3521 Investment Boulevard, Suite 1, Hayward, CA 94545.

WHEREAS, Virovek has developed and owns certain intellectual property, including the Patent Rights and Trade Secrets; and

WHEREAS, Celladon wishes to obtain, and Virovek is willing to grant, a non-exclusive, worldwide license under the Patent Rights and Trade Secrets to develop a Celladon In Vitro Screening Reagent (as defined below) to be commercialized as part of an *in vitro* neutralizing antibody assay (***"NAb Assay"***) for use with Celladon Product (as defined below), on the terms and subject to the conditions set forth herein.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, the parties hereto hereby agree as follows:

1. DEFINITIONS

1.1 "Affiliate" shall mean any company or entity controlled by, controlling, or under common control with a party hereto and shall include any company more than 50% of whose voting stock or participating profit interest is owned or controlled, directly or indirectly, by a party, and any company which owns or controls, directly or indirectly, more than 50% of the voting stock of a party.

1.2 "Celladon In Vitro Screening Reagent" shall mean an AAV1/GFP vector reagent, the manufacture, use, sale, offer for sale or import of which, (a) in the absence of a license under the Patent Rights, would infringe at least one Valid Claim of the Patent Rights and/or (b) uses or otherwise incorporates the Trade Secrets.

1.3 "Celladon Product" shall mean an adeno-associated virus with a SERCA2a transgene (AAV1/SERCA2a) enzyme replacement therapy, including, without limitation, Celladon's proprietary MYDICAR® product.

1.4 "Confidential Information" shall have the meaning provided in Section 5.1.

1.5 "Field" shall mean the performance of Tests to determine the suitability of patients for treatment with Celladon Product.

1.6 "First Commercial Sale" shall mean the first sale of Services to a Third Party in the Field by Celladon or its sublicensees.

1.7 "NAb Assay" shall have the meaning set forth in the recitals.

1.8 “Patent Rights” shall mean:

(a) the patents and patent applications listed on ***Exhibit A*** attached hereto and any patents or patent applications filed or granted in the future, that are owned by or licensed to Virovek and which cover the composition, manufacture or use of an AAVI/GFP vector reagent using Virovek’s proprietary AAV baculovirus technology;

(b) any and all divisionals, continuations and continuations-in-part of the patents and patent applications referenced in the preceding subsection (a);

(c) the foreign patent applications associated with the patent applications referenced in the preceding subsections (a) and (b);

(d) the patents issued or issuing from the patent applications referenced in the preceding subsections (a) through (c); and

(e) reissues, reexaminations, restorations (including supplemental protection certificates) and extensions of any patent or patent application referenced in the preceding subsections (a) through (d).

1.9 “Royalty Term” shall have the meaning provided in Section 3.3.

1.10 “Services” shall mean the performance of Tests.

1.11 “Service Revenues” shall mean all up front, annual, milestone, royalty and other payments received by Celladon based upon and as a result of the commercial sale of Services by Celladon, its Affiliates and its and their respective sublicensees to Third Parties.

1.12 “Test” shall mean an *in vitro* test (including, without limitation, an NAb Assay) that incorporates or otherwise uses Celladon In Vitro Screening Reagent.

1.13 “Third Party” shall mean any entity other than Celladon or Virovek or an Affiliate of Celladon or Virovek.

1.14 “Valid Claim” shall mean a claim of an issued and unexpired patent included within the Patent Rights, which claim has not been revoked or held unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction (which decision is not appealable or has not been appealed within the time allowed for appeal) and which claim has not been disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or otherwise.

1.15 “Virovek Recombinant Baculoviruses” shall mean the recombinant baculoviruses owned or controlled by Virovek that may be used to manufacture AAV1/GFP vector reagents.

1.16 "Trade Secrets" shall mean the proprietary and/or confidential compositions, articles, and methods including manufacturing expertise and know-how in possession of Virovek related to the production and/or use of the Virovek Recombinant Baculoviruses but not explicitly described in the Patent Rights.

2. GRANT OF LICENSE

2.1 License Grant. Subject to the terms and conditions of this Agreement, Virovek hereby grants to Celladon a non-exclusive, royalty-bearing, worldwide license and sublicense, including the right to grant sublicenses through multiple tiers of sublicense, under the Patent Rights and Trade Secrets to make, have made, use, sell, have sold, offer for sale and import Celladon In Vitro Screening Reagents for use in the Field.

2.2 Sublicensing. Celladon may grant sublicenses under this Agreement only pursuant to a written sublicense agreement containing terms and conditions consistent with the terms and conditions of this Agreement.

2.3 No Implied Licenses. No license, option or other right under any intellectual property rights of either party is granted or shall be granted by implication. All such licenses, options or other rights are or shall be granted only as expressly provided in the terms of this Agreement.

2.4 Manufacturing Transfer and Trade Secrets. Promptly following the Effective Date, Virovek shall use commercially reasonable efforts to facilitate and assist in the transfer of the Virovek Recombinant Baculoviruses to Third Party contract organization(s) designated by Celladon. In connection with such transfer, Virovek shall also share and deliver the Trade Secrets, including its manufacturing expertise and know-how, to Celladon and such Third Party contractor(s) to enable such Third Party contractor(s) to manufacture and test AAV1/GFP vector reagents, starting materials, and in-process components. If Celladon determines that on-site expertise is required to enable the Third Party contractor(s) to manufacture the AAV1/GFP vector reagents, Celladon may request that a Virovek expert travel to Celladon's or such Third Party contractor's site to provide assistance and know-how regarding the manufacture of AAV1/GFP vector reagents. Upon such request, Virovek shall use commercially reasonable efforts to make such expert available to Celladon as requested. In such event, Celladon shall be responsible to pay for the reasonable and documented travel expenses of such expert in providing on-site services, including flights, lodging and meals. In addition, Celladon shall compensate Virovek at the rate of $[...***...] per hour (for a maximum of eight hours per day) for the performance of the requested services; *provided* that Celladon shall pay only 50% of such hourly fee for the travel time to and from Celladon's or such Third Party contractor's site. Celladon shall be responsible: (a) to ensure that each such Third Party contractor is bound by confidentiality obligations with respect to the Trade Secrets at least as stringent as those contained herein; and (b) for any breach of this Agreement by any of such Third Party contractors.

2.5 Diligence. Celladon shall use commercially reasonable efforts, either itself or through its Affiliates or sublicensees, to develop and commercialize Tests in the Field.

2.6 Regulatory Filings and Matters. Celladon shall be solely responsible for making all regulatory filings and seeking all regulatory approvals that Celladon determines in its sole discretion to be necessary or appropriate in connection with the development and commercialization of Tests.

3. PAYMENT OBLIGATIONS

3.1 License Fee. Celladon shall pay to Virovek a non-refundable license fee of US$15,000 (the "License Fee") on the Effective Date.

3.2 Maintenance Fees. Celladon shall pay to Virovek an annual non-refundable maintenance fee of US$20,000 (the ***"Annual Maintenance Fees"***) on each anniversary of the Effective Date during the term of this Agreement; *provided* that all Annual Maintenance Fees paid by Celladon shall be fully creditable toward royalties due under Section 3.3 below. For the avoidance of doubt, by crediting the Annual Maintenance Fees toward royalties, Celladon shall be obligated to pay Virovek royalties as provided in Section3.3 only to the extent such royalties during the calendar year in which the royalties were earned exceed the Annual Maintenance Fee.

3.3 Royalties. Subject to Sections 3.2 and 3.4, during the Royalty Term Celladon shall pay to Virovek [...***...] % of Service Revenues; *provided* that if, during the Royalty Term, the manufacture, use, sale, offer for sale or import of AAV1/GFP vector reagent used in the Tests is no longer covered by at least one Valid Claim of the Patent Rights or by at least one claim of a pending patent application included within the Patent Rights, the royalties payable under this Section 3.3 shall be reduced to [...***...] % of Service Revenues. Royalties under this Section 3.3 shall be paid, on a Test-by-Test and country-by-country basis: (a) in the case of any Services using a Test covered by a Valid Claim of the Patent Rights in any country, the period of time from First Commercial Sale of Services using a Test in a country until the expiration of the last-to-expire Valid Claim of the Patent Rights claiming the manufacture, use, sale, offer for sale or import of Celladon In Vitro Screening Reagent used in such Test in such country; and (b) in the case of any Services using a Test covered solely by Trade Secrets in any country, the period of time commencing on the First Commercial Sale in such country and ending 10 years from the date of First Commercial Sale in such country (the ***"Royalty Term"***).

3.4 Third Party Licenses. In the event that Celladon or its Affiliates or sublicensees are required to obtain one or more licenses under patents of Third Parties that, in the absence of such license(s), would be infringed by the manufacture, use, sale, offer for sale or import of a Test, the percentage royalty payment due to Virovek under Section 3.3 shall be reduced by 50%.

4. PAYMENTS; RECORDS; AUDITS

4.1 Payment; Reports. Royalty payments and reports of Service Revenues shall be calculated and reported for each calendar quarter. All royalty payments due to Virovek under this Agreement shall be paid within 60 days of the end of each calendar quarter. Each payment

of royalties shall be accompanied by a report of Service Revenues in sufficient detail to permit confirmation of the accuracy of the royalty payments made, including, without limitation, the identity of the sublicensees selling the Services, the gross sales and net sales of the Services, the royalties payable and the method used to calculate the royalty.

4.2 Exchange Rate; Manner and Place of Payment. All payments hereunder shall be payable in U.S. dollars. With respect to each quarter, for countries other than the United States, whenever conversion of royalty payments from any foreign currency shall be required, such conversion shall be made at the rate of exchange reported in *The Wall Street Journal* on the last business day of such quarter. All payments owed under this Agreement shall be made by wire transfer to a bank and account designated in writing by Virovek, unless otherwise specified in writing by Virovek.

4.3 Taxes. Virovek will pay any and all taxes levied on account of any payments made to it under this Agreement. If any taxes are required to be withheld by Celladon, Celladon will (a) deduct such taxes from the payment made to Virovek, (b) timely pay the taxes to the proper taxing authority, and (c) send proof of payment to Virovek and certify its receipt by the taxing authority within 30 days following such payment.

4.4 Records and Audits. Celladon shall keep for a period covering at least the preceding two years complete and accurate records pertaining to receipt of Service Revenues in sufficient detail to permit Virovek to confirm the accuracy of the royalty payments made hereunder. Virovek shall have the right to cause an independent, certified public accountant reasonably acceptable to Celladon to audit such records for a period covering not more than the preceding two years for the purpose of verifying any amounts payable under this Agreement. Such audits may be exercised during normal business hours upon reasonable prior written notice to Celladon. Prompt adjustments shall be made by the parties to reflect the results of such audit. Virovek shall bear the full cost of such audit, unless such audit discloses a variance of more than 10% from the amounts actually due, in which case Celladon shall bear the full cost of such audit.

5. CONFIDENTIALITY

5.1 Confidentiality. Except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the parties, the parties agree that, during the term of this Agreement and for five years thereafter, each party shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as expressly provided for in this Agreement any information furnished to it by the other party pursuant to this Agreement (collectively, ***"Confidential Information"***). Each party may use Confidential Information of the other party only to the extent required to accomplish the purposes of this Agreement. Each party will use at least the same standard of care as it uses to protect proprietary or confidential information of its own to ensure that its employees, agents, consultants and other representatives do not disclose or make any unauthorized use of the other party's Confidential Information, which standard of care shall be not less than reasonable care. Each party will promptly notify the other upon discovery of any unauthorized use or disclosure of the other party's Confidential Information.

5.2 Exceptions. Confidential Information of a party (the ***"disclosing party"***) shall not include any information which the other party (the ***"receiving party"***) can prove by competent evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the receiving party in breach of this Agreement, generally known or available; (b) is known by the receiving party at the time of receiving such information, as evidenced by its previously-existing written records; (c) is hereafter furnished to the receiving party by a Third Party, as a matter of right and without restriction on disclosure; or (d) is independently discovered or developed by the receiving party without the use of Confidential Information belonging to the disclosing party.

5.3 Authorized Disclosure. The receiving party may disclose Confidential Information to the extent such disclosure is reasonably necessary in filing or prosecuting patent applications, prosecuting or defending litigation or complying with applicable governmental regulations, provided that if the receiving party is required to make any such disclosure of the Confidential Information, it will to the extent practicable give reasonable advance notice to the disclosing party of such disclosure requirement and, except to the extent inappropriate in the case of patent applications, will cooperate with the disclosing party's efforts to secure confidential treatment of such information required to be disclosed at the request and expense of the disclosing party.

6. PATENT RIGHTS

6.1 Filing, Prosecution and Maintenance of the Patent Rights. Virovek shall have the sole right to file, prosecute and maintain the Patent Rights, at Virovek's sole expense. During the term of this Agreement, Virovek shall take all commercially reasonable actions necessary to file, defend, prosecute and maintain the Patent Rights. In the event that Virovek desires to abandon, or to cease the diligent prosecution, maintenance and/or defense of, any Patent Right, Virovek shall provide reasonable prior written notice to Celladon of such intention to abandon or cease diligent prosecution, maintenance and/or defense (which notice shall, in any event, be given no later than 60 days prior to the next deadline for any action that may be taken with respect to such Patent Right with the U.S. Patent & Trademark Office or any foreign patent office), and, at Celladon's request, Virovek shall consider in good faith permitting Celladon, at its expense, to prosecute, maintain and defend such Patent Right, such permission not to be unreasonably withheld.

6.2 Infringement By Third Parties. Virovek and Celladon shall promptly notify the other in writing upon becoming aware of any alleged or threatened infringement of any of the Patent Rights, where the infringing activity is competitive with the Services. Virovek shall have the first right to bring and control any action or proceeding with respect to any such infringement at its own expense and by counsel of its own choice. If Virovek fails to bring any such action or proceeding within (a) 120 days following the notice of alleged infringement or (b) 30 days before the time limit, if any, set forth in the appropriate laws and regulations for the filing of such actions, whichever comes first, or elects not to bring such action or proceeding, then Celladon shall have the right to bring and control any such action at its own expense and by counsel of its own choice. In the event a party brings an infringement action in accordance with

this Section 6.2, the other party shall cooperate fully, including, if required to bring such action, the furnishing of a power of attorney or being named as a party. Except as otherwise agreed to by the parties as part of a cost-sharing arrangement, any recovery realized as a result of such litigation, after reimbursement of any litigation expenses of Virovek and Celladon, shall be retained by the party that brought and controlled such litigation for purposes of this Agreement.

7. REPRESENTATIONS AND WARRANTIES

7.1 Mutual Representations and Warranties. Each party represents and warrants to the other that, as of the Effective Date: (a) it is duly organized and validly existing under the laws of its jurisdiction of incorporation or formation, and has full corporate or other power and authority to enter into this Agreement and to carry out the provisions hereof; (b) it is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder, and the person or persons executing this Agreement on its behalf has been duly authorized to do so by all requisite corporate action; and (c) this Agreement is legally binding upon it, enforceable in accordance with its terms, and does not conflict with any agreement, instrument or understanding, oral or written, to which it or its Affiliates is a party or by which it or its Affiliates may be bound, nor violate any material law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it or its Affiliates.

7.2 Virovek Representations and Warranties. Virovek hereby represents and warrants to Celladon that:

(a) Virovek has the full legal power, authority and right to grant the license under the Patent Rights and Trade Secrets that it purports to grant hereunder, to transfer the Virovek Recombinant Baculoviruses and Trade Secrets to Celladon, to authorize the further transfer of the Virovek Recombinant Baculoviruses and Trade Secrets by Celladon to Affiliates and sublicensees, and to perform its other obligations under this Agreement;

(b) neither the transfer of the Virovek Recombinant Baculoviruses and Trade Secrets to Celladon, nor the further transfer of the Virovek Recombinant Baculoviruses and Trade Secrets by Celladon to Affiliates and sublicensees, conflicts with or would result in the breach or violation of the terms of any agreement between Virovek and any Third Party;

(c) other than the license and sublicense granted pursuant to Section 2.1, there are no licenses or other rights that are necessary for the transfer of the Virovek Recombinant Baculoviruses and Trade Secrets to Celladon, its Affiliates and its and their respective sublicensees or for the use of the Virovek Recombinant Baculoviruses and Trade Secrets to develop and manufacture Celladon In Vitro Screening Reagent for use in the Field;

(d) the use of the Virovek Recombinant Baculoviruses to develop and manufacture Celladon In Vitro Screening Reagent for use in the Field does not infringe any issued patents of any Third Party and Virovek has not received any notice, and is not aware of any threat or claim, of infringement or misappropriation of any alleged rights asserted by any Third Party in relation to the use of the Virovek Recombinant Baculoviruses or Trade Secrets;

(e) neither Virovek nor any of its Affiliates is a party to any legal action, suit or proceeding relating to the Patent Rights, Trade Secrets or the Virovek Recombinant Baculoviruses;

(f) Virovek has not received written notice concerning the institution or possible institution of any interference, reexamination, reissue, revocation or nullification proceeding involving any Patent Rights;

(g) to Virovek's knowledge, the Patent Rights in existence on the Effective Date are not invalid or unenforceable, and Virovek is not aware of any patent controlled by a Third Party with claims that dominate (in whole or in part) the claims of the Patent Rights; and

(h) during the term of this Agreement, neither Virovek nor any of its Affiliates shall enter into any agreement, or take or fail to take any action, that would restrict Virovek's legal right to grant to Celladon the rights and benefits contemplated under this Agreement.

7.3 Disclaimer. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, EACH PARTY EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF THE INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES.

7.4 Limitation of Liability. EXCEPT FOR LIABILITY FOR BREACH OF ARTICLE 5, NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT, EACH PARTY'S PERFORMANCE OR LACK OF PERFORMANCE HEREUNDER OR ANY LICENSE GRANTED HEREUNDER; *provided, however,* that this Section 7.4 shall not be construed to limit either party's indemnification obligations under Article 9.

8. TERM; TERMINATION

8.1 Term. The term of this Agreement shall commence as of the Effective Date and, unless sooner terminated as provided hereunder, shall continue until expiration of the last Royalty Term. Following the expiration of this Agreement, Celladon shall have a license on the same terms as set forth in Section 2.1, except that the license shall be fully-paid, royalty-free, irrevocable and perpetual.

8.2 Termination by Celladon. Celladon may terminate this Agreement prior to its expiration at any time, for any reason or for no reason, upon 60 days' prior written notice to Virovek.

8.3 Termination for Breach. Each party shall have the right to terminate this Agreement upon 90 days' prior written notice to the other upon or after the material breach of any material provision of this Agreement by the other party if the breaching party has not cured such breach within the 90-day period following written notice of termination by the non-breaching party.

8.4 Effect of Termination.

(a) Upon termination of this Agreement:

(i) for breach by Virovek, the license granted under Section 2.1 shall be converted to a non-exclusive, fully-paid, perpetual, irrevocable license and sublicense;

(ii) for any reason other than breach by Virovek, the license granted under Section 2.1 shall terminate and be of no further force or effect; and

(iii) any sublicenses granted under the license granted under Section 2.1 that are then in effect shall remain in full force and effect; *provided* that the sublicensee (A) is not then in material breach of its sublicense agreement and (B) agrees to be bound to Virovek as a licensor under the terms and conditions of the sublicense agreement.

(b) Within 30 days following the termination of this Agreement, each party shall return to the other party, or destroy, upon the written request of the other party, any and all Confidential Information of the other party in its possession.

(c) Expiration or termination of this Agreement shall not relieve the parties of any obligation accruing prior to such expiration or termination. The provisions of Sections 4.4, 7.3, 7.4 and 8.4 and Articles 1, 5, 6, 9, 10 and 11 shall survive any termination or expiration of this Agreement.

8.5 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by Virovek are, and will otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of right to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The parties agree that Celladon, as licensee of such rights under this Agreement, will retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code. The parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against Virovek under the U.S. Bankruptcy Code, Celladon will be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, and the same, if not already in its possession, will be promptly delivered to them (i) upon any such commencement of a bankruptcy proceeding upon its written request therefor, unless Virovek elects to continue to perform all of its obligations under this Agreement, or (ii) if not delivered under (i) above, following the rejection of this Agreement by or on behalf of Virovek upon written request therefor by Celladon.

9. INDEMNIFICATION

9.1 Indemnification by Celladon. Celladon hereby agrees to save, defend, indemnify and hold harmless Virovek, its Affiliates and their respective officers, directors, employees, consultants and agents (the ***"Virovek Indemnitees"***) from and against any and all losses, damages, liabilities, expenses and costs, including reasonable legal expense and attorneys' fees (***"Losses"***), to which Virovek may become subject as a result of any claim, demand, action or other proceeding (***"Claim"***) by any Third Party to the extent such Losses arise directly or indirectly out of (a) the gross negligence or willful misconduct of any Celladon Indemnitee (defined below), (b) the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement, or (c) the development, manufacture, use, handling, storage, sale or other disposition of Celladon In Vitro Screening Reagent, or the performance of Services, by Celladon, its Affiliates or sublicensees; in each case except to the extent such Losses result from the gross negligence or willful misconduct of any Virovek Indemnitee or the breach by Virovek of any warranty, representation, covenant or agreement made by Virovek in this Agreement.

9.2 Indemnification by Virovek. Virovek hereby agrees to save, defend, indemnify and hold harmless Celladon, its Affiliates and their respective officers, directors, employees, consultants and agents (the ***"Celladon Indemnitees"***) from and against any and all Losses to which Celladon may become subject as a result of any Claim by any Third Party to the extent such Losses arise directly or indirectly out of (a) the gross negligence or willful misconduct of any Virovek Indemnitee, or (b) the breach by Virovek of any warranty, representation, covenant or agreement made by Virovek in this Agreement, in each case except to the extent such Losses result from the gross negligence or willful misconduct of any Celladon Indemnitee or the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement.

9.3 Control of Defense. In the event a party seeks indemnification under Section 9.1 or 9.2, it shall inform the other party (the ***"Indemnifying Party"***) of a Claim as soon as reasonably practicable after it receives notice of the claim, shall permit the Indemnifying Party to assume direction and control of the defense of the claim (including the right to settle the claim solely for monetary consideration), and shall cooperate as requested (at the expense of the Indemnifying Party) in the defense of the claim.

10. DISPUTE RESOLUTION

10.1 Dispute Resolution. Any dispute arising under or relating to the parties rights and obligations under this Agreement will be referred to the Chief Executive Officers of Celladon and Virovek for resolution. In the event such officers are unable to resolve such dispute within 30 days or such dispute being referred to them, then, upon the written request of either party to the other party, the dispute shall be subject to arbitration, as provided in Section 10.2.

10.2 Arbitration.

(a) Claims. Subject to Section 10.3 below, any claim, dispute, or controversy of whatever nature arising out of or relating to this Agreement that is not resolved under Section 10.1 within the applicable 30-day time period, including, without limitation, any action or claim based on tort, contract, or statute, or concerning the interpretation, effect, termination, validity, performance and/or breach of this Agreement (***"Claim"***), shall be resolved by final and binding arbitration before a panel of three experts with relevant industry experience (the ***"Arbitrators"***). One Arbitrator shall be chosen by Celladon and one Arbitrator shall be chosen by Virovek within 15 days from the notice of initiation of arbitration. The third Arbitrator shall be chosen by mutual agreement of the Arbitrator chosen by Celladon and the Arbitrator chosen by Virovek within 15 days of the date that the last of such Arbitrators were appointed. The arbitration shall be administered by the American Arbitration Association (the ***"Administrator"***) in accordance with its then existing arbitration rules or procedures regarding commercial or business disputes. The arbitration shall be held in San Diego, California.

(b) Arbitrators' Award. The Arbitrators shall, within 15 days after the conclusion of the arbitration hearing, issue a written award and statement of decision describing the essential findings and conclusions on which the award is based, including the calculation of any damages awarded. The decision or award rendered by the Arbitrators shall be final and non-appealable, and judgment may be entered upon it in any court of competent jurisdiction. The Arbitrators shall be authorized to award compensatory damages, but shall NOT be authorized (i) to award non-economic damages, such as for emotional distress, pain and suffering or loss of consortium, (ii) to award punitive damages, or (iii) to reform or modify this Agreement or any other agreements contemplated hereunder; *provided*, *however,* that the damage limitations described in parts (i) and (ii) of this sentence will not apply if such damages are statutorily imposed.

(c) Costs. Each party shall bear its own attorneys' fees, costs, and disbursements arising out of the arbitration, and shall pay an equal share of the fees and costs of the Arbitrators; *provided*, *however,* the Arbitrators shall be authorized to determine whether a party is the prevailing party, and if so, to award to that prevailing party reimbursement for any or all of its reasonable attorneys' fees, costs and disbursements (including, for example, expert witness fees and expenses, photocopy charges, travel expenses, etc.), and/or the fees and costs of the Administrator and the Arbitrators.

(d) Compliance with this Agreement. Unless the parties otherwise agree in writing, during the period of time that any arbitration proceeding is pending under this Agreement, the parties shall continue to comply with all those terms and provisions of this Agreement that are not the subject of the pending arbitration proceeding.

