CATABASIS PHARMACEUTICALS INC
Form PRE 14A
October 12, 2018

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

SCHEDULE 14A

Proxy Statement Pursuant to Section 14(a) of
the Securities Exchange Act of 1934 (Amendment No.)

Filed by the Registrant ý

Filed by a Party other than the Registrant o

Check the appropriate box:

ý Preliminary Proxy Statement

o **Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))**

o Definitive Proxy Statement

o Definitive Additional Materials

o Soliciting Material under §240.14a-12

CATABASIS PHARMACEUTICALS, INC.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement, if other than the Registrant)

Payment of Filing Fee (Check the appropriate box):

ý No fee required.

o Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.
(1) Title of each class of securities to which transaction applies:

(2) Aggregate number of securities to which transaction applies:

(3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):

(4) Proposed maximum aggregate value of transaction:

(5)

Total fee paid:

o Fee paid previously with preliminary materials.

o Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a)(2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.

(1) Amount Previously Paid:

(2) Form, Schedule or Registration Statement No.:

(3) Filing Party:

(4) Date Filed:

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[PRELIMINARY COPY SUBJECT TO COMPLETION]

CATABASIS PHARMACEUTICALS, INC.

One Kendall Square
Building 1400E, Suite B14202
Cambridge, MA 02139

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS
To be held on December 12, 2018

You are cordially invited to attend the Special Meeting of Stockholders (the "***Special Meeting***") of Catabasis Pharmaceuticals, Inc. scheduled to be held on Wednesday, December 12, 2018.

At the Special Meeting, the stockholders will consider and vote on the following matters:

1. To approve an amendment to our certificate of incorporation to effect a reverse stock split at a ratio not less than 1-for-5 and not greater than 1-for-15, with the exact ratio to be set within that range at the discretion of our board of directors before June 30, 2019 without further approval or authorization of our stockholders and with our board of directors able elect to abandon such proposed amendment and not effect the reverse stock split authorized by stockholders, in its sole discretion (the "***Reverse Split Proposal***");

2. To approve an amendment and restatement of our 2015 Stock Incentive Plan to increase the number of shares available for issuance thereunder by 8,500,000 shares on a pre-split basis and to provide for certain other amendments (the "***Plan Amendment Proposal***"); and

3. To transact any other business properly brought before the Special Meeting or any adjournment or postponement thereof.

We are pleased to take advantage of the Securities and Exchange Commission rules that allow us to furnish proxy materials to our stockholders on the internet.

The proxy statement for the Special Meeting was first mailed to our stockholders on or about October [29], 2018.

The board of directors unanimously believes that (i) the Reverse Split Proposal and (ii) the Plan Amendment Proposal are in our company's best interests and those of our stockholders. Accordingly, our board of directors recommends a vote (i) FOR the Reverse Split Proposal and (ii) FOR the Plan Amendment Proposal, as outlined in the attached Proxy Statement.

Stockholders of record at the close of business on October 19, 2018, the record date for the Special Meeting, are entitled to notice of, and to vote at, the Special Meeting or any adjournment or postponement of the Special Meeting. Whether or not you expect to attend the Special Meeting in person, please vote your shares by proxy as promptly as possible to ensure your representation and the presence of a quorum at the Special Meeting. In addition to returning your proxy card by mail, you may vote your shares on the internet by visiting www.proxyvote.com or by telephone by calling 800-690-6903 and following the recorded instructions. Your vote is important regardless of the number of shares you own. If you send in your proxy card or vote by telephone or the internet and then decide to attend the Special Meeting to vote your shares in person, you may still do so. Your proxy is revocable in accordance with the procedures set forth in the Proxy Statement.

If your shares are held in "street name," that is, held for your account by a broker or other nominee, you will receive instructions from the holder of record that you must follow for your shares to be voted.

By order of the Board of Directors,

Jill C. Milne, Ph.D.
President and Chief Executive Officer

Cambridge, Massachusetts
October [ ], 2018

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[PRELIMINARY COPY SUBJECT TO COMPLETION]

CATABASIS PHARMACEUTICALS, INC.

One Kendall Square
Building 1400E, Suite B14202
Cambridge, MA 02139
617-349-1971

PROXY STATEMENT

FOR THE SPECIAL MEETING OF STOCKHOLDERS
to be held on December 12, 2018

This proxy statement and the proxy card contain information about the Special Meeting of Stockholders of Catabasis Pharmaceuticals, Inc. (the "***Special Meeting***") to be held on Wednesday, December 12, 2018 at 10:00 a.m. Eastern Time, at the offices of WilmerHale located at 60 State Street, Boston, Massachusetts 02109. The board of directors of Catabasis Pharmaceuticals, Inc. is using this proxy statement to solicit proxies for use at the Special Meeting. In this proxy statement, unless expressly stated otherwise or the context otherwise requires, the use of "Catabasis," "our," "we" or "us" refers to Catabasis Pharmaceuticals, Inc.

All properly submitted proxies will be voted in accordance with the instructions contained in those proxies. If no instructions are specified, the proxies will be voted in accordance with the recommendation of our board of directors with respect to each of the matters set forth in the accompanying Notice of Meeting. You may revoke your proxy at any time before it is exercised at the meeting by giving our corporate secretary written notice to that effect.

This proxy statement and proxy card are first being made available to stockholders on or about October [29], 2018.

Important Notice Regarding the Availability of Proxy Materials for
the Special Meeting of Stockholders to be Held on December 12, 2018:

The notice of the Special Meeting and this proxy statement are
available for viewing, printing and downloading at www.proxyvote.com.

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IMPORTANT INFORMATION ABOUT THE SPECIAL MEETING AND VOTING

Purpose of the Special Meeting

At the Special Meeting, our stockholders will consider and vote on the following matters:

1. To approve an amendment to our certificate of incorporation to effect a reverse stock split at a ratio not less than 1-for-5 and not greater than 1-for-15, with the exact ratio to be set within that range at the discretion of our board of directors before June 30, 2019 without further approval or authorization of our stockholders, and with our board of directors able elect to abandon such proposed amendment and not effect the reverse stock split authorized by stockholders, in its sole discretion (the "***Reverse Split Proposal***");

2. To approve an amendment and restatement of our 2015 Stock Incentive Plan to increase the number of shares available for issuance thereunder by 8,500,000 shares on a pre-split basis and to provide for certain other amendments (the "***Plan Amendment Proposal***"); and

3. To transact any other business properly brought before the Special Meeting or any adjournment or postponement thereof.

As of the date of this proxy statement, we are not aware of any business to come before the meeting other than the first two items noted above.

Board of Directors Recommendation

Our board of directors unanimously recommends that you vote:

FOR the **Reverse Stock Split Proposal**; and

FOR the **Plan Amendment Proposal**.

Notice of Internet Availability of Proxy Materials

Pursuant to rules adopted by the Securities and Exchange Commission (the "***SEC***"), we have elected to provide access to our proxy materials via the internet. Accordingly, we are sending a notice of internet availability of proxy materials to our stockholders. All stockholders will have the ability to access the proxy materials on the website referenced in the notice and to request to receive a printed set of the proxy materials by mail. Instructions on how to access the proxy materials over the internet and how to request a printed copy may be found in the notice. In addition, stockholders may request to receive proxy materials in printed form by mail or electronically by email on an ongoing basis. We encourage stockholders to take advantage of the availability of the proxy materials on the internet or through email to help reduce the environmental impact of our special and annual meetings. The proxy materials, including the notice of the Special Meeting, this proxy statement and a proxy card or voting instruction card are also available for viewing, printing and downloading on the internet at www.proxyvote.com.

Who Can Vote at the Special Meeting

Only stockholders of record at the close of business on the record date of October 19, 2018 are entitled to receive notice of the Special Meeting and to vote the shares of our common stock that they held on that date. As of October 19, 2018, there were [ ] shares of common stock issued and outstanding. Each share of common stock is entitled to one vote on each matter properly brought before the Special Meeting.

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Difference Between a "Stockholder of Record" and a Beneficial Owner of Shares Held in "Street Name"

Stockholder of Record. If you have shares registered directly in your name with our transfer agent, American Stock Transfer & Trust Company, LLC, then you are considered a "stockholder of record" of those shares. For these shares, your set of proxy materials has been made available to you directly by us. You may vote these shares by proxy prior to the Special Meeting by following the instructions contained on the proxy card.

Beneficial Owner of Shares Held in Street Name. If you hold shares in a brokerage account or by a bank, trust or other nominee or custodian, then you are considered the beneficial owner of those shares, which are held in "street name." For these shares, your set of proxy materials has been made available to you by that organization. The organization holding your account is considered the stockholder of record for purposes of voting at the Special Meeting. As the beneficial owner, you have the right to instruct that organization as to how to vote the shares held in your account by following the instructions contained on the voting instruction card provided to you by that organization.

How to Vote

Stockholder of Record. If you are a stockholder of record, you can vote your shares in one of two ways: either by proxy or in person at the Special Meeting. If you choose to vote by proxy, you may do so by telephone, via the internet or by mail. Each of these methods is explained below.

By Telephone. If you request printed copies of the proxy materials by mail and you live in the United States or Canada, you may vote by proxy by calling the toll free number found on the proxy card. You must have the control number that is on the proxy card when voting. If you choose to vote by telephone, you do not have to return the proxy card.

By Internet. You may transmit your proxy voting instructions via the internet by following the instructions provided on the notice of internet availability of proxy materials or the proxy card. You will need to have the control number that is on the proxy card when voting. If you choose to vote via the internet, you do not have to return the proxy card.

By Mail. If you request printed copies of the proxy materials by mail, you may vote by proxy by completing, signing and dating the proxy card and returning it in the envelope provided.

In Person at the Special Meeting. You may vote in person at the Special Meeting. We will give you a ballot when you arrive. Even if you plan to attend the Special Meeting, we urge you to vote your shares by proxy in advance of the Special Meeting so that, if you should become unable to attend the Special Meeting, your shares will be voted as directed by you.