10.3 Court Actions. Nothing contained in this Agreement shall deny any party the right to seek injunctive or other equitable relief from a court of competent jurisdiction in the context of a *bona fide* emergency or prospective irreparable harm, and such an action may be filed and maintained notwithstanding any ongoing arbitration proceeding. In addition, either

party may bring an action in any court of competent jurisdiction to resolve disputes pertaining to the validity, construction, scope, enforceability, infringement or other violations of patents or other proprietary or intellectual property rights, and no such dispute shall be subject to arbitration pursuant to Section 10.2.

11. General Provisions

11.1 Governing Law. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding its conflicts of laws principles.

11.2 Entire Agreement; Modification. This Agreement (including the Exhibit hereto) is both a final expression of the parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein. This Agreement may not be modified or supplemented by any purchase order, change order, acknowledgment, order acceptance, standard terms of sale, invoice or the like. This Agreement may only be modified or supplemented in a writing expressly stated for such purpose and signed by the parties to this Agreement.

11.3 Relationship Between the Parties. The parties' relationship, as established by this Agreement, is solely that of independent contractors. This Agreement does not create any partnership, joint venture or similar business relationship between the parties. Neither party is a legal representative of the other party, and neither party can assume or create any obligation, representation, warranty or guarantee, express or implied, on behalf of the other party for any purpose whatsoever.

11.4 Non-Waiver. The failure of a party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such party.

11.5 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either party without the prior written consent of the other party (which consent shall not be unreasonably withheld); *provided*, *however*, that either party may assign this Agreement and its rights and obligations hereunder without the other party's consent in connection with the transfer or sale of all or substantially all of the business of such party to which this Agreement relates to a Third Party, whether by merger, sale of stock, sale of assets or otherwise. The rights and obligations of the parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties. Any assignment not in accordance with this Agreement shall be void.

11.6 No Third Party Beneficiaries. Except as expressly set forth in Section 8.4, this Agreement is neither expressly nor impliedly made for the benefit of any party other than those executing it.

11.7 Severability. If, for any reason, any part of this Agreement is adjudicated invalid, unenforceable or illegal by a court of competent jurisdiction, such adjudication shall not affect or impair, in whole or in part, the validity, enforceability or legality of any remaining portions of this Agreement. All remaining portions shall remain in full force and effect as if the original Agreement had been executed without the invalidated, unenforceable or illegal part.

11.8 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, or by overnight courier or facsimile or electronic mail confirmed thereafter by any of the foregoing, to the party to be notified at its address given below, or at any address such party has previously designated by prior written notice to the other. Notice shall be deemed sufficiently given for all purposes upon the earlier of: (a) the date of actual receipt; (b) if mailed, three business days after the date of postmark; or (c) if delivered by overnight courier, the next business day the overnight courier regularly makes deliveries.

If to Celladon, notices must be addressed to:

Celladon Corporation
2223 Avenida de la Playa
Suite 205
La Jolla, CA 92037
Attention: Chief Executive Officer
Facsimile: (858) 964-0974

If to Virovek, notices must be addressed to:

Virovek Incorporation
3521 Investment Blvd
Suite 1
Attention: Haifeng Chen
Facsimile: 510-887-7178

11.9 Force Majeure. Each party shall be excused from liability for the failure or delay in performance of any obligation under this Agreement by reason of any event beyond such party's reasonable control, including but not limited to, Acts of God, fire, flood, explosion, earthquake, or other natural forces, war, civil unrest, accident, destruction or other casualty, any lack or failure of transportation facilities, any lack or failure of supply of raw materials, any strike or labor disturbance, or any other event similar to those enumerated above. Such excuse from liability shall be effective only to the extent and duration of the event(s) causing the failure or delay in performance and provided that the party has not caused such event(s) to occur. Notice of a party's failure or delay in performance due to force majeure must be given to the other party within 10 days after its occurrence. All delivery dates under this Agreement that

have been affected by force majeure shall be tolled for the duration of such force majeure. In no event shall any party be required to prevent or settle any labor disturbance or dispute.

11.10 Interpretation. The headings of clauses contained in this Agreement preceding the text of the articles, sections, subsections and paragraphs hereof are inserted solely for convenience and ease of reference only and shall not constitute any part of this Agreement, or have any effect on its interpretation or construction. All references in this Agreement to the singular shall include the plural where applicable, and all references to gender shall include both genders and the neuter. Unless otherwise specified, references in this Agreement to any article shall include all sections, subsections, and paragraphs in such article; references in this Agreement to any section shall include all subsections and paragraphs in such sections; and references in this Agreement to any subsection shall include all paragraphs in such subsection. All references to days in this Agreement shall mean calendar days, unless otherwise specified. Ambiguities and uncertainties in this Agreement, if any, shall not be interpreted against either party, irrespective of which party may be deemed to have caused the ambiguity or uncertainty to exist. This Agreement has been prepared in the English language and the English language shall control its interpretation. In addition, all notices required or permitted to be given hereunder, and all written, electronic, oral or other communications between the parties regarding this Agreement shall be in the English language.

11.11 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one and the same instrument.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth above.

CELLADON CORPORATION

By: /s/ Rebecque J. Laba
Name: Rebecque J. Laba
Title: V.P. Finance & Admin

VIROVEK INCORPORATION

By: /s/ Haifeng Chen
Name: Haifeng Chen
Title: CEO

EXHIBIT A

PATENT RIGHTS

Application Number	Publication Number	Title	Filing Date
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]
[…***…]	[…***…]	[…***…]	[…***…]

*****Confidential Treatment Requested**

Exhibit 10.21

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

AMENDED AND RESTATED LICENSE AGREEMENT

THIS AMENDED AND RESTATED LICENSE AGREEMENT (the "***Agreement***"), effective as of June 27, 2012 (the "***Effective Date***"), is entered into by and between **CELLADON CORPORATION**, a Delaware corporation ("***Celladon***"), with its principal place of business at 12760 High Bluff Drive, Suite 240, San Diego, CA 92130-2019, and **AMPLIPHI BIOSCIENCES CORPORATION**, formerly known as Targeted Genetics Corporation, a Washington corporation ("***AmpliPhi***"), with its principal place of business at 1100 Olive Way, Suite 100, Seattle, WA 98101.

RECITALS

WHEREAS, Celladon and AmpliPhi are parties to that certain License Agreement (the "***2009 License Agreement***") and that certain Amended and Restated Manufacturing Agreement (the "***2009 Manufacturing Agreement***"), each dated February 25, 2009 (collectively, the ***"2009 Agreements***");

WHEREAS, Celladon and AmpliPhi wish to amend and restate the 2009 License Agreement as set forth herein and terminate the 2009 Manufacturing Agreement; and

WHEREAS, Celladon and AmpliPhi intend that this Agreement supersede and replace the 2009 Agreements in their entirety, effective as of the Effective Date.

AGREEMENT

Now, **THEREFORE**, in consideration of the foregoing and the mutual promises and covenants hereinafter set forth, Celladon and AmpliPhi, intending to be legally bound, hereby agree as follows:

1. DEFINITIONS.

1.1 "**2004 Agreements**" shall mean the 2004 Collaboration Agreement and the 2004 Manufacturing Agreement.

1.2 "**2004 Collaboration Agreement**" shall mean that certain Collaboration Agreement dated December 31, 2004, as amended (which was superseded by the 2009 License Agreement).

1.3 "**2004 Manufacturing Agreement**" shall mean that certain Manufacturing Agreement dated December 31, 2004 (which was superseded by the 2009 Manufacturing Agreement).

1.4 "**AAV Vector**" shall mean an adena-associated virus gene vector composed of a viral capsid comprising three proteins known as VP1, VP2 and VP3, wherein the genome is a single-strand DNA molecule flanked by inverted terminal repeats, excluding any heterologous nonadena-associated-virus nucleic acid sequence (other than Mydicar), taken by itself, or any data, know-how, or information specific to such DNA molecule or sequence that remain the property of AmpliPhi and the use of which is subject to the provisions of confidentiality and nonuse set forth herein and in the Asset Purchase Agreement.

1.5 "**AAV Vector Manufacturing Information**" shall have the meaning provided in Section 2.2(a).

1.6 "**Active Development**" shall have the meaning provided in the UPenn Agreement.

1.7 "**Affiliate**" shall mean any company or entity controlled by, controlling, or under common control with a party hereto and shall include any company more than 50% of whose voting stock or participating profit interest is owned or controlled, directly or indirectly, by a party, and any company which owns or controls, directly or indirectly, more than 50% of the voting stock of a party.

1.8 "**AmpliPhi Licensed Patents**" shall mean all Patents that claim or cover any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), excluding any claims contained within any such Patent that do not claim or cover an AAV Vector (or the manufacture or use thereof), which Patents AmpliPhi or any of its Affiliates (except as provided in Section 9.6(a)) Controls (but does not own), as a result of being licensed to AmpliPhi by a Third Party, but excluding the AmpliPhi Owned Patents and AmpliPhi Retained Patents.

1.9 "**AmpliPhi Licensed Technology**" shall mean: (a) the AmpliPhi Licensed Patents; and (b) Information (including, without limitation, Manufacturing Information) directed to any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), which Information is Controlled (but not owned) by AmpliPhi or any of its Affiliates (except as provided in Section 9.6(a)), as a result of being licensed to AmpliPhi by a Third Party, but in any event excluding (i) AmpliPhi Owned Technology and (ii) AmpliPhi Retained Technology.

1.10 "**AmpliPhi Owned Patents**" shall mean all Patents that claim or cover any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), excluding any claims contained within any such Patent that do not claim or cover an AAV Vector (or the manufacture or use thereof), which Patents AmpliPhi or any of its Affiliates (except as provided in Section 9.6(a)) owns.

1.11 "**AmpliPhi Owned Technology**" shall mean: (a) the AmpliPhi Owned Patents; and (b) Information (including, without limitation, Manufacturing Information) directed to any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), which Information is owned by AmpliPhi or any of its Affiliates (except as provided in Section 9.6(a)), including; without limitation, all such Information that is or was conceived or developed by AmpliPhi or any of its Affiliates, in performing its obligations under the 2009 Agreements, the 2009 Letter or the 2004 Agreements, but in any event excluding (i) AmpliPhi Licensed Technology, and (ii) AmpliPhi Retained Technology.

1.12 "**AmpliPhi Retained Patents**" shall mean all Patents that claim or cover any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), which Patents were assigned to Genzyme or covered by a license or other agreement assigned to Genzyme, in each case, pursuant to the Genzyme Agreement, and AmpliPhi or any of its Affiliates (except as provided in Section 9.6(a)) Control (but do not own), but in any event excluding any claims contained within any such Patent that do not claim or cover an AAV Vector (or the manufacture or use thereof). AmpliPhi Retained Patents are listed on ***Exhibit B***.

1.13 "**AmpliPhi Retained Technology**" shall mean: (a) the AmpliPhi Retained Patents; and (b) Information and (including, without limitation, Manufacturing Information) directed to any AAV Vector or Mydicar (or the manufacture or use of either of the foregoing), which Information was assigned to Genzyme or covered by a license or other agreement assigned to Genzyme, in each case, pursuant to the Genzyme Agreement, and AmpliPhi or any of its Affiliates (except as

provided in Section 9.6(a)) Control (but do not own), including, without limitation, all such Information that is or was conceived or developed by AmpliPhi or any of its Affiliates, in performing its obligations under the 2009 Agreements, the 2009 Letter or the 2004 Agreements.

1.14 "**Asset Purchase Agreement**" shall mean that certain Asset Purchase Agreement dated as of the Effective Date between Celladon and AmpliPhi.

1.15 "**Celladon Product**" shall mean an AAV Vector-delivered product, the mechanism of action of which is modulation of macromolecules (e.g., proteins) whose role is to regulate the uptake or release of calcium in the sarcoplasmic reticulum. Celladon Products include, without limitation, Mydicar.

1.16 "**Commercially Reasonable Efforts**" means, with respect to the efforts to be expended by any entity with respect to any objective, the level of reasonable, diligent, good faith efforts and resources devoted to accomplish such objective as a typical biopharmaceutical company would normally use to accomplish a similar objective under similar circumstances.

1.17 "**Confidential Information**" shall have the meaning provided in Section 6.1.

1.18 "**Control**" shall mean, with respect to any Information, Patent or other intellectual property right, possession by a party of the right (whether by ownership, license or otherwise) to grant access, a license or a sublicense to such Information, Patent or intellectual property right without violating the terms of any agreement or other arrangement with any Third Party.

1.19 "**FDA**" shall mean the United States Food and Drug Administration, or any successor agency thereto.

1.20 "**Field**" shall mean human therapeutics and/or prophylactics.

1.21 "**First Amendment**" shall mean that certain First Amendment to Collaboration Agreement between the parties, dated June 19, 2006.

1.22 "First Amendment Arrangement" shall mean:

(a) any agreement between Celladon and any Third Party under which Celladon contracted for such Third Party to perform research using biologic materials provided to such Third Party by AmpliPhi, which agreement was entered into prior to the Effective Date pursuant to Section 2.9(b) of the 2004 Collaboration Agreement, as set forth in paragraph 1 of the First Amendment;

(b) collectively, that certain Material Transfer Agreement between AmpliPhi and the University of Pittsburgh ("***Pittsburgh***") and that certain Sponsored Research Agreement between Celladon and Pittsburgh, which agreements were entered into prior to the Effective Date pursuant to Section 2.9(c) of the 2004 Collaboration Agreement, as set forth in paragraph 1 of the First Amendment; or

(c) any agreement by and among Celladon, AmpliPhi and a Third Party (including, without limitation, Integrity Biosolution, LLC) entered into prior to the Effective Date pursuant to paragraph 2 of the First Amendment;

including, in each case, any amendment(s) to any of the foregoing, regardless of whether such amendment was entered into before or after the Effective Date.

1.23 "**Genzyme**" shall mean Genzyme Corporation, a Massachusetts corporation.

1.24 "**Genzyme Agreement**" shall mean that certain Asset Purchase Agreement between AmpliPhi and Genzyme dated September 8, 2009.

1.25 "**Information**" shall mean all tangible and intangible (a) techniques, technology, practices, trade secrets, inventions (whether patentable or not), methods, knowledge, know-how, skill, experience, test data and results (including pharmacological, toxicological and clinical test data and results), analytical and quality control data, results or descriptions, software and algorithms and (b) compositions of matter, cells, cell lines, assays, animal models and physical, biological or chemical material.

1.26 "**Knowledge**" shall mean the actual knowledge of a particular fact or other matter being possessed as of the pertinent date by the directors and officers of the applicable party.

1.27 "**Licensee**" shall mean a Third Party to whom Celladon or any of its Affiliates has directly or indirectly (*i.e.*, through the grant of a sublicense by a Third Party under a license granted to such Third Party by Celladon) granted a license or sublicense of the right to develop, make, have made, use, distribute for sale, promote, market, offer for sale, sell, have sold, import or export Celladon Products, beyond the mere right to purchase Celladon Products from Celladon or its Affiliates.

1.28 "**Manufacturing Information**" shall mean the AAV Vector Manufacturing Information and the Mydicar Manufacturing Information.

1.29 "**Manufacturing Process**" shall mean, to the extent Controlled by AmpliPhi or any of its Affiliates, the manufacturing process for the cGMP3 manufacturing campaign for Mydicar developed by AmpliPhi (then known as Targeted Genetics Corporation) pursuant to the First Amendment.

1.30 "**Mydicar**" shall mean the Celladon product known as MYDICAR® (AAV1/SERCA2a).

1.31 "**Mydicar Manufacturing Information**" shall mean, to the extent transferred or disclosed to Celladon or Celladon's designee pursuant to Section 3.1 of the 2009 Manufacturing Agreement: (a) all manufacturing and other technology and know-how necessary to practice the Manufacturing Process and to manufacture and test Mydicar pre-bulk drug substance manufactured using the Manufacturing Process; (b) the analytical methods for conformance testing of Mydicar, including all information and know-how necessary to make and use the assays that comprise such analytical methods; and (c) all pertinent manufacturing know-how, technical data, standard operating procedures, qualification documentation, engineering drawings, specifications, test data, process diagrams, information relating to sources of raw materials, analytical testing methods, protocols, process descriptions, batch records, data and other process and manufacturing data and documentation, and similar information and materials, as, in each case, are necessary to manufacture Mydicar or to support regulatory filings for Mydicar.

1.32 "**NIH Agreement**" shall mean the OTT License Agreement Number L-086-2000/0 by and between AmpliPhi (then known as Targeted Genetics Corporation) and the United States Public Health Service as represented by the Office of Technology Transfer, National Institutes of Health, dated May 21, 2004, as amended.

1.33 "**Patents**" shall mean (a) United States patents, re-examinations, reissues, renewals, extensions and term restorations, and foreign counterparts thereof, and (b) pending applications for United States patents, including, without limitation, provisional applications, continuations, continuations-in-part, divisional and substitute applications, including, without limitation, inventors' certificates, and foreign counterparts thereof.

1.34 "**Released Materials**" shall mean the Information described in ***Exhibit A*** hereto.

1.35 "**Restricted Information**" shall have the meaning provided in Section 2.2(c).

1.36 "**Sublicensee**" shall mean a Licensee to whom Celladon sublicenses any of its rights under the AmpliPhi Licensed Technology or AmpliPhi Retained Technology as permitted by this Agreement.

1.37 "**Third Party**" shall mean any entity other than Celladon or AmpliPhi or an Affiliate of Celladon or AmpliPhi.

1.38 "**UPenn**" shall mean The Trustees of the University of Pennsylvania, a Pennsylvania nonprofit corporation, with offices located at 3160 Chestnut Street, Suite 200, Philadelphia, Pennsylvania 19104-6283.

1.39 "**UPenn Agreement**" shall mean the amended and restated license agreement, dated January 29, 2009, by and between UPenn and AmpliPhi (then known as Targeted Genetics Corporation).

1.40 "**UPenn Payments**" shall mean all royalty and milestone payments due or payable by AmpliPhi to UPenn under Sections 4.1.2 and 4.3 of the UPenn Agreement as a result of Celladon's (or its Affiliate's or Licensee's) practice of the AmpliPhi Licensed Technology (including development and commercialization of Celladon Products) during the Term.

2. LICENSE.

2.1 License Grant to Celladon.

(a) License. Subject to the terms and conditions of this Agreement, AmpliPhi hereby grants to Celladon an exclusive (even as to AmpliPhi), worldwide, royalty-free, fully-paid, irrevocable, perpetual license, including the right to sublicense through multiple tiers of sublicense (subject to Section 2.l(d) below), under the AmpliPhi Licensed Technology and AmpliPhi Retained Technology to develop, make, have made, use, sell, have sold, offer for sale and import Celladon Products in the Field. For the avoidance of doubt, nothing in this Section 2.1 is intended, nor shall it be construed, to create any obligation on the part of AmpliPhi and/or its Affiliate and/or any their licensors to disclose to Celladon any AmpliPhi Licensed Technology or AmpliPhi Retained Technology not previously disclosed to Celladon or its designee.

(b) UPenn Agreement. Celladon acknowledges that the licenses granted under Section 2.l(a) with respect to the AmpliPhi Licensed Patents are subject to -and-limited by the terms and conditions of the UPenn Agreement(and the scope of rights licensed thereunder). In addition, during the term of the UPenn Agreement, Celladon shall use Commercially Reasonable Efforts to have in Active Development at least one Celladon Product that is covered by the AmpliPhi Licensed Patents owned by UPenn and licensed to AmpliPhi under the UPenn Agreement. Celladon shall comply with the applicable terms and conditions of the UPenn Agreement and take such actions as are reasonably required for AmpliPhi to comply with the UPenn Agreement with respect to Celladon's (and its Affiliates' and Licensees') development and commercialization of Celladon Products and related exercise of its licensed rights hereunder, such as, for example and without limitation, providing such information and reports as are required for AmpliPhi to meet its reporting obligations under the UPenn Agreement with respect to Celladon's (and its Affiliates' and Licensees') development and commercialization of Celladon Products. Celladon's payment obligations with respect to the UPenn Agreement are set forth in Section 3.1.

(c) Genzyme Agreement. Celladon shall comply with the applicable terms and conditions of the Genzyme Agreement and take such actions as are reasonably required for AmpliPhi to comply with the Genzyme Agreement with respect to Celladon's (and its Affiliates' and Licensees') development and commercialization of Celladon Products and related exercise of its licensed rights hereunder.

(d) Sublicensing. Celladon shall have the power to sublicense its rights to a downstream sublicensee that is an Affiliate of Celladon or to a Third Party collaborator solely for purposes of research, development or other non-commercial purposes, or as reasonably necessary, to manufacturers or distributors for the account of Celladon, but only on condition that any sublicense requires such Affiliate or Third Party collaborator to comply with the applicable terms of this Agreement and prohibits further sublicensing. Celladon shall require all Sublicensees (including, without limitation, Sublicensees who are Affiliates) to comply with the applicable terms and conditions of this Agreement (and Celladon shall remain liable for any breach by such Sublicensee of any of the terms and conditions of this Agreement). Celladon shall provide to AmpliPhi a complete and accurate copy of all agreements granting any such sublicense hereunder within 30 days after such agreement is executed, provided that Celladon may redact from such copy any proprietary or confidential information that is not necessary for AmpliPhi to ascertain Celladon's compliance with its obligations under this Agreement.

2.2 Disclosure and Use of Released Materials.

(a) Confidentiality. As between Celladon and AmpliPhi, the Released Materials shall constitute Confidential Information of AmpliPhi subject to Article 6. Without limiting Celladon's obligations to keep the Released Materials confidential in accordance with Article 6, Celladon shall treat the Released Materials and any other Confidential Information of AmpliPhi (or its Affiliates or licensors) regarding the manufacture of AAV Vectors (collectively, the "***AAV Vector Manufacturing Information***") as highly sensitive and confidential trade secrets of AmpliPhi and accordingly shall use commercially reasonable best efforts to preserve the confidentiality and prevent the unauthorized disclosure and publication thereof (using in any event no less care than Celladon would use to protect the confidentiality of its most sensitive and valuable trade secrets). Celladon shall not disclose any AAV Vector Manufacturing Information to any Third Party without AmpliPhi's prior written consent, except that Celladon shall have the right,

in its discretion and without AmpliPhi's consent, to disclose AAV Vector Manufacturing Information to:

(i) Third Parties who are manufacturing, or who are contracted to manufacture, Celladon Products on behalf of Celladon, its Affiliates or Licensees in accordance with the license granted to Celladon under Section 2.1 and the other terms and conditions of this Agreement;

(ii) Third Parties with whom Celladon is in advanced stages of negotiations for the manufacture of Celladon Products as described in the preceding clause (i); and

(iii) Third Parties conducting diligence (with a bona fide reason for doing so) with respect to Celladon Products in connection with negotiation of a proposed transaction between Celladon and any Third Party pursuant to which Celladon or its Affiliate would grant such Third Party any license or other rights to develop or commercialize Celladon Products or transfer or sell to such Third Party all or any portion of Celladon's business relating to Celladon Products, whether by merger, sale of stock, sale of assets or otherwise (a ***"Proposed Transaction"***);

in all such cases, solely to the extent such disclosure is reasonably necessary for the manufacture of Celladon Products in accordance with this Agreement or reasonably necessary for the conclusion of negotiations for a contract with such Third Party for such manufacture or the consummation of a Proposed Transaction. Any Third Party receiving a permitted disclosure of AAV Vector Manufacturing Information as provided above shall be bound in writing to obligations of non-use and confidentiality with respect to such AAV Vector Manufacturing Information to at least the same extent as provided for in this Agreement before any such disclosure is made to such Third Party. To the extent any AAV Vector Manufacturing Information falls within any exception set forth in Section 6.2, the foregoing restrictions shall not apply with respect thereto.

(b) Retained Rights to Released Materials. As between Celladon and AmpliPhi, AmpliPhi and its licensors retain ownership of, and all rights, title and interest in, to and under, the Released Materials, subject only to Celladon's right to use such Released Materials as expressly provided for herein.

(c) Restrictions on Release and Disclosure. For purposes of this Section 2.2(c), "***Restricted Information***" shall mean any of the Released Materials or Manufacturing Information that, in each case, is subject to restrictions on release or disclosure (or use inconsistent with the uses contemplated hereunder) under the Genzyme Agreement. Without limiting the generality of anything set forth in this Agreement, the Asset Purchase Agreement or the other Transaction Documents, Celladon hereby covenants that Celladon and its Affiliates shall use and disclose the Restricted Information in compliance with the provisions of Section 5.3(b) of the Genzyme Agreement. To AmpliPhi's Knowledge, ***Exhibit D*** hereto identifies all Restricted Information.

2.3 Responsibility for Celladon Product Development and Commercialization. Celladon shall be solely responsible for the worldwide development, manufacture and commercialization of Celladon Products. Celladon and its Affiliates and Licensees shall comply with all applicable laws, rules and regulations in connection with the development, manufacture, marketing, promotion and sale of Celladon Products by Celladon or any of its Affiliates or Licensees.

2.4 Regulatory Filings and Matters. AmpliPhi hereby grants Celladon the right to copy and use all information in the Biologics Master File (BMF) and other regulatory filings of AmpliPhi regarding Mydicar and/or AAV Vectors, in all such cases to the extent existing and Controlled by AmpliPhi as of the Effective Date, as necessary for Celladon to apply for, obtain, and maintain, regulatory approvals with respect to Mydicar or other Celladon Products.