Telephone and internet voting for stockholders of record will be available up until 11:59 p.m. Eastern Time on December 11, 2018, and mailed proxy cards must be received by December 11, 2018 in order to be counted at the Special Meeting. If the Special Meeting is adjourned or postponed, these deadlines may be extended.

Beneficial Owner of Shares Held in Street Name. If your shares are held in street name:

By Telephone or Internet. You will receive instructions or a voting instruction form from your broker or other nominee if you are permitted to vote by telephone or internet.

By Mail. You will receive instructions from your broker or other nominee explaining how to vote your shares by mail.

In Person at the Special Meeting. If you attend the Special Meeting, you may vote in person. To do so, you will need to show a picture identification as well as an account statement or a letter from the record holder indicating that you owned the shares as of the record date, and obtain

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from the broker or other nominee who holds your shares a legal proxy or broker's proxy card and bring it with you to the meeting.

The voting deadlines and availability of telephone and internet voting for beneficial owners of shares held in "street name" will depend on the voting processes of the organization that holds your shares. Therefore, we urge you to carefully review and follow the voting instruction card and any other materials that you receive from that organization.

If you hold your shares of Catabasis common stock in multiple accounts, you should vote your shares as described in each set of proxy materials you receive.

Quorum

A quorum of stockholders is necessary to hold a valid meeting. Our bylaws provide that a quorum will exist if stockholders holding a majority of the shares of stock issued and outstanding and entitled to vote are present at the meeting in person or by proxy. Abstentions and broker non-votes count as present for establishing a quorum but will not be counted as votes cast. Broker non-votes occur when your broker or other nominee submits a proxy for your shares (because the broker or other nominee has received instructions from you on one or more proposals, but not all, or has not received instructions from you but is entitled to vote on a particular "discretionary" matter) but does not indicate a vote for a particular proposal because the broker or other nominee either does not have the authority to vote on that proposal and has not received voting instructions from you or has discretionary authority but chooses not to exercise it. If a quorum is not present, the meeting may be adjourned until a quorum is obtained.

Ballot Measures Considered "Routine" and "Non-Routine"

The **Reverse Stock Split Proposal** (Proposal No. 1) is a matter considered routine under applicable rules. A broker or other nominee may generally exercise discretionary authority and vote on routine matters. If they exercise this discretionary authority, no broker non-votes are expected to exist in connection with Proposal No. 1.

The **Plan Amendment Proposal** (Proposal No. 2) is a matter considered non-routine under applicable rules. A broker or other nominee cannot vote without instructions on non-routine matters, and therefore there may be broker non-votes on Proposal No. 2.

Votes Required to Approve Reverse Stock Split Proposal and Plan Amendment Proposal

The approval of the Reverse Stock Split Proposal requires the holders of a majority of our outstanding shares of common stock to vote "FOR" such proposal (Proposal No. 1), and broker non-votes and abstentions (shares present at the meeting and voted "ABSTAIN") will have the effect of a vote "AGAINST" this proposal.

The approval of the Plan Amendment Proposal requires the affirmative vote of a majority of the votes cast at the Special Meeting (Proposal No. 2). Abstentions and broker non-votes will have no effect on the outcome of the vote on this proposal.

Method of Counting Votes

Each holder of common stock is entitled to one vote at the Special Meeting on each matter to come before the Special Meeting for each share held by such stockholder as of the record date. Votes cast in person at the Special Meeting or by proxy by mail, via the internet or by telephone will be tabulated by the inspector of election appointed for the Special Meeting, who will also determine whether a quorum is present.

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Revoking a Proxy; Changing Your Vote

If you are a stockholder of record, you may revoke your proxy before the vote is taken at the meeting:

by submitting a new proxy with a later date before the applicable deadline either signed and returned by mail or transmitted using the telephone or internet voting procedures described in the "How to Vote" section above;

by voting in person at the meeting; or

by filing a written revocation with our corporate secretary.

If your shares are held in street name, you may submit new voting instructions by contacting your broker or other organization holding your account. You may also vote in person at the Special Meeting, which will have the effect of revoking any previously submitted voting instructions, if you obtain a legal proxy from the organization that holds your shares as described in the "How to Vote" section above.

Your attendance at the Special Meeting will not automatically revoke your proxy.

Costs of Proxy Solicitation

We will bear the costs of soliciting proxies. In addition to solicitations by mail, our directors, officers and regular employees, without additional remuneration, may solicit proxies by telephone, facsimile, email, personal interviews and other means. In addition, we have hired Morrow Sodali LLC, 470 West Ave., Stamford, CT 06902 to aid us in the solicitation of proxies for a fee of $7,500 plus out-of-pocket expenses.

Voting Results

We plan to announce preliminary voting results at the Special Meeting and to publish final results in a Current Report on Form 8-K to be filed with the SEC within four business days following the Special Meeting.

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PROPOSAL NO. 1

TO APPROVE AN AMENDMENT TO OUR CERTIFICATE OF INCORPORATION TO EFFECT A REVERSE STOCK SPLIT

General

On September 21, 2018, our board of directors unanimously approved, subject to stockholder approval, an amendment to our certificate of incorporation to effect a reverse stock split of our outstanding common stock by combining outstanding shares of common stock into a lesser number of outstanding shares of common stock by a ratio of not less than 1-for-5 and not more than 1-for-15 at any time prior to June 30, 2019, with the exact ratio to be set within this range by our board of directors at its sole discretion (the "***Reverse Stock Split***"). The board of directors may alternatively elect to abandon such proposed amendment and not effect the Reverse Stock Split authorized by stockholders, in its sole discretion. Upon the effectiveness of the amendment to our certificate of incorporation effecting the Reverse Stock Split, the outstanding shares of our common stock will be reclassified and combined into a lesser number of shares such that one share of our common stock will be issued for a specified number of shares in accordance with the ratio for the Reverse Stock Split selected by our board of directors.

If this Proposal No. 1 is approved by our stockholders as proposed, our board of directors would have the sole discretion to effect the amendment and Reverse Stock Split at any time prior to June 30, 2019, and to fix the specific ratio for the Reverse Stock Split, provided that the ratio would be not less than 1-for-5 and not more than 1-for-15. We believe that enabling our board of directors to fix the specific ratio of the Reverse Stock Split within the stated range will provide us with the flexibility to implement the split in a manner designed to maximize the anticipated benefits for our stockholders. The determination of the ratio of the Reverse Stock Split will be based on a number of factors, described further below under the heading " Criteria to be Used for Decision to Apply the Reverse Stock Split."

The Reverse Stock Split, if approved by our stockholders, would become effective upon the filing of an amendment to our certificate of incorporation with the Secretary of State of the State of Delaware. The exact timing of the amendment will be determined by our board of directors based on its evaluation as to when such action will be the most advantageous to us and our stockholders, but the amendment will not occur after June 30, 2019. In addition, our board of directors reserves the right, notwithstanding stockholder approval and without further action by our stockholders, to abandon the amendment and the Reverse Stock Split if, at any time prior to the effectiveness of the filing of the certificate of amendment with the Secretary of State, our board of directors, in its sole discretion, determines that it is no longer in our best interest and the best interests of our stockholders to proceed.

The primary purpose for effecting the Reverse Stock Split is to increase the per share trading price of our common stock so as to:

- maintain the listing of our common stock on The Nasdaq Stock Market ("***Nasdaq***") and avoid a delisting of our common stock from Nasdaq in the future;
- broaden the pool of investors that may be interested in investing in our company by attracting new investors who would prefer not to invest in shares that trade at lower share prices; and
- make our common stock a more attractive investment to institutional investors.

In evaluating the Reverse Stock Split, our board of directors has taken, and will take, into consideration negative factors associated with reverse stock splits. These factors include the negative perception of reverse stock splits held by many investors, analysts and other stock market participants, as well as the fact that the stock price of some companies that have effected reverse stock splits has

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subsequently declined back to pre-reverse stock split levels. In approving the amendment to our certificate of incorporation for the Reverse Stock Split, our board of directors determined that these potential negative factors were significantly outweighed by the potential benefits.

The form of the proposed amendment to our certificate of incorporation to effect the Reverse Stock Split is attached as *Appendix A* to this proxy statement. Any amendment to our certificate of incorporation to effect the Reverse Stock Split will include the Reverse Stock Split ratio fixed by our board of directors, within the range approved by our stockholders.

Criteria to be Used for Decision to Apply the Reverse Stock Split

If our stockholders approve the Reverse Stock Split, our board of directors will be authorized to proceed with the Reverse Stock Split. The exact ratio of the Reverse Stock Split, within the 1-for-5 to 1-for-15 range, would be determined by our board of directors and publicly announced by us prior to the effective time of the Reverse Stock Split. In determining whether to proceed with the reverse split and setting the appropriate ratio for the Reverse Stock Split, our board of directors will consider, among other things, factors such as:

- Nasdaq's minimum price per share requirements;
- the historical trading prices and trading volume of our common stock;
- the number of shares of our common stock outstanding;
- the then-prevailing and expected trading prices and trading volume of our common stock and the anticipated impact of the Reverse Stock Split on the trading market for our common stock;
- the anticipated impact of a particular ratio on our ability to reduce administrative and transactional costs;
- business developments affecting us; and
- prevailing general market and economic conditions.

Reasons for the Reverse Stock Split

Our board of directors authorized the Reverse Stock Split with the primary intent of increasing the price of our common stock in order to meet the price criteria for continued listing on Nasdaq. Our common stock is publicly traded and listed on the Nasdaq Global Market under the symbol "CATB." Our board of directors believes that, in addition to increasing the price of our common stock to meet the price criteria for continued listing on Nasdaq, the Reverse Stock Split would also make our common stock more attractive to a broader range of institutional and other investors. Accordingly, for these and other reasons discussed below, we believe that effecting the Reverse Stock Split is in our and our stockholders' best interests.

On August 3, 2018, we received a deficiency letter from the Listing Qualifications Department (the "***Staff***") of Nasdaq, notifying us that, for the previous 30 consecutive business days, the bid price for our common stock had closed below the minimum $1.00 per share requirement for continued inclusion on the Nasdaq Global Market pursuant to Nasdaq Listing Rule 5450(a)(1) (the "***Bid Price Rule***"). In accordance with Nasdaq Listing Rule 5810(c)(3)(A) (the "***Compliance Period Rule***"), we have been provided an initial period of 180 calendar days, or until January 30, 2019 (the "***Compliance Date***"), to regain compliance with the Bid Price Rule. If, at any time before the Compliance Date, the bid price for our common stock closes at $1.00 or more for a minimum of 10 consecutive business days as required under the Compliance Period Rule, the Staff will provide written notification to us that it complies with the Bid Price Rule, unless the Staff exercises its discretion to extend this 10 day period pursuant to Nasdaq Listing Rule 5810(c)(3)(F).

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If we do not regain compliance with the Bid Price Rule by the Compliance Date, we may be eligible for an additional 180 calendar day compliance period. To qualify, we would need to transfer the listing of our common stock to the Nasdaq Capital Market, provided that we meet the continued listing requirement for the market value of publicly held shares and all other initial listing standards, with the exception of the bid price requirement. To effect such a transfer, we would also need to pay an application fee to Nasdaq and provide written notice to the Staff of our intention to cure the deficiency during the additional compliance period.

If we do not regain compliance with the Bid Price Rule by the Compliance Date and we are not eligible for an additional compliance period at that time, the Staff will provide written notification to us that our common stock may be delisted. At that time, we may appeal the Staff's delisting determination to a Nasdaq Listing Qualifications Panel (the "***Panel***"). We expect that our common stock would remain listed pending the Panel's decision. There can be no assurance that, if we do appeal the delisting determination by the Staff to the Panel, such appeal would be successful.

In the event we are delisted from Nasdaq, the only established trading market for our common stock would be eliminated and we would be forced to list our shares on the OTC Markets or another quotation medium, depending on our ability to meet the specific listing requirements of those quotation systems. As a result, an investor would likely find it more difficult to trade, or to obtain accurate price quotations for, our shares. Delisting would likely also reduce the visibility, liquidity and value of our common stock, including as a result of reduced institutional investor interest in our company, and may increase the volatility of our common stock. Delisting could also cause a loss of confidence of potential industry partners, lenders and employees, which could further harm our business and our future prospects. We believe that effecting the Reverse Stock Split may help us avoid delisting from Nasdaq and any resulting consequences.

In addition, our board of directors believes that an increased stock price could encourage investor interest and improve the marketability of our common stock to a broader range of investors, and thus enhance our liquidity. Because of the trading volatility often associated with low-priced stocks, many brokerage firms and institutional investors have internal policies and practices that either prohibit them from investing in low-priced stocks or tend to discourage individual brokers from recommending low-priced stocks to their customers. Additionally, because brokers' commissions on low-priced stocks generally represent a higher percentage of the stock price than commissions on higher-priced stock, the current share price of our common stock may result in an investor paying transaction costs that represent a higher percentage of total share value than would be the case if our share price were higher. Our board of directors believes that the higher share price that may result from the Reverse Stock Split could enable institutional investors and brokerage firms with such policies and practices to invest in our common stock.

Although we expect that the Reverse Stock Split will result in an increase in the market price of our common stock, the Reverse Stock Split may not result in a permanent increase in the market price of our common stock, which would be dependent on many factors, including general economic, market and industry conditions and other factors detailed from time to time in the reports we file with the SEC.

Certain Risks Associated with the Reverse Stock Split

There can be no assurance that the total market capitalization of our common stock after the implementation of the Reverse Stock Split will be equal to or greater than the total market capitalization before the Reverse Stock Split or that the per share market price of our common stock following the Reverse Stock Split will increase in proportion to the reduction in the number of shares of our common stock outstanding in connection with the Reverse Stock Split. Also, we cannot assure you that the Reverse Stock Split would lead to a sustained increase in the trading price of our common

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stock. The trading price of our common stock may change due to a variety of other factors, including our ability to successfully accomplish our business goals, market conditions and the market perception of our business. You should also keep in mind that the implementation of a reverse stock split does not have an effect on the actual or intrinsic value of our business or a stockholder's proportional ownership in our company. However, should the overall value of our common stock decline after the proposed Reverse Stock Split, then the actual or intrinsic value of the shares of our common stock held by you will also proportionately decrease as a result of the overall decline in value.

Further, the liquidity of our common stock may be harmed by the proposed Reverse Stock Split given the reduced number of shares that would be outstanding after the Reverse Stock Split, particularly if the expected increase in stock price as a result of the Reverse Stock Split is not sustained. In addition, the proposed Reverse Stock Split may increase the number of stockholders who own odd lots (less than 100 shares) of our common stock, creating the potential for such stockholders to experience an increase in the cost of selling their shares and greater difficulty effecting sales. If we effect the Reverse Stock Split, the resulting per-share stock price may nevertheless fail to attract institutional investors and may not satisfy the investing guidelines of such investors and, consequently, the trading liquidity of our common stock may not improve.

While our board of directors has proposed the Reverse Stock Split to bring the price of our common stock back above $1.00 per share in order to meet the requirements for the continued listing of our common stock on Nasdaq, there is no guarantee that the price of our common stock will not decrease in the future, or that our common stock will remain in compliance with Nasdaq listing standards. There can be no guarantee that the closing bid price of our common stock will remain at or above $1.00 for 10 consecutive trading days, whether following the Reverse Stock Split or otherwise, which is required to cure our current Nasdaq listing standard deficiency.

Effect of the Reverse Stock Split

If the Reverse Split Proposal is approved and our board of directors elects to effect the Reverse Stock Split, the number of outstanding shares of common stock will be reduced in proportion to the ratio of the split chosen by our board of directors. As of the effective time of the Reverse Stock Split, we would also adjust and proportionately decrease the number of shares of our common stock reserved for issuance upon exercise of, and adjust and proportionately increase the exercise price of, all options and warrants and other rights to acquire our common stock. In addition, as of the effective time of the Reverse Stock Split, we would adjust and proportionately decrease the total number of shares of our common stock that may be the subject of the future grants under our stock plans.

The Reverse Stock Split would be effected simultaneously for all outstanding shares of our common stock. The Reverse Stock Split would affect all of our stockholders uniformly and would not change any stockholder's percentage ownership interest in our company, except to the extent that the Reverse Stock Split results in any of our stockholders owning fractional shares. We will not issue any fractional shares as a result of the Reverse Stock Split and in lieu thereof any stockholders that would otherwise be entitled to receive a fractional share will be entitled to a cash payment. The Reverse Stock Split would not change the terms of our common stock. The Reverse Stock Split is not intended as, and would not have the effect of, a "going private transaction" covered by Rule 13e-3 under the Securities Exchange Act of 1934 (the "***Exchange Act***"). Following the Reverse Stock Split, we would continue to be subject to the periodic reporting requirements of the Exchange Act.

Assuming Reverse Stock Split ratios of 1-for-5, 1-for-10 and 1-for-15, which reflect the low end, middle and high end of the range that our stockholders are being asked to approve, the following table sets forth (i) the number of shares of our common stock that would be issued and outstanding, (ii) the number of shares of our common stock that would be reserved for issuance pursuant to outstanding

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warrants and options, and (iii) the weighted-average exercise price of outstanding options and warrants, each giving effect to the Reverse Stock Split and based on securities outstanding as of 71,038,419.

	Before Reverse Stock Split	Reverse Stock Split Ratio of 1-for-5	Reverse Stock Split Ratio of 1-for-10	Reverse Stock Split Ratio of 1-for-15
Number of Shares of Common Stock Issued and Outstanding	71,038,419	14,207,684	7,103,842	4,735,895
Number of Shares of Common Stock Reserved for Issuance Pursuant to Outstanding Options and Warrants	46,637,250	9,327,450	4,663,725	3,109,150
Weighted-Average Exercise Price of Outstanding Options and Warrants	1.38	6.91	13.82	20.73

If our board of directors does not implement the Reverse Stock Split by June 30, 2019, the authority granted in this proposal to implement the Reverse Stock Split would terminate.

Our directors and executive officers have no substantial interests, directly or indirectly, in the matters set forth in the Reverse Split Proposal, except to the extent of their ownership in shares of our common stock and securities convertible or exercisable for our common stock, which shares and securities would be subject to the same proportionate adjustment in accordance with the terms of the Reverse Stock Split as all other outstanding shares of our common stock and securities convertible into or exercisable for our common stock.

Authorized Shares of Common Stock

We are currently authorized under our certificate of incorporation to issue up to a total of 155,000,000 shares of capital stock, comprised of 150,000,000 shares of common stock and 5,000,000 shares of preferred stock. While the Reverse Stock Split would decrease the number of outstanding shares of our common stock, it would not change the number of authorized shares under our certificate of incorporation. Consequently, the Reverse Stock Split would have the effect of increasing the number of shares of common stock available for issuance under our certificate of incorporation. Our board of directors believes that such an increase is in our and our stockholders' best interests as it would provide us with greater flexibility to issue shares of common stock in connection with possible future financings, joint ventures and acquisitions as well as under our equity incentive plans and for other general corporate purposes. We do not currently have any plans, understandings, arrangements, commitments or agreements, written or oral, for the issuance of the additional shares of common stock that would become available for issuance if the Reverse Stock Split is effected, however we desire to have the shares available to provide us with additional flexibility to use our common stock for these business and financial purposes in the future.

By increasing the number of authorized but unissued shares of common stock, the Reverse Stock Split could, under certain circumstances, have an anti-takeover effect, although this is not the intent of our board of directors. For example, our board of directors might be able to delay or impede a takeover or transfer of control of our company by causing such additional authorized but unissued shares to be issued to holders who might side with our board of directors in opposing a takeover bid that the board determines is not in the best interests of our company or our stockholders. The Reverse Stock Split could therefore have the effect of discouraging unsolicited takeover attempts. By potentially discouraging initiation of any such unsolicited takeover attempts the Reverse Stock Split could limit the opportunity for our stockholders to dispose of their shares at the higher price generally available in takeover attempts or that may be available under a merger proposal. The Reverse Stock Split could have the effect of permitting our current management, including our current board of directors, to retain its position, and place it in a better position to resist changes that stockholders may wish to

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make if they are dissatisfied with the conduct of our business. However, our board of directors is not aware of any attempt to take control of our company and the board did not authorize the Reverse Stock Split with the intent that it be utilized as a type of anti-takeover device.