3. PAYMENTS.

3.1 Reimbursement of AmpliPhi for AmpliPhi Licensed Technology. Celladon shall pay to AmpliPhi all UPenn Payments that become due and payable by AmpliPhi pursuant to the UPenn Agreement. Celladon shall make payment to AmpliPhi of such UPenn Payments at least ten (10) days before such UPenn Payments are due from AmpliPhi to UPenn, together with reasonable supporting documentation but in any event at least such documentation as required for AmpliPhi to comply with its associated reporting obligations under the UPenn Agreement. AmpliPhi and Celladon shall keep complete and accurate records pertaining to the UPenn Payments and the calculation thereof, and Celladon and AmpliPhi shall each have the right to cause an independent, certified public accountant reasonably acceptable to the other party to audit such records, in each case in accordance with Section 3.5.

3.2 No Other Payments. Section 3.1 sets forth Celladon's entire payment obligation with respect to Celladon's license to AmpliPhi Retained Technology and AmpliPhi Licensed Technology.

3.3 Exchange Rate; Manner and Place of Payment. All payments hereunder shall be payable in U.S. dollars. When conversions of payments from any foreign currency is necessary pursuant to this Agreement, such conversion shall be made using the applicable average mid-rate exchange rate for converting the applicable currency to the U.S. dollar as published by *The Wall Street Journal* on the last business day of each month during the calendar quarter for which payment is due. All payments owed under this Agreement shall be made by wire transfer in immediately available funds to a bank and account designated in writing by AmpliPhi, unless otherwise specified in writing by AmpliPhi.

3.4 Income Tax Withholding. AmpliPhi shall pay any and all taxes levied on AmpliPhi on account of any payments made to it under this Agreement. If any taxes are required to be withheld by Celladon, Celladon shall (a) deduct such taxes from the payment made to AmpliPhi, (b) timely pay the taxes to the proper taxing authority, and (c) send proof of payment to AmpliPhi and certify its receipt by the taxing authority within 30 days following such payment. Celladon shall reasonably cooperate with AmpliPhi to obtain any applicable reductions or exemptions from any such withholding taxes, if any, in accordance with applicable law.

3.5 Audits. To the extent required by the UPenn Agreement, Celladon shall keep, and shall cause its Affiliates and Licensees to keep, complete and accurate records pertaining to UPenn Payments in sufficient detail to permit AmpliPhi to confirm the accuracy of the UPenn Payments due hereunder. AmpliPhi shall have the right to cause an independent, certified public accountant selected by AmpliPhi, who does not currently provide AmpliPhi auditing services, and who is reasonably acceptable to Celladon, to audit such records to confirm UPenn Payments due hereunder for a period covering not more than the preceding three years. Such audits may be exercised during normal business hours upon reasonable prior written notice to Celladon. Prompt

adjustments shall be made by the parties to reflect the results of such audit and Celladon shall promptly remit to AmpliPhi the amount of any underpayment. AmpliPhi shall bear the full cost of such audit unless such audit discloses an underpayment by Celladon of more than 10% of the amount of payments due under this Agreement, in which case, Celladon shall bear the full cost of such audit.

4. INTELLECTUAL PROPERTY

4.1 Patent Prosecution and Maintenance.

(a) As of the Effective Date, ***Exhibit B-1*** and ***Exhibit B-2*** hereto list all AmpliPhi Licensed Patents and AmpliPhi Retained Patents, respectively.

(b) As between AmpliPhi and Celladon, AmpliPhi, or AmpliPhi's designee, shall have the first right to prepare, file, prosecute and maintain, the AmpliPhi Retained Patents (to the extent that AmpliPhi has the right to do so under the Genzyme Agreement) and the AmpliPhi Licensed Patents (to the extent that AmpliPhi has the right to do so under the UPenn Agreement); in each case, at AmpliPhi's sole expense. With respect to any AmpliPhi Retained Patents and AmpliPhi Licensed Patents, in each case, to the extent that AmpliPhi has primary prosecution and maintenance responsibility with respect thereto, AmpliPhi, upon reasonable request from Celladon from time to time, shall consult with Celladon as to the general status of the preparation, filing, prosecution and maintenance of such AmpliPhi Retained Patents or AmpliPhi Licensed Patents, as applicable.

(c) In the event that AmpliPhi elects, in any country, not to continue to prosecute and thereby to abandon an application for, or not to maintain and thereby abandon, a AmpliPhi Retained Patent or AmpliPhi Licensed Patent (excluding any such abandonment with respect to a patent application where the subject matter of the applicable patent application is the subject, or still eligible to be the subject, of another patent application in the country where such patent application is being abandoned; and, in any event, to the extent that AmpliPhi has primary prosecution and maintenance responsibility with respect to such AmpliPhi Retained Patent or AmpliPhi Licensed Patent, as applicable), then AmpliPhi shall notify Celladon not less than 60 days before the next deadline for any action that may be taken with respect to such AmpliPhi Retained Patent or AmpliPhi Licensed Patent with the U.S. Patent & Trademark Office or any foreign patent office. At Celladon's request, AmpliPhi and Celladon shall discuss in good faith the potential assumption by Celladon of responsibility for such AmpliPhi Retained Patent or AmpliPhi Licensed Patent, as applicable, at Celladon's cost and expense (if such assumption of responsibility is possible considering other AmpliPhi licensees or sublicensees of such AmpliPhi Retained Patent or AmpliPhi Licensed Patent and to the extent permitted by the Genzyme Agreement or UPenn Agreement, as applicable).

4.2 Cooperation of the Parties. Each party agrees to cooperate fully in the preparation, filing, prosecution and maintenance of any AmpliPhi Retained Patents and AmpliPhi Licensed Patent under this Agreement and in the obtaining and maintenance of any patent extensions, supplementary protection certificates and the like with respect to any AmpliPhi Retained Patent and AmpliPhi Licensed Patent (solely to the extent permitted in the Genzyme Agreement or UPenn Agreement, as applicable) claiming a Celladon Product being developed or commercialized by or on behalf of Celladon in accordance with this Agreement. Such cooperation

includes, but is not limited to promptly informing the other party of any matters coming to such party's attention that may affect the preparation, filing, prosecution or maintenance of any such AmpliPhi Retained Patent or AmpliPhi Licensed Patent. AmpliPhi agrees that it shall not seek any patent term extension or restoration based upon the regulatory review and approval of a Celladon Product in any market or country without the prior written approval by Celladon.

4.3 Patent Enforcement. If a party becomes aware of any Third Party's manufacture, use, sale, offer for sale or import of a product that is competitive with a Celladon Product and such party believes or suspects that such Third Party's activities infringe, or may infringe, any AmpliPhi Retained Patent or AmpliPhi Licensed Patent, including the filing by any Third Party of any certification filed under the United States Drug Price Competition and Patent Term Restoration Act of 1984, such party shall promptly notify the other party in writing thereof, including the identity of such Third Party, which notice shall set forth in reasonable detail the facts and circumstances of such activities that are known to such party. To the maximum extent permitted by the UPenn Agreement, Celladon, at its sole expense, shall have the right to determine the appropriate course of action to enforce AmpliPhi Licensed Patents or otherwise abate the infringement thereof, to take (or refrain from taking) appropriate action to enforce AmpliPhi Licensed Patents, to defend any declaratory judgments seeking to invalidate or hold the AmpliPhi Licensed Patents unenforceable, to control any litigation or other enforcement action and to enter into, or permit, the settlement of any such litigation, declaratory judgments or other enforcement action with respect to AmpliPhi Licensed Patents, in each case in Celladon's own name and, if necessary for standing purposes, in the name of AmpliPhi and shall consider, in good faith, the interests of AmpliPhi in so doing. If Celladon does not, within one hundred twenty (120) days of receipt of notice from AmpliPhi, abate the infringement or file suit to enforce the AmpliPhi Licensed Patents, AmpliPhi shall have the right to take whatever action it deems appropriate to enforce the AmpliPhi Licensed Patents. The party controlling any such enforcement action shall not settle the action or otherwise consent to an adverse judgment in such action that diminishes the rights or interests of the non-controlling party without the prior written consent of the other party. All monies recovered upon the final judgment or settlement of any such suit to enforce the AmpliPhi Licensed Patents shall first be applied to reimburse each party, and, if applicable, UPenn, for their respective litigation expenditures, with remaining recoveries being subject to Celladon's payment obligations under Section 3.1 to the extent required by the UPenn Agreement, after which any remaining recovery shall be shared by the parties in relation to the damages suffered by each party.

4.4 Third Party Infringement Claims. AmpliPhi shall not have the right to settle any infringement claim or action by a Third Party alleging that the manufacture, use or sale of a Celladon Product infringes the Patents of a Third Party, without the prior written consent of Celladon. Such consent shall not be unreasonably withheld or delayed, but may be withheld if such settlement would materially and adversely affect Celladon's interests.

(a) Celladon's Right to Defend. Celladon shall have the sole right to control any defense of any such claim involving alleged infringement of Third Party Patents by Celladon's activities at its own expense and by counsel of its own choice, and AmpliPhi shall have the right, at its own expense, to be represented in any such action by counsel of its own choice.

(b) AmpliPhi's Right to Defend. AmpliPhi shall have the sole right to control any defense of any such claim involving alleged infringement of Third Party rights by AmpliPhi's activities at its own expense and by counsel of its own choice, and Celladon shall have the right, at

its own expense, to be represented in any such action by counsel of its own choice, to the extent AmpliPhi is not contractually restricted from allowing Celladon to do so.

Nothing in this Section 4.4 shall require either party to conduct patent searches or otherwise seek to determine the existence of any such infringement.

4.5 Acknowledgment. AmpliPhi acknowledges that the patent applications listed on **Exhibit C** hereto (including foreign counterparts thereof and any patents issuing thereon) are not owned by AmpliPhi.

5. REPRESENTATIONS, WARRANTIES AND COVENANTS

5.1 Mutual Representations and Warranties. Each party represents and warrants to the other that: (a) it is duly organized and validly existing under the laws of its jurisdiction of incorporation or formation, and has full corporate or other power and authority to enter into this Agreement and to carry out the provisions hereof; (b) it is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder, and the person or persons executing this Agreement on its behalf has been duly authorized to do so by all requisite corporate or partnership action; and (c) this Agreement is legally binding upon it, enforceable in accordance with its terms, and does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any material law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it.

5.2 AmpliPhi Representations and Warranties.

(a) AmpliPhi represents and warrants to Celladon that, as of the Effective Date:

(i) there are no pending legal actions of which AmpliPhi has received written notice or judgments or settlements of legal actions against or owed by AmpliPhi with respect to the AmpliPhi Retained Technology or AmpliPhi Licensed Technology and AmpliPhi has not received written notice of any pending or threatened claims or litigation seeking to invalidate any AmpliPhi Retained Patents or AmpliPhi Licensed Patents, or claiming misappropriation by AmpliPhi of other intellectual property rights in the AmpliPhi Retained Technology or AmpliPhi Licensed Technology;

(ii) to AmpliPhi's Knowledge, ***Exhibit B-1*** and ***Exhibit B-2*** hereto are a true and complete lists of AmpliPhi Licensed Patents and AmpliPhi Retained Patents (excluding, for the avoidance of doubt, any Patents under the NIH Agreement), respectively, that, in each case, exist on the Effective Date and would, in the absence of the license granted under Section 2.l(a), be infringed by the manufacture, use, sale or import of Mydicar, in its current form; and

(iii) AmpliPhi has not received written notice concerning the institution or possible institution of any interference, reexamination, reissue, revocation or nullification involving any AmpliPhi Retained Patent or AmpliPhi Licensed Patent.

(b) AmpliPhi additionally represents and warrants to Celladon that, as of the Effective Date, the Genzyme Agreement is in full force and effect.

(c) AmpliPhi additionally represents and warrants to Celladon that, as of the Effective Date:

(i) The UPenn Agreement is valid, binding and in full force and effect and enforceable by AmpliPhi in accordance with its terms, except as enforcement may be limited by general equitable principles and the exercise of judicial discretion in accordance with such principles;

(ii) The consummation of the transactions contemplated by this Agreement will not, to the Knowledge of AmpliPhi, result in a breach of the UPenn Agreement;

(iii) There exists no default or event of default or event, occurrence, condition or act, with respect to AmpliPhi, or to AmpliPhi's Knowledge, with respect to the other contracting party, which, with the giving of notice, the lapse of the time or the happening of any other event or conditions, would become a default or event of default under the UPenn Agreement. AmpliPhi has not received written or oral notice of, and has no Knowledge of any (A) actual, alleged, possible or potential violation or breach of, or default under, the UPenn Agreement, or (B) intent to effect, the cancellation, modification or termination of the UPenn Agreement;

(iv) A true, correct and complete copy of the UPenn Agreement has been made available to Celladon; and

(v) There are no outstanding amounts or fees due and payable by AmpliPhi to UPenn under Sections 4.2.6 or 7.1 of the UPenn Agreement.

5.3 Covenant Regarding Genzyme Agreement. AmpliPhi hereby covenants that AmpliPhi will:

(a) comply with all terms and conditions of the Genzyme Agreement relating to AmpliPhi's retained rights to the AmpliPhi Retained Technology;

(b) not voluntarily terminate the Genzyme Agreement or any of AmpliPhi's retained rights to the AmpliPhi Retained Technology thereunder without Celladon's prior written consent; and

(c) not: (i) amend the Genzyme Agreement in any way that would limit, modify or restrict Celladon's rights and licenses hereunder or increase or modify Celladon's obligations hereunder, without Celladon's prior written consent; and (ii) waive any of AmpliPhi's rights under the Genzyme Agreement in a manner that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent. Without limiting the generality of the foregoing, AmpliPhi shall not consent or agree (by amendment, waiver, or other action of similar legal effect) to any limitation or narrowing of the scope of AmpliPhi's retained rights (as they exist on the Effective Date) to any AmpliPhi Retained Technology under the Genzyme Agreement that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent.

5.4 Covenant Regarding UPenn Agreement. AmpliPhi hereby covenants that AmpliPhi will:

(a) comply with all terms and conditions of the UPenn Agreement relating to AmpliPhi's rights to the AmpliPhi Licensed Technology;

(b) not voluntarily terminate the UPenn Agreement or any of AmpliPhi's rights to the AmpliPhi Licensed Technology thereunder without Celladon's prior written consent; and

(c) not: (i) amend the UPenn Agreement in any way that would limit, modify or restrict Celladon's rights and licenses hereunder or increase or modify Celladon's obligations hereunder, without Celladon's prior written consent; and (ii) waive any of AmpliPhi's rights under the UPenn Agreement in a manner that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent. Without limiting the generality of the foregoing, AmpliPhi shall not consent or agree (by amendment, waiver, or other action of similar legal effect) to any limitation or narrowing of the scope of AmpliPhi's rights (as they exist on the Effective Date) to any AmpliPhi Licensed Technology under the UPenn Agreement that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent.

5.5 Disclaimer of Warranties. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, ALL TECHNOLOGY, MATERIALS, INTELLECTUAL PROPERTY AND OTHER SUBJECT OF THIS AGREEMENT ARE PROVIDED "AS IS" AND THE PARTIES EXPRESSLY DISCLAIM ANY AND ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF DESIGN, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON INFRINGEMENT, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES, IN ALL CASES WITH RESPECT THERETO. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, ALL REPRESENTATIONS AND WARRANTIES, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED.

5.6 Limitation of Liability. NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT OR THE LICENSE GRANTED HEREUNDER; *provided*, *however*, that this Section 5.6 shall not be construed to limit either party's indemnification obligations under Article 7 and this Section 5.6 shall not apply to a breach of Section 2.2(a) or Article 6 hereunder.

6. CONFIDENTIALITY

6.1 Confidential Information. Except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the parties, the parties agree that the receiving party shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as expressly provided for in this Agreement any Information furnished to it by the other party pursuant to this Agreement, the 2009 Agreements, the 2009 Letter or the 2004 Agreements, or any Information developed pursuant to this Agreement, the 2009 Agreements, the 2009 Letter or the 2004 Agreements (collectively, "***Confidential Information***"). Each party may use such Confidential Information only to the extent expressly provided for in this Agreement. Each party will use at least the same standard of care as it uses to protect proprietary or confidential information of its own (which shall in any event shall at least be reasonable care) to ensure that its

employees, agents, consultants and other representatives do not disclose or make any unauthorized use of the Confidential Information. Each party will promptly notify the other upon discovery of any unauthorized use or disclosure of the Confidential Information.

6.2 Exceptions. Confidential Information shall not include any information which the receiving party can prove by competent evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the receiving party, generally known or available to the public; (b) is known by the receiving party at the time of receiving such information, as evidenced by its records; (c) is hereafter furnished to the receiving party by a Third Party, as a matter of right and without restriction on disclosure; (d) is independently discovered or developed by the receiving party without the use of or reference to Confidential Information belonging to the disclosing party, as evidenced by its written records; or (e) is the subject of a written permission to disclose provided by the disclosing party.

6.3 Authorized Disclosure. Each party may disclose Confidential Information belonging to the other party as expressly permitted in Section 2.2 or if and to the extent such disclosure is reasonably necessary in the following instances (but further subject to the limitations and restrictions in Section 2.2(a) with respect to any AAV Vector Manufacturing Information):

(a) filing or prosecuting Patents as permitted by this Agreement;

(b) regulatory filings for Celladon Products as permitted by this Agreement;

(c) prosecuting or defending litigation as permitted by this Agreement;

(d) complying with applicable court orders or governmental regulations;

(e) disclosure to Third Parties in connection with due diligence investigations by such Third Parties, and disclosure to potential Third Party investors in confidential financing documents, provided, in each case, that any such Third Party agrees to be bound by reasonable terms of confidentiality and non-use, but in any event excluding any right to further disclose any Confidential Information to Third Parties (it being understood that any such disclosure of AAV Vector Manufacturing Information shall be subject to the additional limitations and restrictions set forth in Section 2.2(a)); and

(f) disclosure to Affiliates, Licensees, employees and consultants of the recetvmg party, solely to the extent required to conduct development, manufacturing and/or commercialization activities in accordance with the license granted under Section 2.1, in each case on the condition that such Affiliate, Licensee, employee or consultant agrees to be bound by terms of confidentiality and non-use at least equivalent in scope to those set forth in this Article 6 (excluding, without the written consent of both AmpliPhi and Celladon, the permission contained in this Section 6.3 permitting further disclosure to subsequent Third Parties).

In the event Celladon is required to make a disclosure of AmpliPhi's Confidential Information pursuant to Section 6.3(b), then, to the extent practicable under the circumstances and customary in the pharmaceutical industry for regulatory filings, Celladon shall use Commercially Reasonable Efforts to avoid unnecessary public disclosure of AmpliPhi's Confidential Information. Notwithstanding the foregoing in this Section 6.3, in the event a party is required to make a disclosure of the other party's Confidential Information pursuant to Section 6.3(c) or 6.3(d), it will, except where impracticable, give reasonable advance notice to the other party of such disclosure and use efforts to

secure confidential treatment of such information at least as diligent as such party would use to protect its own confidential information, but in no event less than reasonable efforts. In any event, the parties agree to take all reasonable action to avoid disclosure of Confidential Information hereunder. The terms and conditions of this Agreement shall be Confidential Information of both parties hereunder and disclosure thereof by either party shall be subject to the limitations on disclosure set forth herein. The parties will consult with each other on the provisions of this Agreement to be redacted in any filings made by the parties with the Securities and Exchange Commission or as otherwise required by law.

6.4 Publications. AmpliPhi shall not have the right to make any publication (including any oral presentation and abstract) regarding Celladon Products being developed or commercialized hereunder without Celladon's prior written consent, which may be withheld in Celladon's sole discretion (it being understood that the foregoing shall not limit AmpliPhi's ability to make any publication regarding AAV Vectors outside the context of Celladon Products). AmpliPhi recognizes that the publication by or on behalf of Celladon, its Affiliates and Licensees of papers regarding Celladon Products, including oral presentations and abstracts, may be beneficial to both parties provided such publications are subject to reasonable controls to protect AmpliPhi's Confidential Information. Accordingly, AmpliPhi shall have the right to review and comment on any material proposed for disclosure or publication by Celladon, such as by oral presentation, manuscript or abstract, which includes AmpliPhi's Confidential Information. Before any such material is submitted for publication, Celladon shall deliver a complete copy to AmpliPhi at least 45 days prior to submitting the material to a publisher or initiating any other disclosure. AmpliPhi shall review any such material and recommend any changes it reasonably believes are necessary to preserve Confidential Information to Celladon within 30 days of the delivery of such material to AmpliPhi, and Celladon shall comply with any request to remove or delete Confidential Information disclosed by AmpliPhi. With respect to oral presentation materials and abstracts, Celladon shall make reasonable efforts to expedite review of such materials and abstracts, and shall return such items as soon as practicable to Celladon with appropriate comments, if any, but in no event later than 30 days from the date of delivery to AmpliPhi. Celladon shall comply with AmpliPhi's request to delete AmpliPhi's Confidential Information in any such material and agrees to delay any submission for publication or other public disclosure for a period of up to an additional 60 days for the purpose of preparing and filing appropriate patent applications.

6.5 Publicity. It is understood that each party may desire or be required to issue press releases relating to this Agreement or activities thereunder. The parties agree to consult with each other reasonably and in good faith with respect to the text and timing of such press releases prior to the issuance thereof, provided that a party may not unreasonably withhold or delay consent to such releases, and that either party may issue such press releases as it determines, based on advice of counsel, are reasonably necessary to comply with laws or regulations or for appropriate market disclosure. In addition, either party shall be free to disclose, without the other party's prior written consent, the existence of this Agreement, the identity of the other party and those terms of the Agreement which have already been publicly disclosed in accordance herewith.

6.6 Retroactive Effect. The provisions of Sections 6.1 thought 6.3 shall be deemed to apply retroactively so that any Confidential Information of a party disclosed or used in violation of such Sections prior to the Effective Date shall be subject to enforcement and remedies under this Agreement as if such violation occurred after the Effective Date.

7. INDEMNIFICATION

7.1 Indemnification by AmpliPhi. AmpliPhi hereby agrees to save, defend and hold Celladon and its Affiliates and their respective directors, officers, employees and agents (each, a "***Celladon Indemnitee***") harmless from and against any and all liabilities, expenses, damages and/or loss, including reasonable legal expense and attorneys' fees (collectively, "***Losses***"), to which any Celladon Indemnitee may become subject as a result of any claim, suit, demand, action or other proceeding by any Third Party (each a "***Claim***") to the extent arising directly or indirectly out of: (i) the breach by AmpliPhi of any warranty, representation, covenant or agreement made by AmpliPhi in this Agreement; or (ii) the gross negligence or willful misconduct of any AmpliPhi Indemnitee (defined below); except, in each case, to the extent such Losses result from the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement or the gross negligence or willful misconduct of any Celladon Indemnitee.

7.2 Indemnification by Celladon. Celladon hereby agrees to save, defend and hold AmpliPhi and its Affiliates and their respective directors, officers, employees and agents (each, a "***AmpliPhi Indemnitee***") harmless from and against any and all Losses to which any AmpliPhi Indemnitee may become subject as a result of any Claim to the extent arising directly or indirectly out of: (i) the development, manufacture, use, handling, storage, sale, promotion, marketing or other disposition of any Celladon Product by Celladon or any of its Affiliates and Licensees, including, without limitation, clinical trials in connection therewith, (ii) the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement; or (iii) the gross negligence or willful misconduct of any Celladon Indemnitee; except, in each case, to the extent such Losses result from the breach by AmpliPhi of any warranty, representation, covenant or agreement made by AmpliPhi in this Agreement or the gross negligence or willful misconduct of any AmpliPhi Indemnitee.

7.3 Control of Defense. Any entity entitled to indemnification under this Article 7 shall give notice to the indemnifying party of any Claim that may be subject to indemnification hereunder, promptly after learning of such Claim, and the indemnifying party shall assume (and have the right to control) the defense of such Claim with counsel reasonably satisfactory to the indemnified party. If such defense is assumed by the indemnifying party with counsel so selected, the indemnifying party will not be subject to any liability for any settlement of such Losses made by the indemnified party without the indemnifying party's consent (but such consent will not be unreasonably withheld or delayed), and will not be obligated to pay the fees and expenses of any separate counsel retained by the indemnified party with respect to such Losses. The indemnifying patty shall not settle any Claim other than solely for the payment of money by such indemnifying party without the indemnified party's consent, such consent not to be unreasonably delayed or withheld. The indemnified party shall have the right to participate, at its own expense and with counsel of its choice, in the defense of any Claim defended by the indemnifying party. The indemnified party shall reasonably cooperate with the indemnifying party with respect to the defense of any Claim.

8. DISPUTE RESOLUTION

8.1 Dispute Resolution. In the event of any dispute arising out of or relating to this Agreement, the parties shall, through their respective Chief Executive Officers, first meet and attempt to resolve the dispute in face-to-face negotiations. This meeting shall occur within 15 days

after either party provides notice to the other party that it wishes to invoke such negotiations. If the parties are unable to resolve such dispute through such negotiations within such 15 day period, then, except in the case of a dispute, controversy or claim that concerns (a) the validity or infringement of a patent, trademark or copyright (unless concerning the payment of royalties hereunder) or (b) any antitrust, anti-monopoly or competition law or regulation, whether or not statutory, the dispute, controversy or claim shall be resolved exclusively by binding arbitration before a single independent and neutral experienced arbitrator selected by mutual agreement of the parties. In the event that the parties are unable to mutually agree on the appointment of such arbitrator, then such arbitration shall be conducted before a panel of three independent and neutral experienced arbitrators, one chosen by AmpliPhi, one chosen by Celladon and the third chosen by the foregoing two arbitrators. Any such arbitration proceeding shall be administered by the American Arbitration Association, with limited discovery, in accordance with its then current rules of the American Arbitration Association governing commercial disputes. The place of arbitration shall be San Francisco, California. The arbitrator(s) shall have no authority to award punitive or similar damages. Except to the extent necessary to confirm an award or as may be required by law, neither a party nor any arbitrator may disclose the existence, content, or results of an arbitration without the prior written consent of both parties. In no event shall an arbitration be initiated after the date when commencement of a legal or equitable proceeding based on the dispute, controversy or claim would be barred by the applicable California statute of limitations. Each party shall bear its own attorneys' fees, costs and disbursements alising out of the arbitration, and shall pay an equal share of the fees and costs of the arbitrators; provided, however, that the arbitrators shall be authorized to determine whether a party is the prevailing party, and if so, to award to that prevailing party reimbursement for its reasonable attorneys' fees, costs and disbursements (including, for example, expert witness fees and expenses, photocopy charges, travel expenses, etc.) and/or the fees and costs of the arbitrators. Each party shall fully perform and satisfy the arbitration award within 15 days of the service of the award and such award can be entered into and enforced by any court of competent jurisdiction. By agreeing to this binding arbitration provision, the parties understand that they are waiving certain tights and protections which may otherwise be available if a dispute between the parties were determined by litigation in court, including, without limitation, the tight to seek or obtain certain types of damages precluded by this provision, the right to a jury trial, certain lights of appeal and a light to invoke formal rules of procedure and evidence.

8.2 Injunctive Relief. Notwithstanding the provisions of Section 8.1, each party acknowledges and agrees that, due to the unique and valuable nature of the other party's proprietary information and materials, there can be no adequate remedy at law for any breach by such party of the provisions of this Agreement, that any such breach may result in irreparable harm to the other party for which monetary damages would be inadequate to compensate such party and that the other party shall have the right, in addition to any other lights available under applicable law, to obtain from any court of competent jurisdiction injunctive relief to restrain any breach or threatened breach of, or otherwise to specifically enforce, any covenant or obligation of such party under such provisions, without the necessity of posting any bond or security.

9. GENERAL PROVISIONS

9.1 Rights in Bankruptcy. All rights and licenses granted to either party under or pursuant to this Agreement are, and will otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of light to "intellectual property" as defined under

Section 101 of the U.S. Bankruptcy Code. The parties agree that Celladon, as licensee of such rights under this Agreement; will retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code. The parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against AmpliPhi under the U.S. Bankruptcy Code, Celladon will be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, and same, if not already in its possession, will be promptly delivered to it (i) upon any such commencement of a bankruptcy proceeding upon its written request therefor, unless AmpliPhi elects to continue to perform all of its obligations under this Agreement, or (ii) if not delivered under (i) above, following the rejection of this Agreement by or on behalf of AmpliPhi upon written request therefor by Celladon.

9.2 Governing Law. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding its conflicts of laws principles.

9.3 Entire Agreement; Modification. This Agreement, together with the Asset Purchase Agreement and the other Transaction Documents (as defined in the Asset Purchase Agreement), is both a final expression of the parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement, together with the Asset Purchase Agreement and the other Transaction Documents, supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein, including, without limitation, the 2009 Agreements, the 2009 Letter and the 2004 Agreements (except for those provisions of the 2004 Collaboration Agreement and First Amendment expressly referenced herein with respect to the application of Section 1.22). No rights or licenses with respect to any intellectual property of either party are granted or deemed granted hereunder or in connection herewith (by implication or otherwise), other than those rights expressly granted in this Agreement. Without limiting the foregoing, AmpliPhi retains all its rights under the AmpliPhi Retained Technology, AmpliPhi Licensed Technology and AmpliPhi Owned Technology with respect to any products that are not Celladon Products. This Agreement may only be modified or supplemented in a writing expressly stated for such purpose and signed by the parties to this Agreement.

9.4 Relationship Between the Parties. The parties' relationship, as established by this Agreement, is solely that of independent contractors. This Agreement does not create any partnership, joint venture or similar business relationship between the parties. Neither party is a legal representative of the other party, and neither party can assume or create any obligation, representation, warranty or guarantee, express or implied, on behalf of the other party for any purpose whatsoever.

9.5 Non-Waiver. The failure of a party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such party.

9.6 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either party

without the prior written consent of the other party (which consent shall not be unreasonably withheld or delayed); *provided*; *however*, that either party may assign this Agreement and its rights and obligations hereunder without the other party's consent:

(a) in connection with the transfer or sale of such party or all or substantially all of the business of such party to which this Agreement relates to a Third Party, whether by merger, sale of stock, sale of assets or otherwise, provided that in the event of such a transaction (whether this Agreement is actually assigned or is assumed by the acquiring party by operation of law (*e.g.*, in the context of a reverse triangular merger)), intellectual property rights and technology of the acquiring party to such transaction (if other than one of the parties to this Agreement immediately prior to such transaction) shall not be included in the intellectual property and technology licensed hereunder, except to the extent already included in licenses granted hereunder prior to the consummation of such transaction; or

(b) to an Affiliate, provided that the assigning party shall remain bound by the terms and conditions of this Agreement and shall remain liable and responsible to the non-assigning party hereto for the performance and observance of all such duties and obligations by such Affiliate.

The rights and obligations of the parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties. Any assignment not in accordance with this Agreement shall be void.

9.7 No Third Party Beneficiaries. This Agreement is neither expressly nor impliedly made for the benefit of any party other than Celladon and AmpliPhi and their respective successors and permitted assigns. For the avoidance of doubt, although each party has direct obligations to the other party with respect to the Genzyme Agreement and the UPenn Agreement, neither Genzyme, nor UPenn is intended, nor shall either of them be construed, to be a third party beneficiary of this Agreement.

9.8 Severability. If, for any reason, any part of this Agreement is adjudicated invalid, unenforceable or illegal by a court of competent jurisdiction, such adjudication shall not affect or impair, in whole or in part, the validity, enforceability or legality of any remaining portions of this Agreement. All remaining portions shall remain in full force and effect as if the original Agreement had been executed without the invalidated, unenforceable or illegal part.

9.9 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, or by overnight courier or facsimile confirmed thereafter by any of the foregoing, to the party to be notified at its address(es) given below, or at any address such party has previously designated by prior written notice to the other. Notice shall be deemed sufficiently given for all purposes upon the earliest of: (a) the date of actual receipt; (b) if mailed, three days after the date of postmark; or (c) if delivered by overnight courier, the next business day the overnight courier regularly makes deliveries.

If to Celladon, notices must be addressed to:

Celladon Corporation
12760 High Bluff Drive
Suite 240
San Diego, CA 92130
Attention: Chief Executive Officer
Facsimile: (858) 964-0974

If to AmpliPhi, notices must be addressed to:

AmpliPhi Biosciences Corporation
1100 Olive Way
Suite 100
Seattle, WA 98101
Attention: Philip J. Young

9.10 Force Majeure. Except for the obligation to make payment when due, each party shall be excused from liability for the failure or delay in performance of any obligation under this Agreement by reason of any event beyond such party's reasonable control including but not limited to Acts of God, fire, flood, explosion, earthquake, or other natural forces, war, civil unrest, accident, destruction or other casualty, any lack or failure of transportation facilities, any lack or failure of supply of raw materials, any strike or labor disturbance, or any other event similar to those enumerated above. Such excuse from liability shall be effective only to the extent and duration of the event(s) causing the failure or delay in performance and provided that the party has not caused such event(s) to occur. Notice of a party's failure or delay in performance due to force majeure must be given to the other party within 10 days after its occurrence. All delivery dates under this Agreement that have been affected by force majeure shall be tolled for the duration of such force majeure. In no event shall any party be required to prevent or settle any labor disturbance or dispute.

9.11 Interpretation.

(a) Captions & Headings. The captions and headings of clauses contained in this Agreement preceding the text of the articles, sections, subsections and paragraphs hereof are inserted solely for convenience and ease of reference only and shall not constitute any part of this Agreement, or have any effect on its interpretation or construction.

(b) Singular & Plural. All references in this Agreement to the singular shall include the plural where applicable, and all references to gender shall include both genders and the neuter.

(c) Articles, Sections & Subsections. Unless otherwise specified, references in this Agreement to any article shall include all sections, subsections, and paragraphs in such article; references in this Agreement to any section shall include all subsections and paragraphs in such sections; and references in this Agreement to any subsection shall include all paragraphs in such subsection.

(d) Days. All references to days in this Agreement shall mean calendar days, unless otherwise specified.

(e) Ambiguities. Ambiguities and uncertainties in this Agreement, if any, shall not be interpreted against either party, irrespective of which party may be deemed to have caused the ambiguity or uncertainty to exist.

9.12 Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument.

[Remainder of this page intentionally left blank.]

IN WITNESS WHEREOF, the parties have duly executed this Amended and Restated License, Agreement as of the Effective Date.

CELLADON CORPORATION

By: /s/ Krisztina M. Zsebo
Krisztina M. Zsebo
Chief Executive Officer

AMPLIPHI BIOSCIENCES CORPORATION

By: /s/ Philip J. Young
Philip J. Young
President and CEO

Exhibit A

Released Materials

All Information, documents and biological materials disclosed and released to Celladon by or on behalf of AmpliPhi pursuant to the Asset Purchase Agreement and Sections 2.2(a), 2.2(b) and 2.2(c) of the 2009 License Agreement, including, without limitation, the following:

- All "Deposit Material," as such term is defined in that certain Three-Party Escrow Service Agreement among Celladon, AmpliPhi and Iron Mountain Intellectual Property Management, Inc., dated September 15, 2006 (the "***Iron Mountain Agreement***").
- All "Escrow Material," as such term is defined in that certain Escrow Agreement among Celladon, AmpliPhi and Fisher BioServices, Inc., dated August 6, 2008 (the "***Fisher Agreement***").
- AmpliPhi manufactured or non-commercially available cell lines, standards, and reagents used for QC and characterization tests, subject to third party restrictions which will be evaluated on a case by case basis. AmpliPhi and Celladon shall cooperate in seeking any third party permissions necessary to transfer materials necessary to Celladon or to provide Celladon with access directly to such third parties.
- Draft development reports on 250L process and executed batch records from the engineering run performed in November 2008.
- All "Additional Deposit Materials," as defined in Exhibit E to the Iron Mountain Agreement, in AmpliPhi's possession as of February 25, 2009, except to the extent such Additional Deposit Materials were included in the Deposit Materials released to Celladon by Iron Mountain pursuant to the 2009 License Agreement.
- All "Additional Escrow Materials" and "Timed Escrow Materials," as defined in Part B and Part C, respectively, of Schedule 2 to the Fisher Agreement, in AmpliPhi's possession as of February 25, 2009, except to the extent such Additional Escrow Materials or Timed Escrow Materials were included in the Escrow Materials released to Celladon by Fisher pursuant to the 2009 License Agreement.

Exhibit B-1

AmpliPhi Licensed Patents

See attached list.

Penn Docket Number	Targeted Docket Number	Attorney File Number	Brief Title	Patent Numbers and Dates
[…***…]	[…***…]	[…***…]	[…***…]	[…***…]

*****Confidential Treatment Requested**

Exhibit B-2

AmpliPhi Retained Patents

#	Country	Title	App# File Date	Patent# Grant Date	Parent# File Date	Type	Inventors	Owner	Status
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]		[...***...]	[...***...]	[...***...]	[...***...]
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*****Confidential Treatment Requested**

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*****Confidential Treatment Requested**

#	Country	Title	App# File Date	Patent# Grant Date	Parent# File Date	Type	Inventors	Owner	Status
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[...***...]	[...***...]	[...***...]			[...***...]	[...***...]	[...***...]	[...***...]	[...***...]

*****Confidential Treatment Requested**

Exhibit C

Patents Not Owned by AmpliPhi Under First Amendment

1. [...***...]
2. [...***...]
3. [...***...]

*****Confidential Treatment Requested**

Exhibit D

Released Materials Subject to Restrictions on Release of Disclosure

Material	SOP	Use	Lot
[...***...]	[...***...]	[...***...]	[...***...]
[...***...]	[...***...]	[...***...]	
[...***...]	[...***...]	[...***...]	[...***...]
[...***...]		[...***...]	
[...***...]	[...***...]	[...***...]	[...***...]

Materials Obtained from ATCC

[...***...]

Reports, Documents, and Assays Subject to Third Party Restrictions

- Certain Information Contained in Iron Mountain Specification Updates designated with the prefix “SP-” which include, but are not limited to:
  - [...***...]

Exhibit 10.22

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

SUBLICENSE AGREEMENT

THIS SUBLICENSE AGREEMENT (the ***"Agreement"***), effective as of June 27, 2012 (the ***"Effective Date"***), is entered into by and between **CELLADON CORPORATION**, a Delaware corporation (***"Celladon"***), with its principal place of business at 12760 High Bluff Drive, Suite 240, San Diego, CA 92130-2019, and **AMPLIPHI BIOSCIENCES CORPORATION**, a Washington corporation (***"AmpliPhi"***), with its principal place of business at 1100 Olive Way, Suite 100, Seattle, WA 98101.

RECITALS

WHEREAS, The Trustees of the University of Pennsylvania, a Pennsylvania nonprofit corporation (***"Penn"***), and AmpliPhi are parties to that certain Amended and Restated License Agreement, dated January 29, 2009 (the ***"Penn Agreement"***), pursuant to which, among other things, Penn granted AmpliPhi a license under the Group 2 Patents (as defined in the Penn Agreement) on the terms and conditions set forth therein; and

WHEREAS, Celladon wishes to obtain, and AmpliPhi is willing to grant to Celladon, a sublicense under the Group 2 Patents for the purpose of developing and commercializing a Companion Diagnostic (defined below), on the terms and conditions set forth herein.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing and the mutual promises and covenants hereinafter set forth, Celladon and AmpliPhi, intending to be legally bound, hereby agree as follows:

1. DEFINITIONS.

1.1 "AAV1/GFP" shall mean a recombinant AAV Vector consisting of a single-stranded nucleotide DNA containing a GFP expression cassette flanked by adeno-associated virus (AAV) serotype 2 Inverted Terminal Repeat sequences packaged in AAV serotype 1 capsid protein, the manufacture, use, sale, offer for sale, or import of which AAV Vector is covered by the Group 2 Patents.

1.2 "AAV Vector" shall mean an adeno-associated virus gene vector composed of a viral capsid comprising three proteins known as VP1, VP2 and VP3, wherein the genome is a single-strand DNA molecule flanked by inverted terminal repeats, excluding any heterologous non- adeno-associated-virus nucleic acid sequence (other than Mydicar), taken by itself, or any data, know-how, or information specific to such DNA molecule or sequence.

1.3 "Active Development" shall have the meaning provided in the Penn Agreement.

1.4 "Affiliate" shall mean any company or entity controlled by, controlling, or under common control with a party hereto and shall include any company more than 50% of whose voting stock or participating profit interest is owned or controlled, directly or indirectly, by a party,

and any company which owns or controls, directly or indirectly, more than 50% of the voting stock of a party.

1.5 "Asset Purchase Agreement" shall mean that certain Asset Purchase Agreement dated as of the Effective Date between Celladon and AmpliPhi.

1.6 "Celladon Product" shall mean an AAV Vector-delivered product, the mechanism of action of which is modulation of macromolecules (*e.g.*, proteins) whose role is to regulate the uptake or release of calcium in the sarcoplasmic reticulum. Celladon Products include, without limitation, Mydicar.

1.7 "Commercially Reasonable Efforts" means, with respect to the efforts to be expended by any entity with respect to any objective, the level of reasonable, diligent, good faith efforts and resources devoted to accomplish such objective as a typical biopharmaceutical company would normally use to accomplish a similar objective under similar circumstances.

1.8 "Companion Diagnostic" shall mean a diagnostic device comprising an *in vitro* neutralizing antibody assay that (a) uses AAV1/GFP, and (b) is used, or intended for use, as a companion diagnostic for a Celladon Product. Without limiting the foregoing, **"Companion Diagnostic"** may include, without limitation, (i) an *in vitro* diagnostic test to identify patients who are most likely to benefit from a particular Celladon Product, to identify patients likely to be at increased risk for serious adverse reactions as a result of treatment with a particular Celladon Product, or to monitor patient response to treatment with a particular Celladon Product, or (ii) an *in vitro* diagnostic test that is intended to provide information that is useful to the physician regarding the use of a particular Celladon Product, whether or not it is a determining factor in the safe and effective use of such Celladon Product.

1.9 "Confidential Information" shall have the meaning provided in Section 6.1.

1.10 "FDA" shall mean the United States Food and Drug Administration, or any successor agency thereto.

1.11 "Field" shall mean the development and commercialization of Celladon Products for all human therapeutic and/or prophylactic applications.

1.12 "Green Fluorescent Protein" or **"GFP"** shall mean a protein composed of 238 amino acid residues that exhibits bright green fluorescence when exposed to light in the blue to ultraviolet range.

1.13 "Group 2 Patents" shall have the meaning provided in the Penn Agreement.

1.14 "Information" shall mean all tangible and intangible (a) techniques, technology, practices, trade secrets, inventions (whether patentable or not), methods, knowledge, know-how, skill, experience, test data and results (including pharmacological, toxicological and clinical test data and results), analytical and quality control data, results or descriptions, software and algorithms and (b) compositions of matter, cells, cell lines, assays, animal models and physical, biological or chemical material.

1.15 "Knowledge" shall mean the actual knowledge of a particular fact or other matter being possessed as of the pertinent date by the directors and officers of the applicable party.

1.16 "Mydicar" shall mean the Celladon product known as MYDICAR® (AAV1/SERCA2a).

1.17 "Net Sales" shall mean the gross amounts invoiced or otherwise charged by Celladon, its Affiliates or Sublicensee for the sale or transfer of Companion Diagnostics (excluding sales or transfers of Companion Diagnostics to Affiliates or Sublicensees of the selling party for resale of such Companion Diagnostics in transactions subject to sales royalties hereunder), less the following items, as allocable to such sale or transfer of such Companion Diagnostics (if not previously deducted in calculating the amount invoiced): (i) reasonable and customary trade, quantity and cash discounts and rebates and retroactive price reductions or allowances actually allowed or granted; (ii) credits or allowances actually granted upon claims, rejections or returns of such sales of Companion Diagnostics, including recalls; (iii) taxes, duties and other governmental charges imposed on the production, sale, delivery, use or importation of Companion Diagnostics (including, without limitation, sales, use, excise or value added taxes, but excluding income taxes) that are included in the invoiced amount and paid by the purchasing party; (iv) government-mandated and other reasonably and customary rebates (such as those in respect of any state or federal Medicare, Medicaid or similar programs) and charge-backs, including those granted to managed care entities, in all such cases that effectively reduce the net selling price of such Companion Diagnostics; (v) the actual amount of write-offs for bad debt directly relating to sales of Companion Diagnostics, determined in accordance with U.S. generally accepted accounting practices, consistently applied, not to exceed 4.0% of gross amounts invoiced or charged; and (vi) transportation charges relating to such Products, including handling charges and insurance premiums relating thereto to the extent included in the invoiced amount and paid by the purchasing party.

In the event of (a) any sales or transfers of Companion Diagnostics that are not at arm's length, or (b) any sales or transfers of Companion Diagnostics that are made in conjunction with sales of other products or services, with or without a separate price for such Companion Diagnostics (in either case, a ***"Non-Arm's-Length Transactions"***); then, for purposes of calculating royalties due hereunder, the Net Sales applicable to Companion Diagnostics sold or transferred in such Non-Arm's-Length Transaction shall be determined by multiplying (x) the number of units of Companion Diagnostics sold or transferred in such Non-Arm's-Length Transaction by (y) the average Net Sales per unit of such Companion Diagnostics for all sales of such Companion Diagnostics (excluding Non-Arm's-Length Transactions) made during the last full quarter prior to such transaction or during the current quarter if such Companion Diagnostics was not commercially available throughout the last full quarter.

1.18 "Penn Payments" shall mean all royalty payments under Section 4.1.2 of the Penn Agreement, and all milestone payments under Section 4.3 of the Penn Agreement, that, in each case become due or payable by AmpliPhi to Penn as a result of Celladon's (or its Affiliate's or Sublicensee's) exercise of the sublicense granted to Celladon pursuant to Section 2.1.

1.19 "Sublicensee" shall mean a Third Party to whom Celladon grants a sublicense under the license granted to Celladon pursuant to Section 2.1 hereof as permitted by this Agreement.

1.20 "Third Party" shall mean any entity other than Celladon or AmpliPhi or an Affiliate of Celladon or AmpliPhi.

1.21 "Valid Claim" shall mean an unexpired claim of an issued patent within the Group 2 Patents that has not been found to be unpatentable, invalid or unenforceable by a court or other authority of competent jurisdiction in the subject country, from which decision no appeal is taken or can be taken.

2. SUBLICENSE.

2.1 Sublicense Grant to Celladon. Subject to the terms and conditions of this Agreement (including, without limitation, Section 2.2 hereof), AmpliPhi hereby grants to Celladon an exclusive (even as to AmpliPhi), worldwide, fee- and royalty-bearing, sublicense, including the limited right to further sublicense (subject to Section 2.3 below), under the Group 2 Patents to develop, make, have made, use, sell, have sold, offer for sale and import Companion Diagnostics in the Field.

2.2 Penn Agreement. Celladon acknowledges that the sublicense granted under Section 2.1 with respect to the Group 2 Patents is subject to and limited by the terms and conditions of the Penn Agreement (and the scope of rights licensed thereunder). Celladon shall comply with the applicable terms and conditions of the Penn Agreement and take such actions as are reasonably required for AmpliPhi to comply with the Penn Agreement with respect to Celladon's (and its Affiliates' and Sublicensees') development and commercialization of Companion Diagnostics and related exercise of the sublicense granted hereunder, such as, for example and without limitation, providing such information and reports as are required for AmpliPhi to meet its reporting obligations under the Penn Agreement with respect to Celladon's (and its Affiliates' and Sublicensees') development and commercialization of Companion Diagnostics. In addition, during the term of this Agreement, Celladon shall use Commercially Reasonable Efforts to have a Companion Diagnostic in Active Development. Celladon's payment obligations with respect to the Penn Agreement are set forth in Section 3.1.

2.3 Further Sublicensing. Celladon shall have the power to sublicense its rights to a downstream sublicensee that is an Affiliate of Celladon or to a Third Party collaborator solely for purposes of research, development or other non-commercial purposes, or as reasonably necessary, to manufacturers or distributors for the account of Celladon, but only on condition that any sublicense requires such Affiliate or Third Party collaborator to comply with the applicable terms of this Agreement and prohibits further sublicensing. Celladon shall require its Affiliates and all Sublicensees to comply with the applicable terms and conditions of this Agreement (and Celladon shall remain liable for any breach by such Affiliate or Sublicensee of any of the terms and conditions of this Agreement). Celladon shall provide to AmpliPhi a complete and accurate copy of all agreements granting any such sublicense hereunder within 30 days after such agreement is executed, provided that Celladon may redact from such copy any proprietary or confidential information that is not necessary for AmpliPhi to ascertain Celladon's compliance with its obligations under this Agreement.

2.4 Responsibility for Companion Diagnostic Development and Commercialization. Celladon shall be solely responsible for the worldwide development, manufacture and commercialization of Companion Diagnostics. Celladon and its Affiliates and Sublicensees shall comply with all applicable laws, rules and regulations in connection with the

development, manufacture, marketing, promotion and sale of Companion Diagnostics by Celladon or any of its Affiliates or Sublicensees. The parties hereby acknowledge and agree that GFP is not subject to this Agreement and Celladon shall be solely and fully responsible for obtaining GFP and any and all intellectual property and other rights therein and thereto.

3. PAYMENTS.

3.1 Sublicense Fees.

(a) Sublicense Initiation Fee. Within 10 days after the Effective Date, Celladon shall pay to AmpliPhi a sublicense initiation fee of $310,000.

(b) Sublicense Maintenance Fees. On or before May 15 of each year following the Effective Date during the term of this Agreement, Celladon shall pay to AmpliPhi an annual sublicense maintenance fee of $310,000.

3.2 Reimbursement of AmpliPhi for Penn Payments. Celladon shall pay to AmpliPhi all Penn Payments that become due and payable by AmpliPhi pursuant to the Penn Agreement. Celladon shall make payment to AmpliPhi of such Penn Payments at least 10 days before such Penn Payments are due from AmpliPhi to Penn, together with reasonable supporting documentation but in any event at least such documentation as required for AmpliPhi to comply with its associated reporting obligations under the Penn Agreement. AmpliPhi and Celladon shall keep complete and accurate records pertaining to the Penn Payments and the calculation thereof, and Celladon and AmpliPhi shall each have the right to cause an independent, certified public accountant reasonably acceptable to the other party to audit such records, in each case in accordance with Section 3.7.