Procedure for Effecting the Reverse Stock Split

If our stockholders approve the Reverse Split Proposal, and if our board of directors still believes that a Reverse Stock Split is in the best interests of us and our stockholders, our board of directors will determine the ratio of the Reverse Stock Split to be implemented and we will publicly announce the ratio selected by our board of directors and file the certificate of amendment effecting the Reverse Split with the Secretary of State of the State of Delaware.

Beneficial Owners of Common Stock. Upon the implementation of the Reverse Stock Split, we would treat shares held by stockholders in street name in the same manner as shares held directly by stockholders of record. Banks, brokers, custodians or other nominees would be instructed to effect the Reverse Stock Split for their beneficial holders holding our common stock in street name. However, these banks, brokers, custodians or other nominees may have different procedures than our procedures for stockholders of record for processing the Reverse Stock Split and making payment for fractional shares. If a stockholder holds shares of our common stock with a bank, broker, custodian or other nominee and has any questions in this regard, stockholders are encouraged to contact their bank, broker, custodian or other nominee.

Registered Holders of Common Stock. All of our registered holders of common stock hold their shares electronically in book-entry form with our transfer agent, American Stock Transfer & Trust Company, LLC. These stockholders do not hold physical stock certificates evidencing their ownership of our common stock. However, they are provided with a statement reflecting the number of shares of our common stock registered in their accounts. If a stockholder holds registered shares in book-entry form with our transfer agent, no action needs to be taken to receive post-Reverse Stock Split shares and any payment in lieu of fractional shares, if applicable, because the exchange and payment will be automatic.

Fractional Shares

We would not issue fractional shares in connection with the Reverse Stock Split. Instead, stockholders who otherwise would be entitled to receive fractional shares because they hold a number of shares not evenly divisible by the Reverse Stock Split ratio would be entitled to receive a cash payment in lieu thereof at a price equal to the fraction of a share to which the stockholder would otherwise be entitled multiplied by the closing price of our common stock as reported on the Nasdaq on the effective date of the Reverse Stock Split.

No Appraisal Rights

No action is proposed herein for which the laws of the State of Delaware, or our certificate of incorporation or bylaws, provide a right to our stockholders to dissent and obtain appraisal of, or payment for, such stockholders' capital stock.

Accounting Matters

The Reverse Stock Split would not affect the par value of our common stock per share, which would remain $0.001 par value per share, while the number of outstanding shares of common stock would decrease in accordance with the Reverse Stock Split ratio. As a result, as of the effective time of the Reverse Stock Split, the stated capital attributable to common stock on our balance sheet would decrease and the additional paid-in capital account on our balance sheet would increase by an offsetting amount. Following the Reverse Stock Split, reported per share net income or loss would be

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higher because there would be fewer shares of common stock outstanding and we would adjust historical per share amounts set forth in our future financial statements.

Federal Income Tax Consequences

The following discussion is a summary of the material U.S. federal income tax consequences of a reverse stock split to us and to U.S. Holders (as defined below) that hold shares of our common stock as capital assets for U.S. federal income tax purposes. This discussion is based upon current U.S. tax law, which is subject to change, possibly with retroactive effect, and differing interpretations. Any such change may cause the U.S. federal income tax consequences of a reverse stock split to vary substantially from the consequences summarized below. We have not sought and will not seek any rulings from the Internal Revenue Service (the "***IRS***") regarding the matters discussed below and there can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the proposed Reverse Stock Split.

For purposes of this discussion, a "U.S. Holder" is a beneficial owner of our common stock that, for U.S. federal income tax purposes, is or is treated as (i) an individual who is a citizen or resident of the United States; (ii) a corporation (or any other entity or arrangement treated as a corporation) created or organized under the laws of the United States, any state thereof, or the District of Columbia; (iii) an estate, the income of which is subject to U.S. federal income tax regardless of its source; or (iv) a trust if (1) its administration is subject to the primary supervision of a court within the United States and all of its substantial decisions are subject to the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Internal Revenue Code of 1986, as amended (the "***Code***")), or (2) it has a valid election in effect under applicable U.S. Treasury regulations to be treated as a United States person.

This summary does not address all aspects of U.S. federal income taxation that may be relevant to U.S. Holders in light of their particular circumstances or to stockholders who may be subject to special tax treatment under the Code, including, without limitation, dealers in securities, commodities or foreign currency, persons who are treated as non-U.S. persons for U.S. federal income tax purposes, certain former citizens or long-term residents of the United States, insurance companies, tax-exempt organizations, banks, financial institutions, small business investment companies, regulated investment companies, real estate investment trusts, retirement plans, persons whose functional currency is not the U.S. dollar, traders that mark-to-market their securities or persons who hold their shares of our common stock as part of a hedge, straddle, conversion or other risk reduction transaction. If a partnership (or other entity treated as a partnership for U.S. federal income tax purposes is the beneficial owner of our common stock, the U.S. federal income tax treatment of a partner in the partnership will generally depend on the status of the partner and the activities of the partnership. Accordingly, partnerships (and other entities treated as partnerships for U.S. federal income tax purposes) holding our common stock and the partners in such entities should consult their own tax advisors regarding the U.S. federal income tax consequences of the proposed Reverse Stock Split to them.

The state and local tax consequences, alternative minimum tax consequences, non-U.S. tax consequences and U.S. estate and gift tax consequences of a reverse stock split are not discussed herein and may vary as to each U.S. Holder. Furthermore, the following discussion does not address any tax consequences of transactions effectuated before, after or at the same time as the proposed Reverse Stock Split, whether or not they are in connection with the proposed Reverse Stock Split. This discussion should not be considered as tax or investment advice, and the tax consequences of a reverse stock split may not be the same for all stockholders. U.S. Holders should consult their own tax advisors to understand their individual federal, state, local and foreign tax consequences.

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Tax Consequences to the Company. We believe that a reverse stock split will constitute a reorganization under Section 368(a) (1)(E) of the Code. Accordingly, we should not recognize taxable income, gain or loss in connection with a reverse stock split.

Tax Consequences to U.S. Holders. A U.S. Holder generally should not recognize gain or loss upon the proposed Reverse Stock Split for U.S. federal income tax purposes, except with respect to cash received in lieu of a fractional share of our common stock, as discussed below. A U.S. Holder's aggregate adjusted tax basis in the shares of our common stock received pursuant to the proposed Reverse Stock Split should equal the aggregate adjusted tax basis of the shares of our common stock exchanged therefor (reduced by the amount of such basis that is allocated to any fractional share of our common stock). The U.S. Holder's holding period in the shares of our common stock received pursuant to the proposed Reverse Stock Split should include the holding period in the shares of our common stock exchanged therefor. U.S. Treasury Regulations provide detailed rules for allocating the tax basis and holding period of shares of common stock surrendered in a recapitalization to shares received in the recapitalization. U.S. Holders of shares of our common stock acquired on different dates and at different prices should consult their tax advisors regarding the allocation of the tax basis and holding period of such shares.

A U.S. Holder that, pursuant to the proposed Reverse Stock Split, receives cash in lieu of a fractional share of our common stock should recognize capital gain or loss in an amount equal to the difference, if any, between the amount of cash received and the portion of the U.S. Holder's aggregate adjusted tax basis in the shares of our common stock surrendered that is allocated to such fractional share. Such capital gain or loss will be short term if the pre-Reverse Stock Split shares were held for one year or less at the effective time of the Reverse Stock Split and long term if held for more than one year. No gain or loss will be recognized by us as a result of the proposed Reverse Stock Split.

A U.S. Holder of our common stock may be subject to information reporting and backup withholding on cash paid in lieu of a fractional share in connection with the proposed Reverse Stock Split. A U.S. Holder of our common stock will be subject to backup withholding if such U.S. Holder is not otherwise exempt and such U.S. Holder does not provide its taxpayer identification number in the manner required or otherwise fails to comply with applicable backup withholding tax rules. Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be refunded or allowed as a credit against a U.S. Holder's federal income tax liability, if any, provided the required information is timely furnished to the IRS. U.S. Holders of our common stock should consult their own tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption.

The U.S. federal income tax discussion set forth above does not discuss all aspects of U.S. federal income taxation that may be relevant to a particular stockholder in light of such stockholder's circumstances and income tax situation. Accordingly, we urge you to consult with your own tax advisor with respect to all of the potential U.S. federal, state, local and foreign tax consequences to you of the Reverse Stock Split.

Vote Required and Board of Directors Recommendation

Pursuant to the Delaware General Corporation Law, this proposal must be approved by the affirmative vote of a majority of the outstanding shares of our common stock. Abstentions and broker non-votes with respect to this proposal will be counted for purposes of establishing a quorum and, if a quorum is present, will have the same practical effect as a vote against this proposal.

OUR BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" THE AMENDMENT TO THE CERTIFICATE OF INCORPORATION TO APPROVE THE REVERSE STOCK SPLIT.

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PROPOSAL NO. 2

TO APPROVE AN AMENDED AND RESTATED 2015 STOCK INCENTIVE PLAN

On September 21, 2018, our board of directors unanimously approved, subject to stockholder approval, an amendment and restatement of our 2015 Stock Incentive Plan (the "***2015 Plan***"). We are asking our stockholders to approve the Amended and Restated 2015 Stock Incentive Plan approved by our board of directors (the "***Amended and Restated 2015 Plan***"). If approved by stockholders, the Amended and Restated 2015 Plan would:

- increase the number of shares of our common stock that may be issued under the 2015 Plan by 8,500,000, increasing the maximum number of shares issuable under the 2015 Plan from 3,879,966 to 12,379,966, on a pre-Reverse Stock Split basis (the "***Plan Increase***");

- eliminate the "evergreen" or automatic replenishment provision of the 2015 Plan pursuant to which the shares authorized for issuance under the 2015 Plan are automatically increased on an annual basis;

- provide that shares tendered as payment for the exercise of an award or withheld to satisfy tax withholding obligations with respect to an award and shares underlying stock appreciation rights ("***SARs***") settleable in either cash or in stock that are actually settled in cash will not be added back to the number of shares available for future grant; and

- prohibit the payment of dividends or dividend equivalents with respect to unvested awards and the accrual of dividend equivalents with respect to stock options and SARs.