3.3 Royalties on Companion Diagnostics.

(a) Royalty. Subject to the terms and conditions of this Agreement, Celladon shall pay to AmpliPhi a [...***...] percent ([...***...]%) royalty on Net Sales of any Companion Diagnostic, the manufacture, use or sale of which is claimed or covered by a Valid Claim of the Group 2 Patents in the country of sale.

(b) Royalty Term. Celladon's royalty payment obligations under this Section 3.3 will expire on a Companion Diagnostic-by-Companion Diagnostic and country-by-country basis upon the expiration of the last-to-expire of the Group 2 Patents containing a Valid Claim claiming or covering the manufacture, use or sale of such Companion Diagnostic in such country.

(c) Payment Timing. Celladon will make royalty payments to AmpliPhi within 45 days of the last day of each calendar quarter for which such payment are due under this Section 3.3. Each such payment will be accompanied by a written report showing the cumulative Net Sales received by Celladon, its Affiliates and Sublicensees during such calendar quarter and the corresponding payments due under this Agreement.

3.4 No Other Payments. Sections 3.1, 3.2 and 3.3 set forth Celladon's entire payment obligation with respect the sublicense granted under Section 2.1 hereof.

3.5 Exchange Rate; Manner and Place of Payment. All payments hereunder shall be payable in U.S. dollars. When conversions of payments from any foreign currency is necessary pursuant to this Agreement, such conversion shall be made using the applicable average mid-rate exchange rate for converting the applicable currency to the U.S. dollar as published by *The Wall Street Journal* on the last business day of each month during the calendar quarter for which payment is due. All payments owed under this Agreement shall be made by wire transfer in immediately available funds to a bank and account designated in writing by AmpliPhi, unless otherwise specified in writing by AmpliPhi.

3.6 Income Tax Withholding. AmpliPhi shall pay any and all taxes levied on AmpliPhi on account of any payments made to it under this Agreement. If any taxes are required to be withheld by Celladon, Celladon shall (a) deduct such taxes from the payment made to AmpliPhi, (b) timely pay the taxes to the proper taxing authority, and (c) send proof of payment to AmpliPhi and certify its receipt by the taxing authority within 30 days following such payment. Celladon shall reasonably cooperate with AmpliPhi to obtain any applicable reductions or exemptions from any such withholding taxes, if any, in accordance with applicable law.

3.7 Audits. To the extent required by the Penn Agreement, Celladon shall keep, and shall cause its Affiliates and Sublicensees to keep, complete and accurate records pertaining to Penn Payments in sufficient detail to permit AmpliPhi to confirm the accuracy of the Penn Payments due hereunder. AmpliPhi shall have the right to cause an independent, certified public accountant selected by AmpliPhi, who does not currently provide AmpliPhi auditing services, and who is reasonably acceptable to Celladon, to audit such records to confirm Penn Payments due hereunder for a period covering not more than the preceding three years. Such audits may be exercised during normal business hours upon reasonable prior written notice to Celladon. Prompt adjustments shall be made by the parties to reflect the results of such audit and Celladon shall promptly remit to AmpliPhi the amount of any underpayment. AmpliPhi shall bear the full cost of such audit unless such audit discloses an underpayment by Celladon of more than 10% of the amount of payments due under this Agreement, in which case, Celladon shall bear the full cost of such audit.

4. INTELLECTUAL PROPERTY

4.1 Patent Prosecution and Maintenance.

(a) As of the Effective Date, ***Exhibit A*** hereto lists all Group 2 Patents.

(b) As between AmpliPhi and Celladon, AmpliPhi, or AmpliPhi's designee, shall have the first right to prepare, file, prosecute and maintain, the Group 2 Patents (to the extent that AmpliPhi has the right to do so under the Penn Agreement), at AmpliPhi's sole expense. With respect to any Group 2 Patents, to the extent that AmpliPhi has primary prosecution and maintenance responsibility with respect thereto, AmpliPhi, upon reasonable request from Celladon from time to time, shall consult with Celladon as to the general status of the preparation, filing, prosecution and maintenance of such Group 2 Patents.

(c) In the event that AmpliPhi elects, in any country, not to continue to prosecute and thereby to abandon an application for, or not to maintain and thereby abandon, a Group 2 Patent (excluding any such abandonment with respect to a patent application where the subject matter of the applicable patent application is the subject, or still eligible to be the subject, of another patent application in the country where such patent application is being abandoned; and, in any event, to the extent that AmpliPhi has primary prosecution and maintenance responsibility with respect to such Group 2 Patent), then AmpliPhi shall notify Celladon not less than 60 days before the next deadline for any action that may be taken with respect to such Group 2 Patent with the U.S. Patent & Trademark Office or any foreign patent office. At Celladon's request, AmpliPhi and Celladon shall discuss in good faith the potential assumption by Celladon of responsibility for such Group 2 Patent, at Celladon's cost and expense (if such assumption of responsibility is possible considering other AmpliPhi licensees or sublicensees of such Group 2 Patent and to the extent permitted by the Penn Agreement).

4.2 Cooperation of the Parties. Each party agrees to cooperate fully in the preparation, filing, prosecution and maintenance of any Group 2 Patent under this Agreement and in the obtaining and maintenance of any patent extensions, supplementary protection certificates and the like with respect to any Group 2 Patent (solely to the extent permitted in the Penn Agreement). Such cooperation includes, but is not limited to promptly informing the other party of any matters coming to such party's attention that may affect the preparation, filing, prosecution or maintenance of any such Group 2 Patent. AmpliPhi agrees that it shall not seek any patent term extension or restoration based upon the regulatory review and approval of a Companion Diagnostic or corresponding Celladon Product in any market or country without the prior written approval by Celladon.

4.3 Patent Enforcement. If a party becomes aware of any Third Party's manufacture, use, sale, offer for sale or import of a product that is competitive with a Companion Diagnostic and such party believes or suspects that such Third Party's activities infringe, or may infringe, any Group 2 Patent, including the filing by any Third Party of any certification filed under the United States Drug Price Competition and Patent Term Restoration Act of 1984 (collectively, ***"Competitive Infringement"***), such party shall promptly notify the other party in writing thereof, including the identity of such Third Party (the ***"Infringer"***), which notice shall set forth in reasonable detail the facts and circumstances of such activities that are known to such party. To the maximum extent permitted by the Penn Agreement, Celladon, at its sole expense, shall have the right to determine the appropriate course of action to enforce Group 2 Patents against the Infringer or otherwise abate the Competitive Infringement, to take (or refrain from taking) appropriate action to enforce Group 2 Patents against the Infringer, to defend any declaratory judgments by an Infringer seeking to invalidate or hold the Group 2 Patents unenforceable, to control any litigation or other enforcement action and to enter into, or permit, the settlement of any such litigation, declaratory judgments or other enforcement action with respect to Group 2 Patents, in each case in Celladon's own name and, if necessary for standing purposes, in the name of AmpliPhi and shall consider, in good faith, the interests of AmpliPhi in so doing. If Celladon does not, within one hundred twenty (120) days of receipt of notice from AmpliPhi, abate the Competitive Infringement or file suit to enforce the Group 2 Patents against the Infringer, AmpliPhi shall have the right to take whatever action it deems appropriate to enforce the Group 2 Patents. The party controlling any such enforcement action shall not settle the action or otherwise consent to an adverse judgment in such action that diminishes the rights or interests of the non-controlling party without the prior written consent of the other party. All monies recovered upon the final judgment or settlement of

any such suit to enforce the Group 2 Patents shall first be applied to reimburse each party, and, if applicable, Penn, for their respective litigation expenditures, with remaining recoveries being subject to Celladon's payment obligations under Section 3.2 to the extent required by the Penn Agreement, after which any remaining recovery shall be shared by the parties in relation to the damages suffered by each party.

4.4 Third Party Infringement Claims. AmpliPhi shall not have the right to settle any infringement claim or action by a Third Party alleging that the manufacture, use, sale, offer for sale or import of any Companion Diagnostic infringes the Patents of a Third Party, without the prior written consent of Celladon. Such consent shall not be unreasonably withheld or delayed, but may be withheld if such settlement would materially and adversely affect Celladon's interests.

(a) Celladon's Right to Defend. Celladon shall have the sole right to control any defense of any such claim involving alleged infringement of Third Party Patents by Celladon's activities at its own expense and by counsel of its own choice, and AmpliPhi shall have the right, at its own expense, to be represented in any such action by counsel of its own choice.

(b) AmpliPhi's Right to Defend. AmpliPhi shall have the sole right to control any defense of any such claim involving alleged infringement of Third Party rights by AmpliPhi's activities at its own expense and by counsel of its own choice, and Celladon shall have the right, at its own expense, to be represented in any such action by counsel of its own choice, to the extent AmpliPhi is not contractually restricted from allowing Celladon to do so.

Nothing in this Section 4.4 shall require either party to conduct patent searches or otherwise seek to determine the existence of any such infringement.

5. REPRESENTATIONS, WARRANTIES AND COVENANTS

5.1 Mutual Representations and Warranties. Each party represents and warrants to the other that: (a) it is duly organized and validly existing under the laws of its jurisdiction of incorporation or formation, and has full corporate or other power and authority to enter into this Agreement and to carry out the provisions hereof; (b) it is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder, and the person or persons executing this Agreement on its behalf has been duly authorized to do so by all requisite corporate or partnership action; and (c) this Agreement is legally binding upon it, enforceable in accordance with its terms, and does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any material law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it.

5.2 AmpliPhi Representations and Warranties.

(a) AmpliPhi represents and warrants to Celladon that, as of the Effective Date:

(i) AmpliPhi has not received written notice of any pending or threatened claims or litigation seeking to invalidate any Group 2 Patents;

(ii) to AmpliPhi's Knowledge, ***Exhibit A*** hereto is a true and complete list of Group 2 Patents that exists on the Effective Date and would, in the absence of the license

granted under Section 2.1, be infringed by the manufacture, use, sale, offer for sale or import of AAV1/GFP; and

(iii) AmpliPhi has not received written notice concerning the institution or possible institution of any interference, reexamination, reissue, revocation or nullification involving any Group 2 Patent.

(b) AmpliPhi additionally represents and warrants to Celladon that, as of the Effective Date:

(i) The Penn Agreement is valid, binding and in full force and effect and enforceable by AmpliPhi in accordance with its terms, except as enforcement may be limited by general equitable principles and the exercise of judicial discretion in accordance with such principles;

(ii) The consummation of the transaction contemplated by this Agreement will not, to the Knowledge of AmpliPhi, result in a breach of the Penn Agreement;

(iii) There exists no default or event of default or event, occurrence, condition or act, with respect to AmpliPhi, or to AmpliPhi's Knowledge, with respect to the other contracting party, which, with the giving of notice, the lapse of the time or the happening of any other event or conditions, would become a default or event of default under the Penn Agreement. AmpliPhi has not received written or oral notice of, and has no Knowledge of any (A) actual, alleged, possible or potential violation or breach of, or default under, the Penn Agreement, or (B) intent to effect, the cancellation, modification or termination of the Penn Agreement;

(iv) A true, correct and complete copy of the Penn Agreement has been made available to Celladon; and

(v) There are no outstanding amounts or fees due and payable by AmpliPhi to Penn under Section 4.2.6 or Section 7.1 of the Penn Agreement.

5.3 Covenant Regarding Penn Agreement. AmpliPhi hereby covenants that AmpliPhi will:

(a) comply with all terms and conditions of the Penn Agreement relating to AmpliPhi's rights to the Group 2 Patents;

(b) not voluntarily terminate the Penn Agreement or any of AmpliPhi's rights to the Group 2 Patents thereunder without Celladon's prior written consent; and

(c) not: (i) amend the Penn Agreement in any way that would limit, modify or restrict Celladon's rights and licenses hereunder or increase or modify Celladon's obligations hereunder, without Celladon's prior written consent; and (ii) waive any of AmpliPhi's rights under the Penn Agreement in a manner that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent. Without limiting the generality of the foregoing, AmpliPhi shall not consent or agree (by amendment, waiver, or other action of similar legal effect) to any limitation or narrowing of the scope of AmpliPhi's rights (as they exist

on the Effective Date) to any Group 2 Patent under the Penn Agreement that would adversely affect the rights and licenses granted to Celladon hereunder, without Celladon's prior written consent.

5.4 Disclaimer of Warranties. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, ALL TECHNOLOGY, INTELLECTUAL PROPERTY AND OTHER SUBJECT OF THIS AGREEMENT ARE PROVIDED "AS IS" AND THE PARTIES EXPRESSLY DISCLAIM ANY AND ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF DESIGN, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES, IN ALL CASES WITH RESPECT THERETO. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, ALL REPRESENTATIONS AND WARRANTIES, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED.

5.5 Limitation of Liability. NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT OR THE LICENSE GRANTED HEREUNDER; *provided, however,* that this Section 5.5 shall not be construed to limit either party's indemnification obligations under Article 7 and this Section 5.5 shall not apply to a breach of Article 6 hereunder.

6. CONFIDENTIALITY

6.1 Confidential Information. Except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the parties, the parties agree that the receiving party shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as expressly provided for in this Agreement any Information furnished to it by the other party pursuant to this Agreement (collectively, ***"Confidential Information"***). Each party may use such Confidential Information only to the extent expressly provided for in this Agreement. Each party will use at least the same standard of care as it uses to protect proprietary or confidential information of its own (which shall in any event shall at least be reasonable care) to ensure that its employees, agents, consultants and other representatives do not disclose or make any unauthorized use of the Confidential Information. Each party will promptly notify the other upon discovery of any unauthorized use or disclosure of the Confidential Information.

6.2 Exceptions. Confidential Information shall not include any information which the receiving party can prove by competent evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the receiving party, generally known or available to the public; (b) is known by the receiving party at the time of receiving such information, as evidenced by its records; (c) is hereafter furnished to the receiving party by a Third Party, as a matter of right and without restriction on disclosure; (d) is independently discovered or developed by the receiving party without the use of or reference to Confidential Information belonging to the disclosing party, as evidenced by its written records; or (e) is the subject of a written permission to disclose provided by the disclosing party.

6.3 Authorized Disclosure. Each party may disclose Confidential Information belonging to the other party if and to the extent such disclosure is reasonably necessary in the following instances:

(a) filing or prosecuting Patents as permitted by this Agreement;

(b) regulatory filings for AAV1/GFP and/or Companion Diagnostics as permitted by this Agreement;

(c) prosecuting or defending litigation as permitted by this Agreement;

(d) complying with applicable court orders or governmental regulations;

(e) disclosure to Third Parties in connection with due diligence investigations by such Third Parties, and disclosure to potential Third Party investors in confidential financing documents, provided, in each case, that any such Third Party agrees to be bound by reasonable terms of confidentiality and non-use, but in any event excluding any right to further disclose any Confidential Information to Third Parties; and

(f) disclosure to Affiliates, Sublicensees, employees and consultants of the receiving party, solely to the extent required to conduct development, manufacturing and/or commercialization activities in accordance with the sublicense granted under Section 2.1, in each case on the condition that such Affiliate, Sublicensee, employee or consultant agrees to be bound by terms of confidentiality and non-use at least equivalent in scope to those set forth in this Article 6 (excluding, without the written consent of both AmpliPhi and Celladon, the permission contained in this Section 6.3 permitting further disclosure to subsequent Third Parties).

In the event Celladon is required to make a disclosure of AmpliPhi's Confidential Information pursuant to Section 6.3(b), then, to the extent practicable under the circumstances and customary in the pharmaceutical industry for regulatory filings, Celladon shall use Commercially Reasonable Efforts to avoid unnecessary public disclosure of AmpliPhi's Confidential Information. Notwithstanding the foregoing in this Section 6.3, in the event a party is required to make a disclosure of the other party's Confidential Information pursuant to Section 6.3(c) or Section 6.3(d), it will, except where impracticable, give reasonable advance notice to the other party of such disclosure and use efforts to secure confidential treatment of such information at least as diligent as such party would use to protect its own confidential information, but in no event less than reasonable efforts. In any event, the parties agree to take all reasonable action to avoid disclosure of Confidential Information hereunder. The terms and conditions of this Agreement shall be Confidential Information of both parties hereunder and disclosure thereof by either party shall be subject to the limitations on disclosure set forth herein. The parties will consult with each other on the provisions of this Agreement to be redacted in any filings made by the parties with the Securities and Exchange Commission or as otherwise required by law.

6.4 Publications. AmpliPhi shall not have the right to make any publication (including any oral presentation and abstract) regarding any Companion Diagnostic being developed or commercialized hereunder without Celladon's prior written consent, which may be withheld in Celladon's sole discretion (it being understood that the foregoing shall not limit AmpliPhi's ability to make any publication regarding AAV Vectors outside the context of Celladon Products and Companion Diagnostics). AmpliPhi recognizes that the publication by or on behalf of Celladon, its Affiliates and Sublicensees of papers regarding any Companion Diagnostic, including oral presentations and abstracts, may be beneficial to both parties provided such publications are subject to reasonable controls to protect AmpliPhi's Confidential Information. Accordingly, AmpliPhi shall have the right to review and comment on any material proposed for disclosure or publication

by Celladon, such as by oral presentation, manuscript or abstract, which includes AmpliPhi's Confidential Information. Before any such material is submitted for publication, Celladon shall deliver a complete copy to AmpliPhi at least 45 days prior to submitting the material to a publisher or initiating any other disclosure. AmpliPhi shall review any such material and recommend any changes it reasonably believes are necessary to preserve Confidential Information to Celladon within 30 days of the delivery of such material to AmpliPhi, and Celladon shall comply with any request to remove or delete Confidential Information disclosed by AmpliPhi. With respect to oral presentation materials and abstracts, Celladon shall make reasonable efforts to expedite review of such materials and abstracts, and shall return such items as soon as practicable to Celladon with appropriate comments, if any, but in no event later than 30 days from the date of delivery to AmpliPhi. Celladon shall comply with AmpliPhi's request to delete AmpliPhi's Confidential Information in any such material and agrees to delay any submission for publication or other public disclosure for a period of up to an additional 60 days for the purpose of preparing and filing appropriate patent applications.

6.5 Publicity. It is understood that each party may desire or be required to issue press releases relating to this Agreement or activities thereunder. The parties agree to consult with each other reasonably and in good faith with respect to the text and timing of such press releases prior to the issuance thereof, provided that a party may not unreasonably withhold or delay consent to such releases, and that either party may issue such press releases as it determines, based on advice of counsel, are reasonably necessary to comply with laws or regulations or for appropriate market disclosure. In addition, either party shall be free to disclose, without the other party's prior written consent, the existence of this Agreement, the identity of the other party and those terms of the Agreement which have already been publicly disclosed in accordance herewith.

7. TERM

7.1 Term. The term of this Agreement shall begin on the Effective Date and, unless this Agreement is earlier terminated as set forth below, expire upon the expiration of the last-to-expire Group 2 Patent.

7.2 Termination. Celladon may terminate this Agreement at any time, for any reason or for no reason, upon 30 days' written notice to AmpliPhi.

7.3 Consequences of Expiration or Termination. Expiration or termination of this Agreement shall be without prejudice to any obligations (including payment obligations) of either party that have accrued prior to such expiration or termination. In addition, the provisions of Sections 3.5, 3.6, 3.7, 5.4, 5.5 and 7.3 and Articles 6, 8, 9 and 10 shall survive expiration or termination of this Agreement.

8. INDEMNIFICATION

8.1 Indemnification by AmpliPhi. AmpliPhi hereby agrees to save, defend and hold Celladon and its Affiliates and their respective directors, officers, employees and agents (each, a ***"Celladon Indemnitee"***) harmless from and against any and all liabilities, expenses, damages and/or loss, including reasonable legal expense and attorneys' fees (collectively, ***"Losses"***), to which any Celladon Indemnitee may become subject as a result of any claim, suit, demand, action or other proceeding by any Third Party (each a "***Claim***") to the extent arising directly or indirectly out of: (i) the breach by AmpliPhi of any warranty, representation, covenant or agreement made by

AmpliPhi in this Agreement; or (ii) the gross negligence or willful misconduct of any AmpliPhi Indemnitee (defined below); except, in each case, to the extent such Losses result from the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement or the gross negligence or willful misconduct of any Celladon Indemnitee.

8.2 Indemnification by Celladon. Celladon hereby agrees to save, defend and hold AmpliPhi and its Affiliates and their respective directors, officers, employees and agents (each, a ***"AmpliPhi Indemnitee"***) harmless from and against any and all Losses to which any AmpliPhi Indemnitee may become subject as a result of any Claim to the extent arising directly or indirectly out of: (i) the development, manufacture, use, handling, storage, sale, promotion, marketing or other disposition of AAV1/GFP or Companion Diagnostics by Celladon or any of its Affiliates and Sublicensees, including, without limitation, clinical trials in connection therewith, (ii) the breach by Celladon of any warranty, representation, covenant or agreement made by Celladon in this Agreement; or (iii) the gross negligence or willful misconduct of any Celladon Indemnitee; except, in each case, to the extent such Losses result from the breach by AmpliPhi of any warranty, representation, covenant or agreement made by AmpliPhi in this Agreement or the gross negligence or willful misconduct of any AmpliPhi Indemnitee.

8.3 Control of Defense. Any entity entitled to indemnification under this Article 7 shall give notice to the indemnifying party of any Claim that may be subject to indemnification hereunder, promptly after learning of such Claim, and the indemnifying party shall assume (and have the right to control) the defense of such Claim with counsel reasonably satisfactory to the indemnified party. If such defense is assumed by the indemnifying party with counsel so selected, the indemnifying party will not be subject to any liability for any settlement of such Losses made by the indemnified party without the indemnifying party's consent (but such consent will not be unreasonably withheld or delayed), and will not be obligated to pay the fees and expenses of any separate counsel retained by the indemnified party with respect to such Losses. The indemnifying party shall not settle any Claim other than solely for the payment of money by such indemnifying party without the indemnified party's consent, such consent not to be unreasonably delayed or withheld. The indemnified party shall have the right to participate, at its own expense and with counsel of its choice, in the defense of any Claim defended by the indemnifying party. The indemnified party shall reasonably cooperate with the indemnifying party with respect to the defense of any Claim.

9. DISPUTE RESOLUTION

9.1 Dispute Resolution. In the event of any dispute arising out of or relating to this Agreement, the parties shall, through their respective Chief Executive Officers, first meet and attempt to resolve the dispute in face-to-face negotiations. This meeting shall occur within 15 days after either party provides notice to the other party that it wishes to invoke such negotiations. If the parties are unable to resolve such dispute through such negotiations within such 15 day period, then, except in the case of a dispute, controversy or claim that concerns (a) the validity or infringement of a patent, trademark or copyright (unless concerning the payment of royalties hereunder) or (b) any antitrust, anti-monopoly or competition law or regulation, whether or not statutory, the dispute, controversy or claim shall be resolved exclusively by binding arbitration before a single independent and neutral experienced arbitrator selected by mutual agreement of the parties. In the event that the parties are unable to mutually agree on the appointment of such arbitrator, then such arbitration shall be conducted before a panel of three independent and neutral

experienced arbitrators, one chosen by AmpliPhi, one chosen by Celladon and the third chosen by the foregoing two arbitrators. Any such arbitration proceeding shall be administered by the American Arbitration Association, with limited discovery, in accordance with its then current rules of the American Arbitration Association governing commercial disputes. The place of arbitration shall be San Francisco, California. The arbitrator(s) shall have no authority to award punitive or similar damages. Except to the extent necessary to confirm an award or as may be required by law, neither a party nor any arbitrator may disclose the existence, content, or results of an arbitration without the prior written consent of both parties. In no event shall an arbitration be initiated after the date when commencement of a legal or equitable proceeding based on the dispute, controversy or claim would be barred by the applicable California statute of limitations. Each party shall bear its own attorneys' fees, costs and disbursements arising out of the arbitration, and shall pay an equal share of the fees and costs of the arbitrators; *provided, however,* that the arbitrators shall be authorized to determine whether a party is the prevailing party, and if so, to award to that prevailing party reimbursement for its reasonable attorneys' fees, costs and disbursements (including, for example, expert witness fees and expenses, photocopy charges, travel expenses, etc.) and/or the fees and costs of the arbitrators. Each party shall fully perform and satisfy the arbitration award within 15 days of the service of the award and such award can be entered into and enforced by any court of competent jurisdiction. By agreeing to this binding arbitration provision, the parties understand that they are waiving certain rights and protections which may otherwise be available if a dispute between the parties were determined by litigation in court, including, without limitation, the right to seek or obtain certain types of damages precluded by this provision, the right to a jury trial, certain rights of appeal and a right to invoke formal rules of procedure and evidence.

9.2 Injunctive Relief. Notwithstanding the provisions of Section 9.1, each party acknowledges and agrees that, due to the unique and valuable nature of the other party's proprietary information and materials, there can be no adequate remedy at law for any breach by such party of the provisions of this Agreement, that any such breach may result in irreparable harm to the other party for which monetary damages would be inadequate to compensate such party and that the other party shall have the right, in addition to any other rights available under applicable law, to obtain from any court of competent jurisdiction injunctive relief to restrain any breach or threatened breach of, or otherwise to specifically enforce, any covenant or obligation of such party under such provisions, without the necessity of posting any bond or security.