Why We Are Requesting Stockholder Approval of the Amended and Restated 2015 Plan

We believe that our future success depends, in large part, upon our ability to maintain a competitive position in attracting, retaining and motivating persons who are expected to make important contributions to our company by providing such persons with equity ownership opportunities and performance-based incentives. The life sciences industry in the Cambridge and Boston, Massachusetts market is highly competitive, and our results are largely attributable to the talents, expertise, efforts and dedication of our employees. Our compensation program, including the granting of equity compensation, is the primary means by which we attract and recruit new employees, as well as retain our most experienced and skilled employees.

Equity compensation is also fundamental to our compensation philosophy and core objectives of paying for performance and aligning the interests of employees with those of stockholders. A significant portion of our employees' compensation is provided in the form of equity. We believe that equity awards, and the potential they hold for appreciation through an increase in our stock price, support our pay-for-performance philosophy, provide further incentive to our employees to focus on creating long-term stockholder value and create an ownership culture that links employees' interests with those of our stockholders and our long-term results, performance, and financial condition.

The outstanding incentive equity holdings of our employees were significantly diluted by our June 2018 financing, which resulted in the issuance of 42 million units at a price of $1.00 per unit, with each unit comprised of one share of common stock and a warrant to purchase one share of common stock at an exercise price of $1.20 per share. Immediately prior to the June 2018 financing, the shares of common stock acquirable upon exercise of outstanding stock options held by our employees was approximately 9% of our fully diluted capitalization, based on shares and equity instruments outstanding, whether or not vested. This percentage declined to 3.5% of our fully diluted capitalization, as of September 30, 2018, primarily due to the June 2018 financing. In addition, as of September 30, 2018, 72.1% of our outstanding stock options were underwater, with a weighted-average exercise price of $3.02 per share and individual option exercise prices ranging up to $14.05 per share as compared to

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the $0.84 per share closing price of our common stock on the Nasdaq Global Market on October 1, 2018. Accordingly, we believe that our employees currently have a very limited opportunity to participate in any future appreciation in the value of our common stock. For example, if the value of our common stock tripled from its closing price on the Nasdaq Global Market of $0.84 on October 1, 2018 to $2.52 per share, our employees would be entitled to realize less than 2.2% of the increased equity value of our company on a fully diluted basis assuming full acceleration of all vesting provisions. We believe that such a limited opportunity to participate in appreciation in the value of our common stock results in such outstanding options holding insufficient retention value for our employees, puts us at risk of not being able to retain our most experienced and skilled employees and provides for insufficient alignment of our employees' interests with those of our stockholders.

As of September 30, 2018, we had 123,227 shares available for grant under the 2015 Plan, representing 0.18% of the sum of (i) the total number of our shares of common stock outstanding, plus (ii) the total number of shares of common stock issuable under outstanding equity incentive awards that were not underwater, plus (iii) the total number of shares available for grant under the 2015 Plan. During the years ended December 31, 2016 and 2017 and the nine months ended September 30, 2018, we granted equity awards with respect to 1,068,845, 890,740 and 2,133,845 shares, respectively, to employees, non-employee directors and consultants. The grants made during the nine months ended September 30, 2018 included grants approved by our board of directors in September 2018 that were intended to provide additional retentive value for our employees in light of the dilutive effect our June 2018 financing had on our employees' existing stock option and other equity holdings. A summary of outstanding stock options granted under our 2008 Equity Incentive Plan (the "2008 Plan") and 2015 Plan, our shares available for grant under our 2015 Plan, and related information for employees and nonemployees as of September 30, 2018 follows:

Options Outstanding	Shares Available for Grant	Weighted Average Exercise Price of Options Outstanding	Weighted Average Remaining Contractual Term of Options Outstanding (years)	Aggregate Intrinsic Value (in thousands)
4,489,457	123,227	$ 3.02	8.17	$ 102

No restricted stock or restricted stock unit awards (or other such "full-value" awards) were outstanding as of September 30, 2018. Without the Plan Increase, we would not be able to adequately complete our planned annual company-wide equity award grant for fiscal year 2018, and we believe that we would not have sufficient shares available for grant under the 2015 Plan to make meaningful equity incentive grants to any potential new employees. Without the Plan Increase, we believe that we would be forced to rely on providing cash-settled awards for a portion of our incentive-based compensation in order to retain our most experienced and skilled employees, which we believe would put us at a competitive disadvantage in our industry and would not be in our stockholders' best interests as it would remove incentives aligning the interests of our employees and our senior leaders with those of our stockholders to drive company-wide performance and create long-term stockholder value.

In determining the amount of the proposed Plan Increase amount, we considered several factors, including the number of options shares needed for annual employee option grants over the next two to three years, which we estimated at 3% to 4% of our outstanding stock at the time of such grants, the number of option shares needed for new hires over the next two to three years, including anticipated executive level hires in senior commercial, financial and clinical positions, and potential performance grants to employees to align employee interests with specified program, strategic and financial priorities. If stockholders approve the Amended and Restated 2015 Plan, we will have 8,623,227 shares of common stock available for issuance pursuant to future awards under the Amended and Restated 2015 Plan. Given our historical and projected utilization and assuming relative stock price stability, we expect that this number of shares available for issuance will meet our grant needs for the next two to three years.

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In addition to the Plan Increase, the Amended and Restated 2015 Plan would implement several changes to the 2015 Plan designed to protect stockholder interests, promote effective corporate governance and reflect use of corporate governance best practices, specifically:

No Evergreen Provision. The Amended and Restated 2015 Plan would eliminate the "evergreen" or automatic replenishment provision of the 2015 Plan pursuant to which the shares authorized for issuance under the 2015 Plan are automatically increased on an annual basis.

Restrictions on Share Recycling. The Amended and Restated 2015 Plan would provide that shares tendered as payment for the exercise of an award or withheld to satisfy tax withholding obligations with respect to an award and shares underlying SARs settleable in either cash or in stock that are actually settled in cash will no longer be added back to the number of shares available for the future grant under the plan.

Restrictions on Dividends and Dividend Equivalents. The Amended and Restated 2015 Plan would prohibit the payment of dividends or dividend equivalents with respect to unvested awards and the accrual of dividend equivalents with respect to stock options and SARs.

Vote Required and Board of Directors Recommendation

To be approved, this proposal requires the affirmative vote of the majority of the shares of our common stock cast at the Special Meeting for the proposal. Abstentions and broker non-votes with respect to this proposal will be counted for purposes of establishing a quorum and, if a quorum is present, abstentions and broker non-votes will have no effect on the outcome of the vote on this proposal.

We believe that the Amended and Restated 2015 Plan and the Plan Increase will serve a critical role in attracting and retaining the high caliber employees and consultants essential to our success and in motivating these individuals to strive to enhance our growth and profitability. Therefore, our board of directors urges you to vote to approve the Plan Amendment Proposal.

Our directors and executive officers have an interest in this proposal by virtue of their being eligible to receive equity awards under the Amended and Restated 2015 Plan. If the Plan Amendment Proposal is approved, we plan to file a registration statement on Form S-8 with the SEC to register the additional shares of common stock authorized under the Amended and Restated 2015 Plan by the Plan Increase.

OUR BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" THE PLAN AMENDMENT PROPOSAL.

Summary of the Amended and Restated 2015 Plan

The following summary of the Amended and Restated 2015 Plan assumes and gives effect to stockholder approval of the Plan Amendment Proposal and is qualified in its entirety by the specific language of the Amended and Restated 2015 Plan, which is set forth in *Appendix B* to this proxy statement, with the proposed new text underlined, bolded and italicized and the proposed deleted text marked as struck out.

Purpose. The purpose of the Amended and Restated 2015 Plan is to advance the interests of our stockholders by enhancing our ability to attract, retain and motivate persons who are expected to make important contributions to our company and by providing such persons with equity ownership opportunities and performance-based incentives that are intended to better align the interests of such persons with those of our stockholders.

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Eligibility. All of our employees, officers and directors, as well as consultants and advisors to our company, are eligible to be granted awards under the Amended and Restated 2015 Plan; however, incentive stock options may only be granted to our employees.

Shares Available for Awards. An aggregate of 12,379,966 shares of our common stock will be authorized for issuance under the Amended and Restated 2015 Plan, of which 2,917 shares were already issued, 3,753,822 shares were subject to outstanding awards and 8,623,227 were available for grant of future awards, in each case as of September 30, 2018 and after giving effect to the Plan Increase of 8,500,000 shares. To the extent awards outstanding as of September 30, 2018 under our 2008 Equity Incentive Plan expire, terminate or are otherwise surrendered, canceled, forfeited or repurchased by us at their original issuance price pursuant to a contractual repurchase right, they will increase the number of shares authorized for issuance under the Amended and Restated 2015 Plan, subject to certain limitations specified in the Amended and Restated 2015 Plan.

All shares of our common stock covered by SARs are counted against the number of shares available for the grant of awards under the Amended and Restated 2015 Plan; provided, however, that (i) SARs that may be settled only in cash will not be so counted and (ii) if we grant a SAR in tandem with an option for the same number of shares of common stock and provide that only one such award may be exercised (a "***Tandem SAR***"), only the shares covered by the option, and not the shares covered by the Tandem SAR, will be so counted, and the expiration of one in connection with the other's exercise will not restore shares to the Amended and Restated 2015 Plan.

If any award under the Amended and Restated 2015 Plan (i) expires or is terminated, surrendered or canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of common stock subject to such award being repurchased by us at the original issuance price pursuant to a contractual repurchase right) or (ii) results in any common stock not being issued, the unused common stock covered by such award shall again be available for the grant of awards under the Amended and Restated 2015 Plan, subject to specified limitations. Shares of common stock delivered (by actual delivery, attestation, or net exercise) to us by a plan participant to (1) purchase shares of common stock upon the exercise of an award or (2) satisfy tax withholding obligations (including shares retained from the award creating the tax obligation) will not be added back to the number of shares available for the future grant of awards.