10. GENERAL PROVISIONS

10.1 Rights in Bankruptcy. All rights and licenses granted to either party under or pursuant to this Agreement are, and will otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code, licenses of right to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The parties agree that Celladon, as licensee of such rights under this Agreement, will retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code. The parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against AmpliPhi under the U.S. Bankruptcy Code, Celladon will be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, and same, if not already in its possession, will be promptly delivered to it (i) upon any such commencement of a bankruptcy proceeding upon its written request therefor, unless AmpliPhi elects to continue to perform all of its obligations under this Agreement, or (ii) if not delivered under (i) above, following the rejection of this Agreement by or on behalf of AmpliPhi upon written request therefor by Celladon.

10.2 Governing Law. This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding its conflicts of laws principles.

10.3 Entire Agreement; Modification. This Agreement, together with the Asset Purchase Agreement and the other Transaction Documents (as defined in the Asset Purchase Agreement), is both a final expression of the parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement, together with the Asset Purchase Agreement and the other Transaction Documents (as defined in the Asset Purchase Agreement), supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein. No rights or licenses with respect to any intellectual property of either party are granted or deemed granted hereunder or in connection herewith (by implication or otherwise), other than those rights expressly granted in this Agreement. This Agreement may only be modified or supplemented in a writing expressly stated for such purpose and signed by the parties to this Agreement.

10.4 Relationship Between the Parties. The parties' relationship, as established by this Agreement, is solely that of independent contractors. This Agreement does not create any partnership, joint venture or similar business relationship between the parties. Neither party is a legal representative of the other party, and neither party can assume or create any obligation, representation, warranty or guarantee, express or implied, on behalf of the other party for any purpose whatsoever.

10.5 Non-Waiver. The failure of a party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such party.

10.6 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either party without the prior written consent of the other party (which consent shall not be unreasonably withheld or delayed); *provided, however,* that either party may assign this Agreement and its rights and obligations hereunder without the other party's consent:

(a) in connection with the transfer or sale of such party or all or substantially all of the business of such party to which this Agreement relates to a Third Party, whether by merger, sale of stock, sale of assets or otherwise, provided that in the event of such a transaction (whether this Agreement is actually assigned or is assumed by the acquiring party by operation of law (*e.g.*, in the context of a reverse triangular merger)), intellectual property rights and technology of the acquiring party to such transaction (if other than one of the parties to this Agreement immediately prior to such transaction) shall not be included in the intellectual property and technology licensed hereunder, except to the extent already included in licenses granted hereunder prior to the consummation of such transaction; or

(b) to an Affiliate, provided that the assigning party shall remain bound by the terms and conditions of this Agreement and shall remain liable and responsible to the

non-assigning party hereto for the performance and observance of all such duties and obligations by such Affiliate.

The rights and obligations of the parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties. Any assignment not in accordance with this Agreement shall be void.

10.7 No Third Party Beneficiaries. This Agreement is neither expressly nor impliedly made for the benefit of any party other than Celladon and AmpliPhi and their respective successors and permitted assigns. For the avoidance of doubt, although each party has direct obligations to the other party with respect to the Penn Agreement, Penn is not intended, nor shall it be construed, to be a third party beneficiary of this Agreement.

10.8 Severability. If, for any reason, any part of this Agreement is adjudicated invalid, unenforceable or illegal by a court of competent jurisdiction, such adjudication shall not affect or impair, in whole or in part, the validity, enforceability or legality of any remaining portions of this Agreement. All remaining portions shall remain in full force and effect as if the original Agreement had been executed without the invalidated, unenforceable or illegal part.

10.9 Notices. Any notice to be given under this Agreement must be in writing and delivered either in person, by any method of mail (postage prepaid) requiring return receipt, or by overnight courier or facsimile confirmed thereafter by any of the foregoing, to the party to be notified at its address(es) given below, or at any address such party has previously designated by prior written notice to the other. Notice shall be deemed sufficiently given for all purposes upon the earliest of: (a) the date of actual receipt; (b) if mailed, three days after the date of postmark; or (c) if delivered by overnight courier, the next business day the overnight courier regularly makes deliveries.

If to Celladon, notices must be addressed to:

Celladon Corporation
12760 High Bluff Drive
Suite 240
San Diego, CA 92130
Attention: Chief Executive Officer
Facsimile: (858) 964-0974

If to AmpliPhi, notices must be addressed to:

AmpliPhi Biosciences Corporation
1100 Olive Way
Suite 100
Seattle, WA 98101
Attention: Philip J. Young

10.10 Force Majeure. Except for the obligation to make payment when due, each party shall be excused from liability for the failure or delay in performance of any obligation under this Agreement by reason of any event beyond such party's reasonable control including but not limited to Acts of God, fire, flood, explosion, earthquake, or other natural forces, war, civil unrest,

accident, destruction or other casualty, any lack or failure of transportation facilities, any lack or failure of supply of raw materials, any strike or labor disturbance, or any other event similar to those enumerated above. Such excuse from liability shall be effective only to the extent and duration of the event(s) causing the failure or delay in performance and provided that the party has not caused such event(s) to occur. Notice of a party's failure or delay in performance due to force majeure must be given to the other party within 10 days after its occurrence. All delivery dates under this Agreement that have been affected by force majeure shall be tolled for the duration of such force majeure. In no event shall any party be required to prevent or settle any labor disturbance or dispute.

10.11 Interpretation.

(a) Captions & Headings. The captions and headings of clauses contained in this Agreement preceding the text of the articles, sections, subsections and paragraphs hereof are inserted solely for convenience and ease of reference only and shall not constitute any part of this Agreement, or have any effect on its interpretation or construction.

(b) Singular & Plural. All references in this Agreement to the singular shall include the plural where applicable, and all references to gender shall include both genders and the neuter.

(c) Articles, Sections & Subsections. Unless otherwise specified, references in this Agreement to any article shall include all sections, subsections, and paragraphs in such article; references in this Agreement to any section shall include all subsections and paragraphs in such sections; and references in this Agreement to any subsection shall include all paragraphs in such subsection.

(d) Days. All references to days in this Agreement shall mean calendar days, unless otherwise specified.

(e) Ambiguities. Ambiguities and uncertainties in this Agreement, if any, shall not be interpreted against either party, irrespective of which party may be deemed to have caused the ambiguity or uncertainty to exist.

10.12 Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument.

[Remainder of this page intentionally left blank.]

IN WITNESS WHEREOF, the parties have duly executed this Sublicense Agreement as of the Effective Date.

CELLADON CORPORATION

By: /s/ Krisztina M. Zsebo
Krisztina M. Zsebo
Chief Executive Officer

AMPLIPHI BIOSCIENCES CORPORATION

By: /s/ Philip J. Young
Philip J. Young
President and CEO

Exhibit A

Group 2 Patents

See attached list.

Penn Docket Number	Targeted Docket Number	Attorney File Number	Brief Title	Patent Numbers and Dates
[...***...]	[...***...]	[...***...]	[...***...]	[...***...]

*****Confidential Treatment Requested**

Exhibit 10.23

*****Text Omitted and Filed Separately**
with the Securities and Exchange Commission
Confidential Treatment Requested
Under 17 C.F.R. Sections 200.80(b)(4)
and 230.406

AMENDED AND RESTATED
MANUFACTURING SERVICES AGREEMENT

This Amended and Restated Manufacturing Services Agreement (the **"Agreement"**) is made as of August 26, 2013 (the **"Restatement Date"**), between **Lonza Houston, Inc.,** a Delaware corporation having its principal place of business at 8066 El Rio St., Houston, TX 77054 (**"LHI"**), and **Celladon Corporation**, a Delaware corporation, having an office at 12760 High Bluff Drive, Suite 240, San Diego, CA 92130 (**"CLIENT"**) (each of LHI and CLIENT, a **"Party"** and, collectively, the **"Parties"**).

RECITALS

A. LHI and CLIENT are parties to that certain Manufacturing Services Agreement dated August 24, 2012 (the **"Original MSA"**), and now wish to amend and restate the Original MSA in its entirety as set forth herein, effective as of the Restatement Date.

B. LHI operates a multi-client production facility located at 8066 El Rio St., Houston, TX 77054 (the **"Facility"**).

C. CLIENT desires to have LHI conduct work according to one or more individual Statements of Work, as further defined in Section 1.33 below.

D. CLIENT desires to have LHI perform manufacturing processes to produce one or more products, one of which containing a recombinant viral vector and intended for therapeutic use in humans, and LHI desires to produce such product.

E. CLIENT desires to have LHI manufacture its proprietary AAV1-SERCA2a drug substance, an adenovirus-associated virus based vector containing the expression cassette for SERCA2a, and LHI desires to manufacture such product.

NOW, THEREFORE, in consideration of the foregoing and the mutual promises and covenants hereinafter set forth, LHI and CLIENT, intending to be legally bound, hereby agree as follows:

AGREEMENT

1. DEFINITIONS

When used in this Agreement, capitalized terms will have the meanings as defined below and throughout the Agreement. Unless the context indicates otherwise, the singular will include the plural and the plural will include the singular.

1.1 "Acceptance Period" shall have the meaning set forth in Section 5.2.2.

1.2 "Affiliate" means, with respect to either Party, any other corporation or business entity that directly, or indirectly through one or more intermediaries, controls, is controlled by or is under common control with such Party. For purposes of this definition, the term "control"

and, with correlative meanings, the terms "controlled by" and "under common control with" means direct or indirect ownership of more than fifty percent (50%) of the securities or other ownership interests representing the equity voting stock or general partnership or membership interest of such entity or the power to direct or cause the direction of the management or policies of such entity, whether through the ownership of voting securities, by contract, or otherwise.

1.3 "Batch" means a specific quantity of Product that is intended to have uniform character and quality, within specified limits, and is produced according to a single manufacturing order during the same cycle of manufacture

1.4 "Batch Record" means the production record pertaining to a Batch.

1.5 "cGMP" means the regulatory requirements for current good manufacturing practices promulgated by the FDA under 21 CFR Parts 210 and 211, and by the provisions of EC Commission Directive 2003/94/EC together with the Guide to Good Manufacturing Practice published by the EC Commission in 1992 (ISBN 92-826-3180-X), in each case as amended from time to time, and as interpreted by ICH Harmonised Tripartite Guideline, Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients.

1.6 "Change Order" has the meaning set forth in Section 2.2.

1.7 "CLIENT Background IP" means Intellectual Property, media, assays methods, cell lines, or virus constructs either (i) owned, licensed or otherwise Controlled by CLIENT as of the Effective Date or (ii) developed or acquired by CLIENT independently from performance under this Agreement during the term of this Agreement.

1.8 "CLIENT Development Materials" has the meaning set forth in Section 2.3.

1.9 "CLIENT Materials" means the CLIENT Development Materials and the CLIENT Production Materials.

1.10 "CLIENT Personnel" has the meaning set forth in Section 4.6.1.

1.11 "CLIENT Production Materials" has the meaning set forth in Section 4.1.

1.12 "Commencement Date" means the date set forth in the Statement of Work for the commencement of the production of the Product.

1.13 "Confidential Information" has the meaning set forth in Section 9.1.

1.14 "Control" or **"Controlled"**, in the context of intellectual property rights of a Party, shall mean that such Party or its Affiliate owns or possesses rights to intellectual property sufficient to grant the applicable license, sublicense or access (as appropriate) under this Agreement, without violating the terms of any agreement with a Third Party.

1.15 "Disapproval Notice" shall have the meaning set forth in Section 5.2.2.

1.16 "Effective Date" means August 24, 2012.

1.17 "EMA" means the European Medicines Agency, and any successor agency thereof.

1.18 "FDA" means the U.S. Food and Drug Administration, and any successor agency thereof.

1.19 "Intellectual Property" means any and all inventions, whether or not patentable, worldwide patents, copyrights, trade secrets, know-how and all other intellectual property rights, including all applications and registrations with respect thereto, but excluding all trademarks, trade names, service marks, logos and other corporate identifiers.

1.20 "LHI Background IP" means Intellectual Property, media, assays, methods, cell lines, or virus constructs either (i) owned, licensed or otherwise Controlled by LHI as of the Effective Date or (ii) developed or acquired by LHI independently from performance under this Agreement during the term of this Agreement.

1.21 "LHI Operating Documents" means LHI's standard operating procedures, standard manufacturing procedures, protocols, validation documentation (excluding process validation documents solely related to CLIENT's Process or Product), and supporting documentation used by LHI, such as environmental monitoring, for operation and maintenance of the Facility and LHI equipment used in the process of producing the Product, excluding any of the foregoing that are unique to the manufacture of Product or developed by LHI in the manufacture of and solely related to the Product. For clarity, CLIENT Materials shall not be included as LHI Operating Documents.

1.22 "LHI Parties" has the meaning set forth in Section 14.2.

1.23 "LHI Technology Transfer" means the transfer of documentation, specifications (including raw material specifications), process validation documents specifically related to CLIENT's Process or Product (but, for clarity, shall not include LHI Operating Documents), and production process by LHI to CLIENT pertaining to each Process performed and/or developed by LHI hereunder.

1.24 "Materials" means all raw materials and supplies to be used in the production of a Product.

1.25 "Process" means the manufacturing process for a Product performed by LHI pursuant to the terms of this Agreement.

1.26 "Product" has the meaning set forth in a Statement of Work.

1.27 "Product Warranties" means those warranties as specifically stated in Section 5.2.2.

1.28 "Production Term" shall have the meaning set forth in Section 4.3.

1.29 "Regulatory Approval" means the approval by the FDA or EMA to market and sell the Product in the United States or the European Union, respectively.

1.30 "SOP" means a standard operating procedure.

1.31 "SOW Documentation" means the compilation of documentation generated by LHI in preparation of and during the performance of a given SOW, including, without limitation, executed batch records, component records, test records and test record forms, certificates of analysis, study protocols, study summary reports, deviation reports, laboratory investigations, environment excursions, formulation records, and other related documents.

1.32 "Specifications" means the applicable Product specifications set forth in the applicable Statement of Work or as modified from time to time upon mutual agreement of the Parties in connection with the production of a particular Batch of Product hereunder.

1.33 "Statement of Work" or **"SOW"** means a written outline of a plan setting forth each Party's responsibility with respect to the performance of a Process or manufacture of the Product or related activities that is executed by both Parties pursuant to Section 2.1.

1.34 "Third Party" means any party other than LHI, CLIENT or their respective Affiliates.

2. STATEMENTS OF WORK - PROCESS AND PRODUCT DEVELOPMENT; PERFORMANCE

2.1 Statement of Work. Prior to performing any Process or Product development, technology transfer from CLIENT to LHI, Process, or Product manufacture, the Parties will collaborate to develop a Statement of Work, describing the activities to be performed by the Parties, or to be subcontracted by LHI to Third Parties. It is contemplated that each separate project shall have its own Statement of Work. Each Statement of Work shall state that it is entered into pursuant to this Agreement and is subject in all respects to the terms and conditions hereof. Once agreed to by the Parties, the Statement of Work shall be executed by each of the Parties. In the event of a conflict between the terms and conditions of this Agreement and any Statement of Work, the terms and conditions of this Agreement shall control.

2.2 Modification of Statement of Work. Should CLIENT want to change a Statement of Work or to include additional services to be provided by LHI, CLIENT may propose to LHI an amendment to the applicable Statement of Work with the desired changes or additional services (**"Change Order"**). If LHI reasonably determines that it has the resources and capabilities to accommodate such Change Order, LHI and CLIENT will negotiate in good faith a modified version of the Statement of Work reflecting such Change Order (including, without limitation, any changes to the estimated timing, estimated charges or scope of a project). The modified Statement of Work shall be binding on the Parties only if it states that it is entered into pursuant to this Agreement and is subject in all respects to the terms and conditions hereof, and is signed by both Parties. Whereafter such modified version of the Statement of Work will be deemed to have replaced the prior version of the Statement of Work. Notwithstanding the foregoing, and following good faith negotiations of the Parties, if a modified version of the Statement of Work is not agreed to by both Parties, the existing Statement of Work shall remain in effect unless terminated by CLIENT in its sole discretion upon thirty (30) days prior written notice, in which case CLIENT shall be responsible for any charges for materials that have already been purchased for such Statement of Work and CLIENT shall pay reasonable costs

incurred by LHI up to the effective date of termination, including all un-cancellable labor commitments and all work in process including all professional services rendered through the effective date of termination.

2.3 CLIENT Deliverables. Within the time period specified in the applicable Statement of Work, CLIENT will provide LHI with (a) the materials listed in the Statement of Work for which CLIENT is responsible for delivering to LHI, and any handling instructions, protocols, SOPs and other documentation necessary to maintain the properties of such materials for the performance of the Statement of Work, and (b) any protocols, SOPs and other information and documentation in possession or control of CLIENT and necessary for the performance of the Statement of Work, and for the preparation of the SOW Documentation in conformance with cGMP, including, without limitation, process information, SOPs, development data and reports, quality control assays, raw material specifications (including vendor, grade and sampling/testing requirements), product and sample packing and shipping instructions, and product specific cleaning and decontamination information, (collectively, the **"CLIENT Development Materials"**). If CLIENT does not provide the CLIENT Development Materials within the time period specified in a Statement of Work, then CLIENT shall be responsible for any costs incurred by LHI arising from such failure.

2.4 Performance by LHI. Subject to the provision by CLIENT of the CLIENT Development Materials pursuant to Section 2.3, LHI will use commercially reasonable efforts to perform, directly or through a Third Party contractor (provided such Third Party contractor is specified in the Statement of Work or approved by CLIENT in writing, such approval not to be unreasonably withheld), the work described in each applicable Statement of Work, LHI will perform such work in a professional and workmanlike manner in accordance with the terms of this Agreement and all applicable federal, state, and local laws, rules and regulations in the United States or European Union. LHI will use commercially reasonable efforts to promptly notify CLIENT of any material delays that arise during the performance of the Statement of Work.

3. VALIDATION; TECHNOLOGY TRANSFER

3.1 As set forth in the applicable Statement of Work, LHI will prepare the SOW Documentation for the applicable Process in accordance with the schedule set forth in the applicable Statement of Work, Specifications, the LHI Operating Documents and written information provided by CLIENT. CLIENT will inform LHI of any specific requirements CLIENT may have relating to the SOW Documentation, including, without limitation, any information or procedures CLIENT wishes to have incorporated therein. If LHI intends to include in the SOW Documentation the use of any assay, medium, or other technology that is not commercially available, LHI will inform CLIENT of such intention and the Parties will meet to discuss and attempt to agree in good faith on the terms of use of such non-commercially available materials or technology in the Process. The SOW Documentation shall be completed and delivered by LHI at completion of a Batch.

3.2 CLIENT will cooperate with LHI to assist LHI to develop the SOW Documentation and a Process in accordance with the applicable Statement of Work, including, without limitation, by providing LHI with additional information and procedures as may be

required to create the SOW Documentation, Process, and/or any of the following: (i) manufacturing process information, SOPs, development reports, (ii) quality control assays, (iii) raw material specifications (including vendor, grade and sampling/testing requirements), (iv) Product and sample packing and shipping instructions, (v) Product specific cleaning and decontamination information.

3.3 LHI will deliver a draft version of each SOW Documentation to CLIENT for its review and approval in accordance with the schedule set forth in the applicable Statement of Work. CLIENT will notify LHI in writing of any objections it has to such draft SOW Documentation, and upon such notification, representatives of LHI and CLIENT will meet promptly to resolve such objections. Upon CLIENT's written acceptance of the draft SOW Documentation, or in the event that CLIENT does not submit a written notice setting forth CLIENT's objections to the draft SOW Documentation within twenty (20) days following receipt of such draft by CLIENT, such draft will be deemed approved by CLIENT.

3.4 LHI Technology Transfer. Subject to the terms set forth herein, upon CLIENT's reasonable request and at CLIENT's reasonable cost, LHI will provide technology transfer assistance services to CLIENT in order to establish of Product manufacturing capabilities at CLIENT's facility or at one or more Third Party contract manufacturers selected by CLIENT solely for the purposes of manufacturing the Product; *provided, however,* to the extent such technology transfer includes any LHI Materials, LHI Background IP or LHI Confidential Information, the Parties shall negotiate in good faith a reasonable royalty and/or licensing fee to be paid to LHI for the use of or reference to LHI Materials, LHI Background IP or LHI Confidential Information. Such technology transfer assistance shall be limited to LHI Technology Transfer to CLIENT or its Third Party contract manufacturer, which LHI Technology Transfer shall not include training; *provided, however,* if LHI terminates this Agreement in accordance with Section 13.3.2 or CLIENT terminates this Agreement in accordance with Section 13.2, then as reasonably requested by CLIENT, during the [...***...] month period following any such termination, LHI shall make available employees of it and its Affiliates to CLIENT, at CLIENT's cost and expense, to provide reasonable technical support and assistance, for a duration of time not to exceed [...***...] months and at mutually agreed locations to facilitate an orderly transition of LHI Technology Transfer and operations. Notwithstanding the foregoing, LHI must, in writing, provide prior notice to CLIENT of its use or its intention to use any LHI Materials, LHI Background IP or LHI Confidential Information in performance of the services of this Agreement. CLIENT must agree, in writing, to LHI's use of any LHI Materials, LHI Background IP or LHI Confidential Information in performance of the services of this Agreement. Absent such notification by LHI and acceptance by the CLIENT, if LHI includes any LHI Materials, LHI Background IP or LHI Confidential Information in the performance of the services of this Agreement, LHI hereby grants to CLIENT a non-exclusive, irrevocable, fully paid-up, royalty-free, transferable, worldwide license, with the right to sub-license, to use the LHI Materials, LHI Background IP or LHI Confidential Information, solely to the extent necessary for making, using, selling, or offering for sale any Product manufactured hereunder. From time to time as reasonably requested by CLIENT during the term of the Agreement, and in any case upon any material change in or update to any of the Specifications for Product, LHI will provide CLIENT, or its designated contract manufacturer, with copies of the LHI Technology Transfer documentation, to the extent not already provided, including

without limitation: (a) all technical reports and materials for process development activities completed at the time of such transfer that are relevant to and would be required to manufacture Product using the processes as performed by LHI at such time (including but not limited to any recovery steps established, process validation, product identity assays, in-process-control assays, applicable computer software, relevant standard operating procedures (provided, however, LHI shall not be obligated to provide any LHI Operating Documents), (b) all regulatory filings relating to the manufacturing process or Product, and (c) all necessary CMC documentation relating to the manufacturing process for Product and required for regulatory filings or compliance.

4. MANUFACTURE OF PRODUCT; ORDER PROCESS; DELIVERIES

4.1 CLIENT Deliverables. Within the time period agreed to in the applicable Statement of Work, CLIENT will provide LHI with the materials listed in such Statement of Work required to be supplied by CLIENT for the manufacture of a Product, and any handling instructions, protocols, SOPs and other documentation necessary to maintain the properties of such materials for the performance of the applicable Statement of Work (collectively, the **"CLIENT Production Materials"**).

4.2 Commencement Date. Each Statement of Work governing the manufacture of Product will include a Commencement Date agreed upon by the Parties. LHI will commence manufacture of Product on or before the Commencement Date.

4.3 Manufacture by LHI. During the time period specified in any Statement of Work during which Product will be manufactured (the **"Production Term"**), LHI will use commercially reasonable efforts to manufacture, package, ship, handle quality assurance and quality control for the Product, all as set forth in the applicable Statement of Work, and to deliver to CLIENT the quantities of Product requested by CLIENT in such Statement of Work, all in accordance with the terms set forth in Section 4.4 below. Notwithstanding the foregoing, LHI shall have the right to revise the production schedule with respect to a Statement of Work provided that such schedule does not advance or delay commencement of the production of Batches under a Statement of Work by more than sixty (60) days.

4.4 Packaging and Shipping. LHI will package and label the Product for shipment in accordance with the SOW Documentation, the Specifications and LHI's standard practices in effect at the time of performance by LHI. LHI will ship Product FCA Facility using a common carrier designated by CLIENT to LHI in writing not less than ten days prior to the applicable delivery date unless otherwise agreed to in the applicable Statement of Work. CLIENT will provide to LHI its account number with the selected carrier and will pay for all shipping costs in connection with each shipment of Product. Each shipment will be accompanied by the documentation listed in the SOW Documentation or the applicable Statement of Work. Risk and title in the Product will pass upon delivery to the carrier. LHI will use commercially reasonable efforts to deliver each shipment of Product to CLIENT on the requested delivery date for such shipment. LHI will promptly notify CLIENT if LHI reasonably believes that it will be unable to meet the requested delivery date specific in the applicable purchase order for such shipment; the giving of such notice will not otherwise excuse LHI's performance under this Agreement. CLIENT shall be required to take delivery of a Batch of Product within thirty (30) days after acceptance of such Batch in accordance with Section 5.2 (the **"Delivery Period"**), unless

CLIENT requests in writing, and LHI consents in writing, to store the material on CLIENT's behalf and at CLIENT's expense.

4.5 Records. LHI will maintain complete and accurate records for the manufacture of each Batch of Product and the development of any Process, if applicable, as required by applicable laws and regulations. LHI will retain possession of the SOW Documentation, all Batch Records and LHI Operating Documents, and will promptly provide copies thereof upon CLIENT's request and at CLIENT's expense; provided however, LHI shall provide electronic copies of such documents, at CLIENT's request, at no cost to CLIENT. LHI Operating Documents will remain LHI Confidential Information. CLIENT has the right to use and reference any of the foregoing in connection with a filing for Regulatory Approval of the Product, to authorize release and final acceptance of Product delivered hereunder or as otherwise authorized by the Agreement.