In connection with a merger or consolidation of an entity with our company or the acquisition by us of property or stock of an entity, our board of directors may grant awards under the Amended and Restated 2015 Plan in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof. Such substitute awards may be granted on such terms as our board of directors deems appropriate in the circumstances, notwithstanding any limitations on awards contained in the Amended and Restated 2015 Plan. Such substitute awards will not count against the overall share limit under the Amended and Restated 2015 Plan, except as may be required by reason of Section 422 and related provisions of the Code and the regulations thereunder.

Plan Administration. Our board of directors administers the Amended and Restated 2015 Plan and has authority to grant awards and to adopt, amend and repeal the administrative rules, guidelines and practices relating to the Amended and Restated 2015 Plan and to construe and interpret the terms of the plan and any award agreements entered into under the plan. Our board of directors may correct any defect, supply any omission or reconcile any inconsistency in the Amended and Restated 2015 Plan or any award under the plan in the manner and to the extent it deems expedient and it is the sole and final judge of such expediency. All decisions by our board of directors are made in the board's sole discretion and are final and binding on all persons having or claiming any interest in the Amended and Restated 2015 Plan or in any award under the plan.

Our board of directors may delegate any or all of its powers under the Amended and Restated 2015 Plan to one or more committees or subcommittees of the board. Our board of directors has

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authorized its compensation committee to administer the Amended and Restated 2015 Plan, including delegation to the compensation committee of the authority to interpret the terms of the Amended and Restated 2015 Plan, to grant options thereunder and to make stock awards thereunder; provided, however, that, the compensation committee is not authorized to amend the Amended and Restated 2015 Plan. Our board of directors may also delegate authority to an executive officer to grant awards under the Amended and Restated 2015 Plan to employees other than executive officers, provided that the board will fix the terms of the awards to be granted by such executive officer, including the exercise price of such awards (or a formula for establishing such price), and the maximum number of shares subject to awards that such executive officer may make. All references that we make to our board of directors in this summary of the Amended and Restated 2015 Plan are also intended to include reference to any committee or subcommittee of the board or officer to whom our board of directors has delegated authority under the Amended and Restated 2015 Plan.

Types of Awards. The Amended and Restated 2015 Plan authorizes the award of stock options, SARs, restricted stock awards, restricted stock units and other stock-based awards.

Stock Options. Stock options entitle the holder to purchase a specified number of shares of common stock at a specified exercise price, subject to such other terms and conditions as are specified in connection with the option grant. The Amended and Restated 2015 Plan allows for the grant of nonqualified stock options as well as incentive stock options, which qualify under Section 422 of the Code and may be granted only to our employees or employees of any parent or subsidiary of ours. The exercise price of incentive stock options and nonqualified stock options granted under the Amended and Restated 2015 Plan will not be less than the fair market value of a share of our common stock on the date of grant. The maximum term of options granted under Amended and Restated 2015 Plan is ten years.

Stock Appreciation Rights. SARs entitle the holder, upon exercise, to receive an amount of common stock or cash or a combination thereof determined by reference to appreciation, from and after the date of grant, in the fair market value of our common stock over the measurement price of the SAR. The per share measurement price of a SAR granted under the Amended and Restated 2015 Plan may not be less than the fair market value of a share of our common stock on the date of grant. The maximum term of SARs granted under Amended and Restated 2015 Plan is ten years.

Restricted Stock Awards. Restricted stock awards entitle the recipient to acquire shares of common stock subject to our right to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeitures of such shares if issued at no cost) from the recipient in the event that conditions specified in the applicable award are not satisfied prior to the end of the applicable restriction period or periods specified in the award.

Restricted Stock Units. Restricted stock units entitle the recipient to receive such number of shares of common stock or (if so provided in the applicable award agreement) an amount of cash equal to the fair market value of such number of shares of common stock as are set forth in the applicable award agreement.

Other Stock-Based Awards. The Amended and Restated 2015 Plan authorizes other awards of shares of common stock and other awards that are valued in whole or in part by reference to, or are otherwise based on, shares of common stock or other property, having such terms and conditions as our board of directors may determine ("***Other Stock-Based Awards***"). Other Stock-Based Awards are available as a form of payment in the settlement of other awards granted under the Amended and Restated 2015 Plan or as payment in lieu of compensation to which a participant under the plan is otherwise entitled. Other Stock-Based Awards may be paid in shares of common stock or cash, as our board of directors may determine.

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Limitation on Repricing of Stock Options and SARs. With respect to stock options and SARs, unless such action is approved by our stockholders or otherwise permitted under the terms of the Amended and Restated 2015 Plan as an equitable adjustment in connection with certain changes in capitalization and reorganization events as described below, we may not (i) amend any outstanding stock option or SAR granted under the plan to provide an exercise or measurement price per share that is lower than the then-current exercise or measurement price per share of such outstanding stock option or SAR, (ii) cancel any outstanding stock option or SAR (whether or not granted under the plan) and grant in substitution therefor new awards under the plan (other than certain substitute awards described above) covering the same or a different number of shares of common stock and having an exercise or measurement price per share lower than the then-current exercise or measurement price per share of the cancelled stock option or SAR, (iii) cancel in exchange for a cash payment any outstanding stock option or SAR with an exercise or measurement price per share above the then-current fair market value of a share of our common stock or (iv) take any other action under the plan that constitutes a "repricing" within the meaning of the rules of Nasdaq.

Restrictions on Dividends and Dividend Equivalents. The Amended and Restated 2015 Plan prohibits the payment of dividends or dividend equivalents with respect to unvested awards and the accrual of dividend equivalents with respect to stock options and SARs.

Equitable Adjustments. In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event (including the Reverse Stock Split), or any dividend or distribution to holders of our common stock other than an ordinary cash dividend, we are required by the Amended and Restated 2015 Plan to make equitable adjustments (or make substitute awards, if applicable), in a manner determined by our board of directors, to:

- the number and class of securities available under the Amended and Restated 2015 Plan;
- the share counting rules under the Amended and Restated 2015 Plan;
- the number and class of securities and exercise price per share of each outstanding option;
- the share and per-share provisions and measurement price of each outstanding SAR;
- the number of shares and the repurchase price per share subject to each outstanding restricted stock award or restricted stock unit award; and
- the share and per-share related provisions and purchase price, if any, of any outstanding Other Stock-Based Award.

Upon a merger or other reorganization event (as defined in the Amended and Restated 2015 Plan), our board of directors, may, on such terms as our board determines (except to the extent specifically provided otherwise in an applicable award agreement or other agreement between the plan participant and us), take any one or more of the following actions pursuant to the Amended and Restated 2015 Plan, as to some or all outstanding awards, other than restricted stock awards:

- provide that all outstanding awards will be assumed or substantially equivalent awards will be substituted by the successor corporation (or an affiliate thereof);
- upon written notice to a participant, provide that the participant's unexercised awards will terminate immediately prior to the consummation of such transaction unless exercised by the participant within a specified period following the date of such notice;
- provide that outstanding awards will become exercisable, realizable or deliverable, or restrictions applicable to outstanding awards will lapse, in whole or in part, prior to or upon the reorganization event;

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in the event of a reorganization event pursuant to which holders of our common stock will receive a cash payment for each share surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each award held by a participant equal to (1) the number of shares of our common stock subject to the vested portion of the award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event) multiplied by (2) the excess, if any, of the cash payment for each share surrendered in the reorganization event over the exercise, measurement or purchase price of such award and any applicable tax withholdings, in exchange for the termination of such award;

provide that, in connection with a liquidation or dissolution, awards convert into the right to receive liquidation proceeds (if applicable, net of the exercise, measurement or purchase price thereof and any applicable tax withholdings); or

any combination of the foregoing.

Our board of directors is not obligated by the Amended and Restated 2015 Plan to treat all awards, all awards held by a participant or all awards of the same type, identically.

In the case of certain restricted stock units, no assumption or substitution is permitted, and the restricted stock units will instead be settled in accordance with the terms of the applicable restricted stock unit agreement.

Upon the occurrence of a reorganization event other than a liquidation or dissolution, the repurchase and other rights under each outstanding restricted stock award will continue for the benefit of the successor company and will, unless our board of directors may otherwise determine, apply to the cash, securities or other property which our common stock is converted into or exchanged for pursuant to the reorganization event, unless our board provided for the termination or deemed satisfaction of such repurchase or other rights under the restricted stock award agreement or any other agreement between the participant and us. Upon the occurrence of a reorganization event involving a liquidation or dissolution, all restrictions and conditions on each outstanding restricted stock award will automatically be deemed terminated or satisfied, unless otherwise provided in the agreement evidencing the restricted stock award or in any other agreement between the participant and us.

Transferability. Subject to limited exceptions specified in the Amended and Restated 2015 Plan, awards under the Amended and Restated 2015 Plan may not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an incentive stock option, pursuant to a qualified domestic relations order, and, during the life of the plan participant, are exercisable only by the plan participant.

Acceleration. Our board of directors may at any time provide that any award under the Amended and Restated 2015 Plan shall become immediately exercisable in whole or in part, free of some or all restrictions or conditions, or otherwise realizable in whole or in part, as the case may be.

Amendment, Term and Termination. Our board of directors may amend, suspend or terminate the Amended and Restated 2015 Plan at any time, except that stockholder approval will be required to comply with applicable law or stock market requirements. No award may be granted under the Amended and Restated 2015 Plan after June 23, 2025.

U.S. Federal Income Tax Consequences

The following summary is intended only as a general guide to the U.S. federal income tax consequences of participation in the Amended and Restated 2015 Plan and does not attempt to describe all possible federal or other tax consequences of such participation or tax consequences based on particular circumstances.

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Incentive Stock Options. An optionee who is granted an incentive stock option does not recognize taxable income at the time the option is granted or upon its exercise, although the exercise may subject the optionee to the alternative minimum tax. Upon a disposition of the shares more than two years after grant of the option and one year after exercise of the option, any gain or loss is treated as long-term capital gain or loss. If these holding periods are not satisfied, the optionee recognizes ordinary income at the time of disposition equal to the difference between the exercise price and the lower of (i) the fair market value of the shares at the date of the option exercise or (ii) the sale price of the shares. Any gain or loss recognized on such a premature disposition of the shares to the extent not recognized as taxable income as provided above, will be long-term or short-term capital gain or loss, depending on the holding period.

Nonqualified Stock Options. An optionee does not recognize taxable income at the time he or she is granted a nonqualified stock option. Upon exercise, the optionee recognizes taxable income generally measured by the excess of the then fair market value of the shares over the exercise price. Any taxable income recognized in connection with an option exercise by our employee is subject to tax withholding by us. We are generally entitled to a deduction in the same amount as the ordinary income recognized by the optionee. Upon a disposition of such shares by the optionee, any difference between the sale price and the optionee's exercise price, to the extent not recognized as taxable income as provided above, is treated as long-term or short-term capital gain or loss, depending on the holding period.

Stock Appreciation Rights. A holder of a SAR does not recognize taxable income at the time he or she is granted a SAR. Upon exercise, the participant will recognize ordinary income in an amount equal to the amount of cash received and the fair market value of the shares received, and if granted to an employee, tax withholding is generally due. Any additional gain or loss recognized upon any later disposition of the shares would be capital gain or loss, depending on the holding period. We generally should be entitled to a deduction equal to the amount of ordinary income recognized by the participant.

Restricted Stock. A participant acquiring restricted stock generally will recognize ordinary income equal to the fair market value of the shares on the date our right of repurchase lapses (i.e. the date the award vests). If the participant is an employee, such ordinary income generally is subject to withholding of income and employment taxes. The participant may elect, pursuant to Section 83(b) of the Code, to have the date of acquisition of the shares be a date earlier than the date our repurchase rights lapses, provided such election is made no later than 30 days after the participant acquires the shares. Upon the sale of shares acquired pursuant to a restricted stock award pursuant to which an election pursuant to Section 83(b) of the Code has been made, any gain or loss, based on the difference between the sale price and the fair market value on the determination date, will be taxed as short term or long term capital gain or loss, depending on the holding period. Any taxable income recognized in connection with the grant of restricted stock by our employee is subject to tax withholding by us. The Company generally should be entitled to a deduction equal to the amount of ordinary income recognized by the participant.

Restricted Stock Units. A participant generally will recognize no income upon the grant of a restricted stock unit. Upon the settlement and/or payment of restricted stock units, participants normally will recognize ordinary income in the year of receipt in an amount equal to the cash received and the fair market value of any nonrestricted shares received. If the participant is an employee, such ordinary income generally is subject to withholding taxes. Upon the sale of any shares received, any gain or loss, based on the difference between the sale price and the fair market value will be taxed as capital gain or loss, depending on the holding period. We generally should be entitled to a deduction equal to the amount of ordinary income recognized by the participant.

The foregoing is only a summary of the effect of federal income taxation upon award recipients and us with respect to the grant and exercise of options and SARs and the grant and vesting of

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restricted stock and restricted stock units under the Amended and Restated 2015 Plan. Reference should be made to the applicable provisions of the Code. In addition, the summary does not purport to be complete, and does not discuss the tax consequences of the Amended and Restated 2015 Plan participant's death or the provisions of the income tax laws of any municipality, state or foreign country in which the Amended and Restated 2015 Plan participant may reside, nor does it discuss the Medicare tax on net investment income.

Plan Benefits

As of September 30, 2018, approximately 23 employees of ours and 5 non-employee directors of ours were eligible to participate in the 2015 Plan. On October 1, 2018, the closing price of our common stock on the Nasdaq Global Market was $0.84 per share. No awards have been approved for grant under the Amended and Restated 2015 Plan contingent upon stockholder approval of the Plan Amendment Proposal. The granting of awards under the 2015 Plan is discretionary, and we cannot now determine with certainty the number or type of awards to be granted in the future to any particular person or group.

Since the adoption of 2015 Plan through September 30, 2018, we have granted the following stock options under the 2015 Plan to the individuals and groups listed below. In all cases, the securities underlying such stock options were shares of our common stock. As of the date hereof we have granted only stock options and no other type of award under the 2015 Plan.

Name and Position	Number of Shares Subject to Stock Options
Named Executive Officers	
Jill C. Milne, Ph.D.	
President and Chief Executive Officer	968,000
Joanne M. Donovan, M.D., Ph.D.	
Chief Medical Officer	461,000
Andrew Nichols, Ph.D.	
Chief Scientific Officer	429,000
All current executive officers as a group	2,323,200
All current directors who are not executive officers, as a group	181,282
Each associate of any such directors or executive officers	
Each person who received 5% of such awards	
Jill C. Milne, Ph.D.(1)	968,000
Joanne M. Donovan, M.D., Ph.D.(1)	461,000
Andrew Nichols, Ph.D.(1)	429,000
Deirdre Cunnane	
Chief Legal Officer	465,200
Angelika Fretzen, Ph.D.	
SVP Product Development	308,000
All employees who are not executive officers, as a group(2)	1,850,275

(1) The awards reported on these lines are the same awards as shown with respect to Drs. Milne, Donovan and Nichols, as applicable, in the "Named Executive Officers" section of this table, and represent all awards made to them under the 2015 Plan.

(2) Includes 608,018 shares subject to stock options that have expired without being exercised.

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PRINCIPAL STOCKHOLDERS

The following table sets forth information, to the extent known by us or ascertainable from public filings, with respect to the beneficial ownership of our common stock as of September 30, 2018 by:

- each person, or group of affiliated persons, who is known by us to beneficially own more than 5% of our common stock;
- each of our directors;
- each of our named executive officers ("***NEOs***"); and
- all of our current directors and executive officers as a group.

Beneficial ownership is determined in accordance with the rules and regulations 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 and include shares of common stock issuable upon the exercise of stock options that are immediately exercisable or exercisable within 60 days after September 30, 2018. Except as otherwise indicated, all of the shares reflected in the table are shares of common stock and all persons listed below have sole voting and investment power with respect to the shares beneficially owned by them, subject to community property laws, where applicable. The information is not necessarily indicative of beneficial ownership for any other purpose.

The percentage ownership calculations for beneficial ownership are based on 71,038,419 shares of common stock outstanding as of September 30, 2018. Except as otherwise indicated in the table below, addresses of named beneficial owners are in care of Catabasis Pharmaceuticals, Inc., One Kendall Square, Building 1400E, Suite B14202, Cambridge, MA 02139.

In computing the number of shares of common stock beneficially owned by a person and the percentage ownership of that person, we deemed outstanding shares of common stock subject to options held by that person that are currently exercisable or exercisable within 60 days after September 30, 2018. We did not deem these shares outstanding, however, for the purpose of computing the percentage ownership of any other person.

Name of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned
5% Stockholders		
Affiliates of Federated Investment Management Company(1)	10,434,000	14.7%
Affiliates of Empery Asset Management(2)	5,000,000	7.0%
Affiliates of Stonepine Capital Management, LLC(3)	4,800,000	6.5%
Affiliates of Armistice Capital, LLC(4)	3,634,316	5.1%
NEOs and Directors		
Jill C. Milne, Ph.D.(5)	813,221	1.1%
Joanne M. Donovan, Ph.D., M.D.(6)	227,306	*
Andrew Nichols, Ph.D.(7)	157,572	*
Burt Adelman, M.D.(8)	25,050	*
Kenneth Bate(9)	33,977	*
Jean George(10)	1,914,946	2.7%
Michael D. Kishbauch(11)	15,167	*
Michael Ross, Ph.D.(12)	2,881,761	4.1%
All current executive officers and directors as a group (9 persons)(13)	6,187,355	8.6%

* Represents beneficial ownership of less than 1% of our outstanding stock.

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(1) Consists of 10,434,000 shares of common stock beneficially owned by registered investment companies and separate accounts advised by subsidiaries of Federated Investors, Inc. ("***Federated***") that have been delegated the power to direct investment and power to vote the securities by the registered investment companies' board of trustees or directors and by the separate accounts' principals. All of the voting securities of Federated are held in the Voting Shares Irrevocable Trust ("***Trust***"), the trustees of which are Thomas R. Donahue, Rhodora J. Donahue and J. Christopher Donahue (collectively, the "***Trustees***"). Federated and the Trust each reported sole voting and dispositive power, and the Trustees reported shared voting and dispositive power, with respect to the shares of common stock owned by the registered investment companies and separate accounts advised by subsidiaries of Federated, however they expressly disclaimed that they were the beneficial owners of such shares. The address for each of the foregoing persons and entities is Federated Investors Tower, Pittsburgh, PA 15222-3779. The foregoing information is based on a Schedule 13G filed with the SEC on July 10, 2018 that reported beneficial ownership as of June 30, 2018.

(2) Consists of 5,000,000 shares of common stock held by funds to which Empery Asset Management, LP ("***Investment Manager***") serves as investment manager (the "***Empery Funds***"). Empery AM GP, LLC (the "***GP***"), is the sole general partner of Investment Manager and each of Ryan M. Lane and Martin D. Hoe is a Managing Member of the GP. Each of Investment Manager, Mr. Lane and Mr. Hoe (the "***Reporting Persons***") reported shared voting and dispositive power with respect to the shares held by the Empery Funds. In addition, each of the Reporting Persons reported shared voting and dispositive power with respect to an additional 5,000,0000 shares of common stock acquirable upon exercise of warrants that were subject to limitations on exercise that do not permit the exercise of such warrants to the extent that the Reporting Persons would beneficially own after any such exercise more than 4.99% of the outstanding shares of common stock, and accordingly the Reporting Persons reported that such warrants were not exercisable as of the date of such report. Each of the Empery Funds and each of the Reporting Persons disclaimed any beneficial ownership of all such shares of common stock and all such shares of common stock underlying such warrants. The address for each of the foregoing persons and entities is 1 Rockefeller Plaza, Suite 1205, New York, NY 10020. The foregoing information is based on a Schedule 13G filed with the SEC on June 25, 2018 that reported beneficial ownership as of June 20, 2018.