4.6 CLIENT Access.

4.6.1 CLIENT's employees and agents (including its independent contractors) (collectively, **"CLIENT Personnel"**) may participate in the production of the Product only in such capacities as may be approved in writing in advance by LHI; *provided, however,* upon reasonable advance notice to LHI, CLIENT Personnel shall have the right to be present at the Facility to observe the production of Product for a reasonable amount of time. CLIENT Personnel working at the Facility are required to comply with LHI's Operating Documents and any other applicable LHI facility and/or safety policies. For the avoidance of doubt, CLIENT Personnel may not physically participate in the production or manufacture of any Product that may be used in or on humans.

4.6.2 CLIENT Personnel working at the Facility will be and remain employees of CLIENT, and CLIENT will be solely responsible for the payment of compensation for such CLIENT Personnel (including applicable Federal, state and local withholding, FICA and other payroll taxes, workers' compensation insurance, health insurance, and other similar statutory and fringe benefits). CLIENT covenants and agrees to maintain workers' compensation benefits and employers' liability insurance as required by applicable Federal and state laws with respect to all CLIENT Personnel working at the Facility.

4.6.3 CLIENT will pay for the actual cost of repairing or replacing to its previous status (to the extent that LHI determines, in its reasonable judgment, that repairs cannot be adequately effected) any property of LHI damaged or destroyed by CLIENT Personnel, provided CLIENT shall not be liable for repair or replacement costs resulting from ordinary wear and tear.

4.6.4 CLIENT Personnel visiting or having access to the Facility will abide by LHI standard policies, operating procedures and the security procedures established by LHI and brought to the attention of such CLIENT Personnel prior to any visits or access to the Facility. CLIENT will be liable for any breaches of security by CLIENT Personnel. In addition, CLIENT will reimburse LHI for the cost of any lost security cards issued to CLIENT Personnel, at the rate of $50 per security card. All CLIENT Personnel will agree to abide by LHI policies and SOPs established by LHI, and will sign an appropriate confidentiality agreement if one is not already in place with CLIENT governing such obligations.

4.6.5 CLIENT will indemnify and hold harmless LHI from and against any and all losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees and expenses) arising out of any injuries suffered by CLIENT Personnel while at the Facility or elsewhere, except to the extent caused by the gross negligence or willful misconduct on the part of any LHI Party, or resulting from a breach of this Agreement by an LHI Party.

4.7 Disclaimers. Each Party acknowledges and agrees that LHI Parties will not engage in any Product refinement or development of the Product, other than as expressly set forth in this Agreement and each applicable Statement of Work. Each Party acknowledges and agrees that LHI Parties have not participated in the invention or testing of any Product, and have not evaluated its safety or suitability for use in humans or otherwise.

4.8 Quality Agreement. Prior to the Restatement Date, the Parties entered into a separate quality agreement which describes the responsibilities of each Party's quality unit related to the manufacture of Product (the **"Quality Agreement"**). In the event of any conflict or inconsistency between the Quality Agreement and this Agreement, this Agreement shall govern at all times.

4.9 Genetic Alterations. LHI is not responsible for any genetic alterations that occur during production of any product, except for those genetic alterations that result from a grossly negligent or intentionally wrongful act or omission of LHI and not as a result of the predisposition of any material provided by CLIENT. Unless they arise from a grossly negligent or intentionally wrongful act or omission of LHI, genetic alterations shall not be the basis for a breach of warranty claim by CLIENT. If LHI fails to deliver materials in accordance with the terms of this Agreement or a Statement of Work, or if materials produced pursuant to the Statement of Work fail to meet any technical specification required by the Statement of Work, and such failure is due to genetic alterations which do not arise from a grossly negligent or intentionally wrongful act or omission of LHI, at CLIENT's option, LHI will re-perform the specific project at issue at the earliest practicable time, for an additional fee equal to the original fee for that part of the project.

5. PRODUCT WARRANTIES; ACCEPTANCE AND REJECTION OF PRODUCTS

5.1 Product Warranties. LHI represents and warrants that all Product manufactured by LHI pursuant to this Agreement, at the time of delivery pursuant to Section 4.4: (a) shall conform to the Specifications; (b) was manufactured in accordance with the SOW Documentation; and (c) where applicable, was manufactured in accordance with cGMP and any other applicable United States or European Union regulatory standards. LHI further represents and warrants that all Product manufactured hereunder is free and clear of any encumbrances, liens or other Third Party claims, including any claims of an approved subcontractor.

5.2 Approval of Completed Product.

5.2.1 When a SOW has been completed, LHI will notify CLIENT and supply CLIENT with the required documentation set forth in the SOW.

5.2.2 Within fifteen (15) calendar days after CLIENT's receipt of such documentation regarding such Product or within such time as mutually agreed by the Parties in

writing (the **"Acceptance Period"**), Client shall determine by review of such documentation whether or not the given Batch conforms to the product warranties set forth in Section 5.1 above (**"Product Warranties"**). If CLIENT asserts that any quantity of Product does not comply with the Product Warranties set forth in Section 5.1 above (a **"Defective Product"**), CLIENT will deliver to LHI, in accordance with the notice provisions set forth in Section 16.4 hereof, written notice of disapproval (the **"Disapproval Notice"**) of such Product, stating in reasonable detail the basis for such assertion of non-compliance with the Product Warranties. If a valid Disapproval Notice is received by LHI during the Acceptance Period, then LHI and CLIENT will provide one another with all related paperwork and records (including, but not limited to, quality control tests) relating to the manufacture of Product and the Disapproval Notice. If a valid Disapproval Notice is agreed upon or if any dispute regarding the conformity of a Batch of Product with the Product Warranties is resolved in favor of CLIENT in accordance with the terms set forth in Section 5.3 below, CLIENT, in its sole discretion, may return any quantity of Defective Product or the entire Batch of Product from which Defective Product is derived. If a valid Disapproval Notice is not received during the Acceptance Period, Product will be deemed accepted and ready for shipment to CLIENT, or storage for CLIENT, as applicable, in each case, subject to the detection of any Latent Defects as described in Section 5.3. If Product is to be shipped to CLIENT, then upon acceptance, the Product shall be delivered to CLIENT and CLIENT shall accept delivery thereof in accordance with Section 4.4. Title and risk of loss to such Product shall pass to CLIENT at the time of delivery to the common carrier pursuant to Section 4.4. If the Product is to be stored by LHI for CLIENT, LHI shall do so in accordance with agreed upon terms of a SOW which covers all relevant details of a Product storage engagement.

5.3 Latent Defects. If, within [...***...] months after CLIENT's initial acceptance or deemed acceptance (as described in Section 5.2.2) of a delivery of a Batch of Product, CLIENT determines that any such quantity of Product delivered hereunder is Defective Product, CLIENT will, promptly after such determination, inform LHI in writing about such Defective Product. LHI will reasonably cooperate with any subsequent investigation CLIENT may conduct and will engage in good faith discussions with CLIENT to determine the cause of such defect(s). If the Parties determine that the defect could not have been reasonably determined by CLIENT's release testing and the defect existed at the time of CLIENT's initial acceptance or deemed acceptance (as described in Section 5.2.2) (a **"Latent Defect"**), then CLIENT may revoke its acceptance with respect to such quantity of Product containing a Latent Defect by providing written notice to LHI of such revocation and the terms of Section 5.5 shall apply. If CLIENT does not notify LHI of a Latent Defect within [...***...] months after CLIENT's initial acceptance or deemed acceptance (as described in Section 5.2.2), CLIENT waives all remedies at law or in equity regarding such claim that the Product is Defective Product. Product containing a Latent Defect shall be deemed Defective Product hereunder. CLIENT acknowledges and agrees that [...***...] with respect to any Latent Defect [...***...].

5.4 Dispute Resolution. LHI and CLIENT will attempt to resolve any dispute regarding the conformity of a Batch of Product with the Product Warranties. If such dispute cannot be settled within 30 days of the submission by each Party of the related paperwork and records to the other Party, and if the Product is alleged not to conform with the Product Warranties set forth in Section 5.1(a), then CLIENT will submit a sample of the Batch of the disputed Product to an independent testing laboratory of recognized repute or an independent consultant with relevant expertise related to the dispute, in each case selected by CLIENT and approved by LHI (such approval not to be unreasonably withheld) for analysis, under quality assurance approved procedures, of the conformity of such Batch of Product with the Specifications. The costs associated with such analysis by such independent testing laboratory will be paid by the Party against whom the independent testing laboratory decides. The determination by the independent testing laboratory shall be binding on the Parties.

5.5 Remedies for Defective, Damaged, or Destroyed Product.

5.5.1 In the event that: (i) the Parties agree, or an independent testing laboratory or consultant determines, pursuant to Section 5.4, that a Batch of Product or portion thereof constitutes Defective Product (including Product containing a Latent Defect as described in Section 5.3), or (ii) Product and/or Materials are destroyed or damaged by LHI Personnel, due to the failure of (a) LHI personnel to properly execute the SOW Documentation, (b) LHI personnel to comply with cGMP, or (c) the Facility or equipment utilities; then, in each case, at CLIENT's request, LHI will, as soon as it is commercially practicable to do so and not later than [...***...] months after CLIENT's written request, produce for CLIENT sufficient quantities of Product to replace such Defective Product or damaged or destroyed Product, as applicable (the **"Production Rerun"**), in accordance with the provisions of this Agreement. If CLIENT requests a Production Rerun, then: (A) if CLIENT previously paid for such Defective Product or damaged or destroyed Product, the Production Rerun will be performed and the replacement Product will be provided at no additional cost to CLIENT; and (B) if CLIENT did not pay for such Defective Product or damaged or destroyed Product, CLIENT shall be responsible for the price of the conforming Batch of Product provided to CLIENT from the Production Rerun. If CLIENT previously paid for such Defective Product or damaged or destroyed Product, and CLIENT does not request a Production Rerun, then LHI will, at CLIENT's option, either credit or refund any amounts paid by CLIENT for such Defective Product or damaged or destroyed Product. [...***...].

5.5.2 In the event that the Parties agree, or an independent testing laboratory determines, pursuant to Section 5.4, that a Batch of Product or portion thereof constitutes Defective Product, or Product and/or Materials are destroyed or damaged by LHI Personnel, for any reason other than as set forth in Section 5.5.1, then LHI shall have no liability to CLIENT with respect to such Batch, Product or Material and LHI will, at CLIENT's request, produce for CLIENT a Production Rerun at CLIENT's expense. Notwithstanding anything to the contrary set forth in Section 5.5.1, if during the manufacture of Product pursuant to this Agreement, Product or Materials are destroyed or damaged by LHI Personnel while LHI Personnel were acting at the direction of CLIENT Personnel, then LHI will have no liability to CLIENT as the result of such destruction or damage.

5.5.3 Subject to this Section 5.5.3, CLIENT acknowledges and agrees that [...***...] with respect to (i) the failure of Product to conform with any of the Product Warranties and (ii) damaged or destroyed Materials and/or Product, including without limitation, Product containing Latent Defects, [...***...].

6. STORAGE OF MATERIALS

6.1 Pre-Production. LHI will store at the expense of CLIENT any CLIENT Materials, equipment or other property delivered pursuant to the applicable Statement of Work to the Facility by CLIENT for the performance of the applicable Process or the manufacture of Product. The storage rates will be set forth in the applicable Statement of Work and may be amended from time to time by LHI with prior written notice to CLIENT. No storage fees will be charged during the period starting 30 days prior to the Commencement Date and ending upon fifteen (15) days after the expiration or termination of the Production Term.

6.2 Post-Production. LHI will store at the Facility free of charge any in–process materials, CLIENT Materials, equipment and other CLIENT property (other than Product manufactured hereunder) that remains at the Facility on the date of expiration or termination of the Production Term (collectively **"Remaining CLIENT Property"**), for up to 15 calendar days. LHI shall provide CLIENT with a list of the Remaining CLIENT Property within 15 calendar days of the date of expiration or termination of the Production Term. If CLIENT has not provided any instructions as to the shipment or other disposition of Remaining CLIENT Property prior to the expiration of such fifteen (15)-day period, LHI may, in its sole discretion, destroy such Remaining CLIENT Property, or continue to store such Remaining CLIENT Property at the Facility or elsewhere. In the event that LHI continues to store such Remaining CLIENT Property, CLIENT will pay to LHI a storage charge at LHI's then-standard monthly storage rates for the period beginning on the sixteenth (16th) day after the expiration or termination of the Production Term through the date that the storage terminates.

6.3 Product. Notwithstanding the foregoing, if CLIENT fails to take delivery of a Product within the applicable Delivery Period as required by Section 4.4, CLIENT will pay to LHI a storage charge at three times LHI's then-standard monthly storage rate, which shall begin accruing on the first day following the expiration of the applicable Delivery Period.

7. REGULATORY MATTERS

7.1 Permits and Approvals. During the Production Term, LHI will use commercially reasonable efforts to maintain any licenses, permits and approvals necessary for the manufacture of the Product in the Facility. LHI will promptly notify CLIENT if LHI receives notice that any such license, permit, or approval is or may be revoked or suspended.

7.2 Inspections/Quality Audit by CLIENT. Up to two times during each year of the term of this Agreement, and upon not less than 30 days' prior written notice, CLIENT may inspect and audit the parts of the Facility where any activities conducted hereunder with respect to the Process or the manufacture of the Product are carried out in order to assess LHI's compliance with cGMP and other applicable practices or regulations, and to discuss any related

issues with LHI's management personnel. In addition to such semi-annual audits, CLIENT may audit the Facility on a "for cause" basis as often as is required. CLIENT Personnel engaged in such inspection will abide by the terms and conditions set forth in Sections 4.6.4 and 9.

7.3 Inspections by Regulatory Agencies. LHI will promptly notify CLIENT if any regulatory agency visits the Facility concerning the manufacture of the Product. LHI will allow representatives of any regulatory agency to inspect the relevant parts of the Facility where any activities conducted hereunder with respect to the manufacture of Product are carried out and to inspect the SOW Documentation and Batch Records to verify compliance with cGMP and other practices or regulations and will promptly notify CLIENT of the scheduling of any such inspection. LHI will promptly send to CLIENT a copy of any reports, citations, or warning letters received by LHI in connection with an inspection of a regulatory agency to the extent such documents relate to or affect the manufacture of the Product. CLIENT is permitted to be on site and available for questions regarding the Product during any such inspection. To the extent practicable, LHI shall furnish to CLIENT copies of proposed responses to any regulatory agency with respect to any such inspection to the extent such proposed responses are related to the Product or Process, subject to redaction of LHI's Confidential Information or other information of LHI that is unrelated to the Product or its manufacture, as promptly as reasonably possible prior to the time it submits such responses. Prior to responding, to the extent practicable, LHI will discuss the proposed response with CLIENT and will implement in good faith any comments provided by CLIENT relating to the Product which LHI deems applicable. After the filing of a response with any regulatory agency, LHI will notify CLIENT of any further written contacts with such regulatory agency relating to the subject matter of the response.

8. FINANCIAL TERMS

8.1 Payments. CLIENT will make payments to LHI in the amounts and on the dates set forth in the Statement of Work upon receipt of an invoice from LHI. In the event that CLIENT has not paid an invoice within thirty (30) business days of the applicable due date (as established by Section 8.2), CLIENT's failure shall be considered a material breach under Section 13.2, subject to the cure provisions set forth therein. Further, in addition to all other remedies available to LHI, in the event that CLIENT has not paid an undisputed invoice within sixty (60) business days of the applicable due date (as established by Section 8.2), LHI may elect to suspend the provision of all or a portion of the services under this Agreement, provided that CLIENT shall remain liable for all fees owed pursuant to the Statement of Work during any such suspension.

8.2 Invoices and Pricing. LHI will charge for the services in accordance with the price schedule in each individual Statement of Work. LHI will invoice CLIENT according to the schedule set forth in a Statement of Work. LHI will deliver invoices electronically by email, which shall be considered to be an original invoice. Invoices should be e-mailed to [...***...]@celladon.net and/or to such other e-mail address(es) as CLIENT may stipulate from time to time. LHI will not deliver a paper invoice. Payment of invoices is due as provided in the Statement of Work. All pricing excludes taxes and costs relating to shipping and regulatory filings. The price of Product manufactured outside of the United States shall be invoiced to

CLIENT in either the local currency of the location of the facility in which the Product is manufactured or such other currency mutually agreed by the Parties.

8.3 Taxes. CLIENT agrees that it is responsible for and will pay any sales, use or other taxes (the **"Taxes"**) resulting from LHI's production of Product under this Agreement (except for income or personal property taxes payable by LHI). To the extent not paid by CLIENT, CLIENT will indemnify and hold harmless the LHI Parties from and against any and all penalties, fees, expenses and costs whatsoever in connection with the failure by CLIENT to pay the Taxes. LHI will not collect any sales and use taxes from CLIENT in connection with the production of any Product hereunder if CLIENT provides to LHI the appropriate valid exemption certificates.

8.4 Interest. Any fee, charge or other payment due to LHI by CLIENT under this Agreement that is not paid within 30 days after it is due will accrue interest on a daily basis at a rate of 1.5% per month (or the maximum legal interest rate allowed by applicable law, if less) from and after such date.

8.5 Method of Payment. Except as otherwise set forth in Section 8.2, all payments to LHI hereunder by CLIENT will be in United States currency and will be by check, wire transfer, money order, or other method of payment approved by LHI. Bank information for wire transfers is as follows:

Mailing address for wire transfer payments:

To:	[...***...]
Branch:	[...***...]
	[...***...]
	[...***...]
Wire ABA Routing:	[...***...]
Check-ACH ABA:	[...***...]
Account:	[...***...]
Remarks:	[...***...]

8.6 Cost Adjustments. After the first anniversary of the Effective Date, LHI may annually adjust the various costs and rates set forth in the Statements of Work entered into by the Parties in the prior year to reflect changes in the cost of materials and/or labor rate paid by LHI in connection with the manufacture of Product under this Agreement; *provided*, *however*, that any increase in labor rates shall not exceed any percentage increase in the US Consumer Price Index for the most recently published percentage change for the 12-month period preceding the applicable contract anniversary date. LHI agrees to provide CLIENT with written notice of any such cost adjustment prior to such cost adjustment taking effect. In addition to the foregoing, the price may be changed by LHI, upon reasonable prior written notice to CLIENT (providing reasonable detail in support thereof), to reflect any material change in an environmental or regulatory standard that substantially impacts LHI's cost and ability to manufacture Product.

9. CONFIDENTIAL INFORMATION

9.1 Definition. "Confidential Information" means all technical, scientific and other know-how and information, trade secrets, knowledge, technology, means, methods, processes, practices, formulas, instructions, skills, techniques, procedures, specifications, data, results and other material, pre-clinical and clinical trial results, manufacturing procedures, test procedures and purification and isolation techniques, and any tangible embodiments of any of the foregoing, and any scientific, manufacturing, marketing and business plans, any financial and personnel matters relating to a Party or its present or future products, sales, suppliers, customers, employees, investors or business, that has been disclosed by or on behalf of such Party or such Party's Affiliates to the other Party or the other Party's Affiliates either in connection with the discussions and negotiations pertaining to this Agreement or in the course of performing this Agreement. Without limiting the foregoing, (a) all information that was disclosed by the Parties prior to the Effective Date pursuant to the Reciprocal Confidentiality Agreement entered into by the Parties dated November 30, 2010, as amended, will be considered "Confidential Information" hereunder, (b) the terms of this Agreement will be deemed "Confidential Information" of both Parties and will be subject to the terms and conditions set forth in this Article 9, and (c) all Processes provided by CLIENT hereunder, the Specifications and any Confidential Information solely related to Product will be deemed the "Confidential Information" of CLIENT and will be subject to the terms and conditions set forth in this Article 9.

9.2 Exclusions. Notwithstanding the foregoing Section 9.1, any information disclosed by a Party to the other Party will not be deemed "Confidential Information" of the disclosing Party to the extent that such information:

(a) at the time of disclosure is in the public domain;

(b) becomes part of the public domain, by publication or otherwise, through no fault of the Party receiving such information;

(c) at the time of disclosure is already in possession of the Party who received such information, as established by contemporaneous written records;

(d) is lawfully provided to the receiving Party, without restriction as to confidentiality or use, by a Third Party lawfully entitled to possession of such Confidential Information; or

(e) is independently developed by the receiving Party without use of or reference to the disclosing Party's Confidential Information, as established by contemporaneous written records.

9.3 Disclosure and Use Restriction. Except as expressly provided herein, the Parties agree that for the term of the Agreement and the ten-year period following any termination or expiration of the Agreement, each Party and its Affiliates will keep completely confidential and will not publish or otherwise disclose any Confidential Information of the other Party, its Affiliates or sublicensees, except in accordance with Section 9.4. Neither Party will use

Confidential Information of the other Party except as necessary to perform its obligations or to exercise its rights under this Agreement.

9.4 Permitted Disclosures. Each receiving Party agrees to (i) institute and maintain security procedures to identify and account for all copies of Confidential Information of the disclosing Party and (ii) limit disclosure of the disclosing Party's Confidential Information to its U.S. and European Affiliates and each of its and their respective officers, directors, employees, agents, consultants and independent contractors having a need to know such Confidential Information for purposes of this Agreement; provided that such U.S. and European Affiliates and each of its and their respective officers, directors, employees, agents, consultants and independent contractors are informed of the terms of this Agreement and are subject to obligations of confidentiality, non-disclosure and non-use at least as restrictive as those set forth herein.

9.5 Government-Required Disclosure. If a duly constituted government authority, court or regulatory agency orders that a Party hereto disclose information subject to an obligation of confidentiality under this Agreement, such Party shall comply with the order, notwithstanding the obligations of confidentiality or limitations on use in this Agreement, and shall notify the other Party as soon as reasonably possible, so as to provide such other Party an opportunity to apply to a court of record for relief from the order. The Party ordered to make such disclosure shall reasonably cooperate and assist such other Party to the extent necessary to obtain such relief from the order or obtain confidential treatment of the information disclosed.

9.6 Publicity. Neither Party will refer to, display or use the other's name, trademarks or trade names, including those confusingly similar thereto, alone or in conjunction with any other words or names, in any manner or connection whatsoever, including any publication, article, or any form of advertising or publicity, except with the prior written consent of the other Party. Notwithstanding the foregoing, for general business development purposes, LHI may announce on its website or in press releases the general nature of work performed for CLIENT under any given Statement of Work upon receiving permission from CLIENT, such permission not being unreasonably withheld or delayed.

10. INTELLECTUAL PROPERTY

10.1 Ownership.

10.1.1 Except as expressly otherwise provided herein, neither Party will, as a result of this Agreement, acquire any right, title, or interest in any Intellectual Property of the other Party. Except as expressly otherwise provided herein, ownership of any Intellectual Property that is developed, conceived, invented, first reduced to practice or made in connection with the performance under this Agreement shall follow inventorship all as determined under applicable laws.

10.1.2 As between the Parties, CLIENT shall own all right, title, and interest in and to any and all Intellectual Property that LHI and/or its Affiliates develops, conceives, invents, first reduces to practice or makes, solely or jointly with CLIENT or others in the course of or resulting from the performance of a Statement of Work (collectively, **"CLIENT New IP"**). Notwithstanding the foregoing, in the event that CLIENT agrees in writing to LHI's use of any

LHI Materials, LHI Background IP or LHI Confidential Information in accordance with Section 3.4, CLIENT New IP shall not include any Intellectual Property that is an improvement to or enhancement of, any LHI Materials, LHI Background IP and/or LHI Confidential Information (collectively, "LHI **Improvement IP"**). For clarity, LHI Improvement IP shall be limited to any Intellectual Property which the use or commercial exploitation by CLIENT of such Intellectual Property could not be practiced, used or commercially exploited without a license to LHI Background IP. CLIENT hereby assigns to LHI the right, title, and interest in and to any and all of such LHI Improvement IP.

10.1.3 On a Statement of Work-by-Statement of Work basis, LHI hereby assigns to CLIENT all of LHI's right, title and interest in and to all CLIENT New IP arising from the performance of each Statement of Work hereunder, subject to CLIENT's obligation to make all payments that become due under such Statement of Work. If CLIENT disputes whether a particular payment is due under a Statement of Work or disputes the amount of the payment due, CLIENT may, at its option, pay the disputed payment or amount to LHI without waiving or limiting CLIENT's right to dispute such payment or amount and/or to seek other remedies available under this Agreement, at law or in equity, provided that CLIENT provides notice of such dispute before or concurrently with payment of such disputed payment or amount. For the avoidance of doubt, upon payment in full of all amounts due under a particular Statement of Work (whether or not CLIENT disputes any amount paid thereunder), as between LHI and CLIENT, CLIENT shall be the exclusive owner of all right, title and interest to all CLIENT New IP that arose under such Statement of Work, and LHI's assignment to CLIENT of such CLIENT New IP shall be irrevocable and perpetual.

10.1.4 LHI shall promptly disclose to CLIENT in writing all CLIENT New IP. LHI shall execute, and shall require its personnel as well as its Affiliates, or other contractors or agents and their personnel involved in the performance of this Agreement to execute, any documents reasonably required to confirm CLIENT's ownership of CLIENT New IP, and any documents required to apply for, maintain and enforce any patent or other right in the CLIENT New IP.

10.1.5 As between the Parties, LHI shall own all right, title and interest in LHI Background IP, LHI Confidential Information and/or LHI Operating Documents.

10.2 License Grants.

10.2.1 During the term of this Agreement, CLIENT hereby grants to LHI a fully paid, non-exclusive license under any CLIENT Background IP and CLIENT New IP that is necessary for LHI to perform its obligations under this Agreement for the sole and limited purpose of LHI's performance of its obligations under this Agreement, including, without limitation, the development of the Process and the manufacture of Product for CLIENT. CLIENT further grants to LHI a fully paid, non-exclusive, non-transferable (except in connection with the assignment of this Agreement pursuant to Section 16.12), perpetual license, including the right to grant sublicenses, solely for contract manufacturing purposes and internal research and development, under CLIENT New IP to use, make, have made, sell, offer to sell and import any products [...***...]. For the removal of doubt, with respect to the license granted to LHI in

*****Confidential Treatment Requested**

the preceding sentence, LHI shall not have the right to grant sublicenses under the internal research and development portion of such license; *provided, however*, LHI shall have the right to grant sublicenses under such license for contract manufacturing purposes.

10.2.2 On a Statement of Work-by-Statement of Work basis, LHI hereby grants to CLIENT a non-exclusive, world-wide, fully paid-up, irrevocable, transferable license, including the right to grant sublicenses, under any and all Intellectual Property owned or Controlled by LHI (including without limitation LHI Background IP) that LHI incorporates into any Process that is performed under each Statement of Work hereunder, to make, have made, use, sell, offer for sale, have sold and import the Product, subject to the terms set forth in Section 3.4 above and CLIENT's obligation to make all payments that become due under such Statement of Work. If CLIENT disputes whether a particular payment is due under a Statement of Work or disputes the amount of the payment due, CLIENT may, at its option, pay the disputed payment or amount to LHI without waiving or limiting CLIENT's right to dispute such payment or amount and/or to seek other remedies available under this Agreement, at law or in equity, provided that CLIENT provides notice of such dispute before or concurrently with payment of such disputed payment or amount. For the avoidance of doubt, upon payment in full of all amounts due under a particular Statement of Work (whether or not CLIENT disputes any amount paid thereunder), the license granted to CLIENT under this Section 10.2.2 shall be irrevocable and perpetual.

10.3 Further Assurances. Each Party agrees to take all necessary and proper acts, and will cause its employees, Affiliates, contractors, and consultants to take such necessary and proper acts, to effectuate the assignment and ownership provisions set forth in this Article 10.

10.4 Prosecution of Patents.

10.4.1 LHI will have the sole right and discretion to file, prosecute and maintain patent applications and patents claiming LHI Background IP at LHI's expense.

10.4.2 CLIENT will have the sole right and discretion to file, prosecute and maintain patent applications and patents claiming CLIENT New IP at CLIENT's expense. LHI will cooperate with CLIENT to file, prosecute and maintain patent applications and patents claiming CLIENT New IP, and will have the right to review and provide comments to CLIENT relating to such patent applications and patents.

11. REPRESENTATIONS AND WARRANTIES

11.1 By CLIENT. CLIENT hereby represents and warrants to LHI that, to the best of its knowledge, (i) it has the requisite intellectual property and legal rights to provide CLIENT Deliverables, the Process, and the Product to LHI for use in the performance of LHI's obligations under the Statement(s) of Work, and (ii) the performance of the Statement of Work and the production by LHI of the Product as contemplated in this Agreement will not give rise to a potential cause of action by a Third Party against LHI for infringement or another violation of intellectual property rights. Such representation and warranty will not apply to any production equipment supplied by LHI.

11.2 By LHI. LHI hereby represents and warrants to CLIENT that, to the best of its knowledge, (i) it or its Affiliates have the requisite intellectual property rights in its equipment, Facility and its LHI Background IP to be able to perform its obligations under this Agreement, (ii) that LHI's or its Affiliates' use of its equipment, Facility, LHI Background IP and LHI Confidential Information as contemplated in this Agreement will not give rise to a potential cause of action by a Third Party against CLIENT for infringement or another violation of intellectual property rights. LHI further warrants and covenants to CLIENT that LHI will not use any employee or consultant that has been debarred by the FDA or EMA, or, to the best of its knowledge is subject of debarment proceedings by the FDA or EMA.

12. DISCLAIMER; LIMITATION OF LIABILITY

12.1 DISCLAIMER. EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT, NEITHER PARTY MAKES ANY REPRESENTATIONS AND GRANTS NO WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, WITH RESPECT TO THE PRODUCTS, MATERIALS, AND SERVICES PROVIDED UNDER THIS AGREEMENT, AND EACH PARTY SPECIFICALLY DISCLAIMS ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE WITH RESPECT TO SUCH PRODUCTS, MATERIALS, OR SERVICES.

12.2 Disclaimer of Consequential Damages. EXCEPT WITH RESPECT TO A BREACH OF ARTICLE 9 OR WITH RESPECT TO EACH PARTY'S INDEMNIFICATION RIGHTS UNDER ARTICLE 14, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER OR ANY OF ITS AFFILIATES FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS, BUSINESS OR GOODWILL) SUFFERED OR INCURRED BY SUCH OTHER PARTY OR ITS AFFILIATES IN CONNECTION WITH THIS AGREEMENT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

12.3 Limitation of Liability. BOTH PARTIES HEREBY AGREE THAT TO THE FULLEST EXTENT PERMITTED BY LAW, LHI'S LIABILITY TO CLIENT, FOR ANY AND ALL INJURIES, CLAIMS, LOSSES, EXPENSES, OR DAMAGES, WHATSOEVER, ARISING OUT OF OR IN ANY WAY RELATED TO THIS AGREEMENT FROM ANY CAUSE OR CAUSES, INCLUDING, BUT NOT LIMITED TO, NEGLIGENCE, ERRORS, OMISSIONS OR STRICT LIABILITY, SHALL NOT EXCEED THE AGGREGATE AMOUNT OF THE FEES PAID BY CLIENT UNDER THE APPLICABLE STATEMENT OF WORK GIVING RISE TO THE CLAIM DURING THE [...*...] MONTHS IMMEDIATELY PRECEDING THE EVENT GIVING RISE TO SUCH CLAIM FOR SUCH DAMAGES, AND LHI'S LIABILITY IN CONNECTION WITH A CLAIM THAT DOES NOT ARISE FROM A PARTICULAR STATEMENT OF WORK SHALL NOT EXCEED THE AGGREGATE AMOUNT OF THE FEES PAID BY CLIENT UNDER THIS AGREEMENT DURING THE [...***...]**

MONTHS IMMEDIATELY PRECEDING THE EVENT GIVING RISE TO THE CLAIM FOR SUCH DAMAGES; PROVIDED, HOWEVER, THAT SUCH LIMIT SHALL NOT APPLY TO LIABILITY ARISING FROM A BREACH OF ARTICLE 9 OR CLIENT'S CLAIM FOR INDEMNIFICATION FROM LHI PURSUANT TO SECTION 14.1. TO THE EXTENT THAT THIS CLAUSE CONFLICTS WITH ANY OTHER CLAUSE, THIS CLAUSE SHALL TAKE PRECEDENCE OVER SUCH CONFLICTING CLAUSE. IF APPLICABLE LAW PREVENTS ENFORCEMENT OF THIS CLAUSE, THEN THIS CLAUSE SHALL BE DEEMED MODIFIED TO PROVIDE THE MAXIMUM PROTECTION FOR LHI AS IS ALLOWABLE UNDER APPLICABLE LAW.

13. TERM AND TERMINATION

13.1 Term. The term of this Agreement will commence on the Effective Date and will continue until the fifth anniversary of the Effective Date unless terminated prior to that time or extended by the Parties.

13.2 Termination for Material Breach. Either Party may terminate this Agreement, by written notice to the other Party, for any material breach of this Agreement by the other Party, if such breach is not cured within thirty (30) days after the breaching Party receives written notice of such breach from the non-breaching Party; *provided, however,* that if such breach is not capable of being cured within such thirty-day period and the breaching Party has commenced and diligently continued actions to cure such breach within such thirty-day period, except in the case of a payment default, the cure period shall be extended to 180 days, so long as the breaching Party is making diligent efforts to cure such breach. Such termination shall be effective upon expiration of such cure period.

13.3 Termination by Notice.

13.3.1 Without Cause by CLIENT. After the first anniversary of the Effective Date, CLIENT may terminate this Agreement by providing written notice of termination no less than six months in advance of the date of termination. For the avoidance of doubt, in the event of termination by CLIENT under this Section 13.3.1, CLIENT shall, at minimum, remain liable for all fees owed pursuant to any outstanding Statement of Work during such six-month period.

13.3.2 Without Cause by LHI. LHI may terminate this Agreement by providing prior written notice of such termination to CLIENT, provided that, such termination shall not be effective until CLIENT has duly qualified an alternative supplier and a LHI Technology Transfer is completed, further provided that such period of qualification and LHI Technology Transfer shall not exceed twelve (12) months from the date of receipt by CLIENT of LHI's notice of termination.

13.3.3 Termination of Clinical Trials. Either Party may terminate this Agreement if such Party receives notice that the production of Product hereunder or the clinical trials for which Product is being produced hereunder have been or will be suspended or terminated by the FDA or EMA due to failure of the Product by providing written notice of termination not less than 2 months in advance of the date of termination. For the avoidance of doubt, in the event of termination by CLIENT under this Section 13.3.3, CLIENT shall remain

liable for all fees actually incurred for work conducted prior to the effective date of termination (including all un-cancellable labor commitments and all work in process including all professional services rendered through the effective date of termination), for any charges for materials that have already been purchased for the project and for any wind-down costs agreed by the Parties to be performed by LHI. LHI shall use commercially reasonable effort to mitigate any such fees or expenses.

13.4 Termination by Insolvency. Either Party may terminate this Agreement upon notice to the other Party, upon (a) the dissolution, termination of existence, liquidation or business failure of the other Party; (b) the appointment of a custodian or receiver for the other Party who has not been terminated or dismissed within ninety (90) days of such appointment; (c) the institution by the other Party of any proceeding under national, federal or state bankruptcy, reorganization, receivership or other similar laws affecting the rights of creditors generally or the making by such Party of a composition or any assignment for the benefit of creditors under any national, federal or state bankruptcy, reorganization, receivership or other similar law affecting the rights of creditors generally, which proceeding is not dismissed within ninety (90) days of filing. All rights and licenses granted pursuant to this Agreement are, and shall otherwise be deemed to be, for purposes of Section 365(n) of Title 11 of the United States Code, licenses of rights of "intellectual property" as defined therein.

13.5 Effects of Termination.

13.5.1 Accrued Rights. Termination of this Agreement for any reason will be without prejudice to any rights that will have accrued to the benefit of a Party prior to such termination. Such termination will not relieve a Party of obligations that are expressly indicated to survive the termination of this Agreement.

13.5.2 Disposition of Remaining CLIENT Property and Confidential Information. Upon termination or expiration of this Agreement, LHI will store any Remaining CLIENT Property as set forth in Section 6.2 and, at CLIENT's option, return or destroy any CLIENT Confidential Information in the possession or control of LHI. Likewise, CLIENT will, at LHI's option, return or destroy any LHI Confidential Information in the possession or control of CLIENT. Notwithstanding the foregoing provisions: (i) LHI may retain and preserve, in a secure manner, at its sole cost and expense, samples and standards of each Product following termination or expiration of this Agreement solely for use in determining LHI's rights and obligations hereunder and which shall remain subject to the obligations of non-use and confidentiality set forth in this Agreement; and (ii) each Party may retain a single copy of the other Party's Confidential Information for documentation purposes only and which shall remain subject to the obligations of nonuse and confidentiality set forth in this Agreement.

13.5.3 Survival. Sections 1, 3.4, 4.7, 6.2, 9, 10, 12, 13.5, 14, 15 and 16 of this Agreement will survive any expiration or termination of this Agreement.

14. INDEMNIFICATION

14.1 Indemnification of Client. LHI will indemnify CLIENT, its Affiliates, and their respective directors, officers, employees and agents, and defend and hold each of them harmless, from and against any and all losses, damages, liabilities, costs and expenses (including

reasonable attorneys' fees and expenses) in connection with any and all liability suits, investigations, claims or demands (collectively, **"Losses"**) to the extent such Losses arise out of or result from any claim, lawsuit or other action or threat by a Third Party arising out of: (a) any material breach by LHI of this Agreement, or (b) the gross negligence or willful misconduct on the part of one or more of the LHI Parties in performing any activity contemplated by this Agreement, except for those Losses for which CLIENT has an obligation to indemnify the LHI Parties pursuant to Section 14.2, as to which Losses each Party will indemnify the other to the extent of their respective liability for the Losses.

14.2 Indemnification of LHI. CLIENT will indemnify LHI and its Affiliates, and their respective directors, officers, employees and agents (the **"LHI Parties"**), and defend and hold each of them harmless, from and against any and all Losses to the extent such Losses arise out of or result from any claim, lawsuit or other action or threat by a Third Party arising out of: (a) any material breach by CLIENT of this Agreement, (b) the use or sale of Products (including any infringement of Third Party intellectual property rights), except to the extent such Losses arise out of or result from (i) a breach by LHI of the Product Warranties or (ii) the use or practice of LHI Materials, LHI Background IP or LHI Confidential Information, (c) the gross negligence or willful misconduct on the part of CLIENT or its Affiliates in performing any activity contemplated by this Agreement, or (d) the use or practice by LHI of any process, invention or other intellectual property supplied by CLIENT to LHI under this Agreement, except for those Losses for which LHI has an obligation to indemnify CLIENT pursuant to Section 14.1, as to which Losses each Party will indemnify the other to the extent of their respective liability for the Losses.

14.3 Indemnification Procedure.

14.3.1 An **"Indemnitor"** means the indemnifying Party. An **"Indemnitee"** means the indemnified Party, its Affiliates, and their respective directors, officers, employees and agents.

14.3.2 An Indemnitee which intends to claim indemnification under Section 14.1 or Section 14.2 hereof shall promptly notify the Indemnitor in writing of any claim, lawsuit or other action in respect of which the Indemnitee, its Affiliates, or any of their respective directors, officers, employees and agents intend to claim such indemnification. The Indemnitee shall permit, and shall cause its Affiliates and their respective directors, officers, employees and agents to permit, the Indemnitor, at its discretion, to settle any such claim, lawsuit or other action and agrees to the complete control of such defense or settlement by the Indemnitor; *provided*, *however*, that in order for the Indemnitor to exercise such rights, such settlement shall not adversely affect the Indemnitee's rights under this Agreement or impose any obligations on the Indemnitee in addition to those set forth herein. No such claim, lawsuit or other action shall be settled without the prior written consent of the Indemnitor and the Indemnitor shall not be responsible for any legal fees or other costs incurred other than as provided herein. The Indemnitee, its Affiliates and their respective directors, officers, employees and agents shall cooperate fully with the Indemnitor and its legal representatives in the investigation and defense of any claim, lawsuit or other action covered by this indemnification, all at the reasonable expense of the Indemnitor. The Indemnitee shall have the right, but not the obligation, to be represented by counsel of its own selection and expense.

14.4 Insurance. CLIENT will maintain, at all times during the clinical use (including any follow-up period as specified in the applicable clinical protocol) of Product manufactured by LHI under this Agreement, a products liability insurance policy (the **"Insurance Policy"**), with a per occurrence limit of at least five million dollars ($5,000,000) and an aggregate limit of at least five million dollars ($5,000,000), and will provide a Certificate of Insurance to LHI that the Insurance Policy has been endorsed to designate LHI as an additional insured. Notwithstanding the foregoing, if the Insurance Policy is a claims based policy, CLIENT shall maintain such Insurance Policy for an additional five year period after clinical use (including any follow-up period as specified in the applicable clinical protocol). CLIENT will maintain the Insurance Policy with an insurance company having a minimum AM Best rating of A and that is licensed to do business in the State of Maryland. CLIENT will provide LHI with at least 30 days' written notice prior to termination of such Insurance Policy.

15. ADDITIONAL COVENANTS

15.1 Non-Solicitation. During the term of this Agreement and for two (2) years thereafter, each of the Parties agrees not to seek to induce or solicit any employee of the other Party or its Affiliates to discontinue his or her employment with the other Party or its Affiliate in order to become an employee or an independent contractor of the soliciting Party or its Affiliate; *provided, however,* that neither Party shall be in violation of this Section 15.1 as a result of making a general solicitation for employees or independent contractors. For the avoidance of doubt, the publication of an advertisement shall not constitute solicitation or inducement.

15.2 Commercial Scale Manufacture. In the event that CLIENT desires to commence commercial scale manufacture of Product, the Parties agree to negotiate in good faith a definitive agreement for the provision of such manufacturing services to CLIENT by LHI (a **"Definitive Agreement"**). As of the Effective Date, the Parties outlined certain non-binding terms set forth in that certain Non-Binding Term Sheet by and between CLIENT and LHI dated July 6, 2012, and if CLIENT desires to commence commercial scale manufacture of Product, the Parties agree to further discuss and negotiate such non-binding terms in the course of negotiating in good faith a Definitive Agreement.

16. MISCELLANEOUS

16.1 Independent Contractors. Each of the Parties is an independent contractor and nothing herein contained shall be deemed to constitute the relationship of partners, joint venturers, nor of principal and agent between the Parties. Neither Party shall at any time enter into, incur, or hold itself out to Third Parties as having authority to enter into or incur, on behalf of the other Party, any commitment, expense, or liability whatsoever.

16.2 Force Majeure. Neither Party shall be in breach of this Agreement if there is any failure of performance under this Agreement (except for payment of any amounts due under this Agreement) occasioned by any reason beyond the control and without the fault or negligence of the Party affected thereby, including, without limitation, an act of God, fire, flood, act of government or state, war, civil commotion, insurrection, acts of terrorism, embargo, sabotage, prevention from or hindrance in obtaining energy or other utilities, a shortage of raw materials or other necessary components , labor disputes of whatever nature, or any other reason beyond the control and without the fault or negligence of the Party affected thereby (a **"Force Majeure**

Event”). Such excuse shall continue as long as the Force Majeure Event continues. Upon cessation of such Force Majeure Event, the affected Party shall promptly resume performance under this Agreement as soon as it is commercially reasonable for the Party to do so. Each Party agrees to give the other Party prompt written notice of the occurrence of any Force Majeure Event, the nature thereof, and the extent to which the affected Party will be unable to fully perform its obligations under this Agreement. Each Party further agrees to use commercially reasonable efforts to correct the Force Majeure Event as quickly as practicable (provided that in no event shall a Party be required to settle any labor dispute) and to give the other Party prompt written notice when it is again fully able to perform such obligations. In the event that a Force Majeure Event continues for more than one hundred eighty (180) consecutive days, the Party not affected by such Force Majeure Event shall have the right to terminate this Agreement upon written notice to the other Party.

16.3 Condemnation. If the Facility is condemned or taken as a result of the exercise of the power of eminent domain or will be conveyed to a governmental agency having power of eminent domain under the threat of the exercise of such power (any of the foregoing, a “Condemnation”), then this Agreement will terminate as of the date on which title to the Facility vests in the authority so exercising or threatening to exercise such power and CLIENT will not have any right to the Condemnation proceeds.

16.4 Notices. Any notice required or permitted to be given under this Agreement by any Party shall be in writing and shall be (a) delivered personally, (b) sent by registered mail, return receipt requested, postage prepaid, (c) sent by a nationally-recognized courier service guaranteeing next-day or second day delivery, charges prepaid, or (d) delivered by facsimile (with documented evidence of transmission), to the addresses or facsimile numbers of the other Party set forth below, or at such other addresses as may from time to time be furnished by similar notice by any Party. The effective date of any notice under this Agreement shall be the date of receipt by the receiving Party.

If to LHI:
Lonza Houston, Inc.
Attn: Business Head
8066 El Rio St.
Houston, TX 77056
E-mail: [...***...]@lonza.com

With a copy to:
Assistant General Counsel
Lonza America, Inc.
90 Boroline Road
Allendale, NJ 07401
Fax: (201) 378-5630

If to Client:
Celladon Corporation
Attn: Rebecque Laba, VP Finance and Administration
12760 High Bluff Drive, Suite 240
San Diego, CA 92130-2019
Fax: (858) 964-0974

Either Party may change its address for notice by giving notice thereof in the manner set forth in this Section 16.4.

16.5 Entire Agreement; Amendments. This Agreement, together with the Quality Agreement, all SOWs entered into pursuant to the Original MSA prior to the Restatement Date, and that certain letter agreement between the Parties dated as of the Restatement Date, constitutes the full understanding of the Parties and a complete and exclusive statement of the terms of their agreement with respect to the specific subject matter hereof and supersedes all prior agreements and understandings, oral and written, among the Parties with respect to the subject matter hereof or thereof, including, without limitation, the Original MSA. All SOWs entered into pursuant to the Original MSA prior to the Restatement Date shall be deemed to have been entered into pursuant to this Agreement and shall be subject in all respects to the terms and conditions of this Agreement, and all other events and activities that occurred prior to the Restatement Date under, or pursuant to, or that were subject to, the Original MSA shall be deemed to have occurred under and pursuant to, and to have been subject to, this Agreement. No terms, conditions, understandings or agreements purporting to amend, modify or vary the terms of this Agreement or any SOW shall be binding unless hereafter made in a written instrument referencing this Agreement and signed by each of the Parties.

16.6 Governing Law. The construction, validity and performance of the Agreement shall be governed by and construed in accordance with the internal laws of the State of Delaware, without giving effect to its conflicts of laws provisions.

16.7 Counterparts. This Agreement and any amendment hereto may be executed in any number of counterparts, each of which shall for all purposes be deemed an original and all of which shall constitute the same instrument. This Agreement shall be effective upon full execution by facsimile or original, and a facsimile signature shall be deemed to be and shall be as effective as an original signature.

16.8 Severability. If any part of this Agreement shall be found to be invalid or unenforceable under applicable law in any jurisdiction, such part shall be ineffective only to the extent of such invalidity or unenforceability in such jurisdiction, without in any way affecting the remaining parts of this Agreement in that jurisdiction or the validity or enforceability of the Agreement as a whole in any other jurisdiction. In addition, the part that is ineffective shall be reformed in a mutually agreeable manner so as to as nearly approximate the intent of the Parties as possible.

16.9 Titles and Subtitles. All headings, titles and subtitles used in this Agreement or any SOW are for convenience only and are not to be considered in construing or interpreting any term or provision of this Agreement or any SOW.

16.10 Recitals. All "RECITALS" set forth on the first page of this Agreement form an integral part of this Agreement and are incorporated into this Agreement by this reference.

16.11 Pronouns. Where the context requires, (i) all pronouns used herein will be deemed to refer to the masculine, feminine or neuter gender as the context requires, and (ii) the singular context will include the plural and vice versa.

16.12 Assignment. This Agreement shall be binding upon the successors and assigns of the Parties and the name of a Party appearing herein shall be deemed to include the names of its successors and assigns. Neither Party may assign its interest under this Agreement without the prior written consent of the other Party, such consent not to be unreasonably withheld; *provided*, *however*, that either Party may assign this Agreement to an Affiliate of such Party provided that the assigning Party guarantees the obligations, including all payment obligations, of the assignee; and provided, further, that either Party may assign this Agreement to a successor in interest by way of merger, acquisition, consolidation, or sale of all or substantially all of the business of such Party to which this Agreement relates, provided that in the event that CLIENT merges, is acquired, consolidates or sells all or substantially all of its business to which this Agreement relates, such successor in interest is not an entity whose business primarily derives from providing contract manufacturing services. Any permitted assignment of this Agreement by either Party will be conditioned upon that Party's permitted assignee agreeing in writing to comply with all the terms and conditions contained in this Agreement. Any purported assignment without a required consent shall be void. No assignment shall relieve any Party of responsibility for the performance of any obligation that accrued prior to the effective date of such assignment.

16.13 Waiver. The failure of any Party at any time or times to require performance of any provision of this Agreement or any SOW will in no manner affect its rights at a later time to enforce the same. No waiver by any Party of any term, provision or condition contained in this Agreement or any SOW, whether by conduct or otherwise, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any such term, provision or condition or of any other term, provision or condition of this Agreement or any SOW.

16.14 Dispute Resolution. Other than disputes under Section 5.4, if the Parties are unable to resolve a dispute, despite its good faith efforts, either Party may refer the dispute to the President of each Party's respective business unit (or other designee). In the event that no agreement is reached by the Presidents (or other designee of its President) with respect to such dispute within thirty (30) days after its referral to them, either Party may pursue any and all remedies available at law or in equity.

16.15 No Presumption Against Drafter. For purposes of this Agreement, each Party hereby waives any rule of construction that requires that ambiguities in this Agreement or any SOW be construed against the drafter.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date last signed by the parties hereto.

CELLADON CORPORATION

August 26, 2013
Date

By: /s/ Krisztina M. Zsebo
Name: Krisztina M. Zsebo, PhD
Title: President & CEO

LONZA HOUSTON, INC.

August 26, 2013
Date

By: /s/ J. David Enloe, Jr.
Name: J. David Enloe, Jr.
Title: Head, Viral-based Therapeutics