(3) Consists of 2,400,000 shares of common stock and an additional 2,400,000 shares of common stock acquirable upon exercise of warrants with respect to which each of Stonepine Capital, L.P. (the "***Partnership***"), Stonepine Capital Management, LLC (the "***General Partner***"), Jon M. Plexico and Timothy P. Lynch reported sole voting and dispositive power. The warrants are subject to a limitation on exercise that does not permit the exercise of such warrants to the extent that the Partnership and certain related persons and entities would beneficially own after any such exercise more than 9.99% of the outstanding shares of common stock, which limitation did not limit the exercisability of such warrants as of the date of such report. The General Partner is the general partner and investment adviser the Partnership and Mr. Plexico and Mr. Lynch are the control persons of the General Partner. Each of the foregoing persons and entities disclaimed membership in a group and disclaimed beneficial ownership of the shares except to the extent of that entity's or person's pecuniary interest therein. The address for each of the foregoing persons and entities is 919 NW Bond Street, Suite 204, Bend, OR 97703. The foregoing information is based, on part, on a Schedule 13G filed with the SEC on June 28, 2018 that reported beneficial ownership as of June 20, 2018.

(4) Consists of 3,634,316 shares of common stock with respect to which each of Armistice Capital, LLC ("***Armistice***"), Armistice Capital Master Fund Ltd. ("***Armistice Master Fund***") and Steven Boyd reported shared voting and dispositive power. Steve Boyd is a managing member of

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Armistice and a director of Armistice Master Fund. Each of Armistice and Mr. Boyd disclaimed beneficial ownership in such shares of common stock except to the extent of his or its pecuniary interest therein. The address for Armistice and Steve Boyd is 510 Madison Avenue, 22nd Floor, New York, NY 10022. The address for Armistice Master Fund is 20 Genesis Close, P.O. Box 314, Grand Cayman, KY1-1104, Cayman Islands. The foregoing information is based on a Schedule 13G filed with the SEC on July 2, 2018 that reported beneficial ownership as of June 20, 2018.

(5) Includes 550,596 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(6) Includes 226,897 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(7) Consists of 157,572 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(8) Consists of 25,050 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(9) Consists of 33,977 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(10) Includes 1,133,943 shares held by Advanced Technology Ventures VIII, L.P. ("***ATV VIII***"). ATV Associates VIII, L.L.C. ("***ATV A VIII***") is the General Partner of ATV VIII and exercises voting and dispositive authority over the shares held by ATV VIII. Voting and dispositive decisions of ATV A VIII are made collectively by Michael A. Carusi, Jean George, a member of our board of directors, Steven N. Baloff, Robert C. Hower and William C. Wiberg (collectively, the "***ATV VIII Managing Directors***"). ATV A VIII and the ATV VIII Managing Directors disclaim beneficial ownership of the shares held by ATV VIII except to the extent of their pecuniary interest therein. The address for each of the foregoing persons and entities is 500 Boylston Street, Suite 1380, Boston, MA 02116. The information about ATV VIII share ownership is based on a Schedule 13G filed with the SEC on February 14, 2018 that reported ownership as of December 31, 2017. Also includes 666,145 shares of common stock held by Lightstone Ventures, L.P. and 90,764 shares of common stock held by Lightstone Ventures (A), L.P. LSV Associates, LLC ("***LSV GP***") is the General Partner of Lightstone Ventures, L.P. and Lightstone Ventures (A), L.P. (collectively, "***LSV***") and exercises voting and dispositive authority over the shares held by LSV. Voting and dispositive decisions of LSV GP are made collectively by Michael A. Carusi, Jean George, a member of our board of directors, Ralph E. Christoffersen and Henry A. Plain, Jr. (collectively, the "***LSV Managing Directors***"). LSV GP and the LSV Managing Directors disclaim beneficial ownership of the shares held by LSV except to the extent of their pecuniary interest therein Ms. George disclaims beneficial ownership of the shares held by ATV VIII and LSV except to the extent of any pecuniary interest therein. Ms. George's address and the address for the Lightstone Ventures members and entities is 500 Boylston Street, Suite 1380, Boston, MA 02116. Also includes 24,094 shares of common stock issuable upon the exercise of options held by Ms. George exercisable within 60 days after September 30, 2018.

(11) Consists of 15,167 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

(12) Consists of 2,798,528 shares of record held by SV Life Sciences Fund V, L.P. ("***SVLS V LP***") and 59,139 shares of record held by SV Life Sciences Fund V Strategic Partners, L.P. ("***SVLS V SPP***"). SV Life Sciences Fund V (GP), LP ("***SVLS V GP***") is the general partner of SVLS V LP and SVLS V SPP. The general partner of SVLS V GP is SVLSF V, LLC. The members of the investment committee of SVLSF V, LLC are Kate Bingham, James Garvey, Eugene D. Hill, III,

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David Milne and Michael Ross, a member of our board of directors. SVLS V LP, SVLS V SPP, SVLS GP, SVLSF V, LLC and each of the individuals comprising the SVLSF V, LLC investment committee may be deemed to share voting, dispositive and investment power over the shares held of record by SVLS V LP and SVLS V SPP. Each of SVLS V LP, SVLS V SPP, SVLS V GP, SVLSF V, LLC and the individual members of the SVLSF V, LLC investment committee disclaim beneficial ownership of the shares owned directly by SVLS V LP and SVLS V SPP except to the extent of any pecuniary interest therein. The address for each of the foregoing entities and individuals, with the exception of Kate Bingham, is One Boston Place, Suite 3900, 201 Washington Street, Boston, Massachusetts 02108. The address for Kate Bingham is 71 Kingsway, London WC2B 6ST, United Kingdom. Also includes 24,094 shares of common stock issuable upon the exercise of options held by Mr. Ross exercisable within 60 days after September 30, 2018.

(13) Includes 1,175,802 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2018.

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EXECUTIVE COMPENSATION

This section describes the material elements of compensation awarded to, earned by or paid to Jill C. Milne, Joanne M. Donovan and Andrew Nichols, who together constitute all of our NEOs. This section also provides qualitative information regarding the manner and context in which compensation is awarded to and earned by our executive officers and is intended to place in perspective the data presented in the tables and narrative that follow.

Summary Compensation Table

The following table sets forth information regarding compensation earned in 2017 and 2016 by our NEOs.

Name and Principal Position	Year	Salary ($)	Bonus ($)(1)	Option Awards ($)(2)	All Other Compensation ($)(3)	Total ($)
Jill C. Milne, Ph.D.	2017	462,264		168,710	1,645	632,619
President and Chief Executive Officer	2016	453,200	163,152	431,230	1,822	1,049,404
Joanne M. Donovan, M.D., Ph.D.	2017	389,621		84,355	1,645	475,621
Chief Medical Officer	2016	381,982	130,256	321,806	1,822	835,866
Andrew Nichols, Ph.D.	2017	346,800		84,355	1,645	432,800
Chief Scientific Officer	2016	316,750	118,627	238,744	1,822	675,943

(1) The amounts reported in the "Bonus" column represent discretionary annual cash bonuses awarded to our NEOs.

(2) The amounts reported in the "Option Awards" column reflect the aggregate grant date fair value of share-based compensation awarded during the year computed in accordance with the provisions of Financial Accounting Standards Board ("***FASB***") Accounting Standard Codification ("***ASC***") Topic 718. See Note 13 to the consolidated financial statements included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 previously filed with the SEC.

(3) The amounts reported in the "All Other Compensation" column reflect, for each NEO, the cost to us of life insurance premiums paid for the NEO.

Overview/Compensation Philosophy

We operate in the highly competitive biotechnology industry, which is characterized by frequent scientific and technological advances, rapidly changing regulatory and market requirements, and the frequent emergence of new competitors. Our ability to attract and retain highly qualified managerial, scientific and medical personnel in this environment is essential to the achievement of our strategic and financial goals. We have embraced a compensation philosophy of offering our employees competitive compensation and benefits packages that are focused on long-term value creation and rewarding them for achieving our developmental, financial and strategic objectives, because we recognize the necessity of attracting and retaining individuals in our industry with the breadth of skills and experience required to develop, gain marketing approval of and commercialize products successfully.

We compete with many other companies, universities and research institutions in seeking to attract and retain a skilled team. To meet this challenge, we observe the following core principles in formulating our compensation policies and making compensation decisions:

- creating a direct and meaningful link between strategic business objectives and rewarding individual performance in the achievement of key goals and milestones to reach those objectives;

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providing for a performance-driven culture by setting clear, aggressive goals, rewarding outstanding performers to the extent those goals are achieved and making sure our best performers know clearly that we value their contributions;

providing equity awards that establish a clear alignment between the interests of our employees and our stockholders and enhance our employees' sense of ownership;

fostering a collaborative team culture centered on our principles of patient-focused drug development and commercialization, reinforced through our compensation and incentive programs;

ensuring that compensation plans and arrangements are simple to communicate and understand; and

offering total compensation that is competitive and fair.

Narrative Disclosure to Summary Compensation Table

We review compensation annually for all employees, including our executives. In setting executive base salaries and bonuses and granting equity incentive awards, we consider compensation for comparable positions in the market, the historical compensation levels of our executives, individual performance as compared to our expectations and objectives, our desire to motivate our employees to achieve short- and long-term results that are in the best interests of our stockholders, and a long-term commitment to our company. We do not target a specific competitive position or a specific mix of compensation among base salary, bonus or long-term incentives.

Our Chief Executive Officer typically proposes base salary, target bonuses, and equity incentive compensation for members of our executive team (excluding herself) to the compensation committee. Her proposals are based on our company's pay philosophy and methodology and in-line with executive compensation for similarly situated executives at peer companies. Our compensation committee then typically reviews and discusses the proposals with the Chief Executive Officer for all executives other than the Chief Executive Officer. The compensation committee, without the applicable members of management present, further discusses the Chief Executive Officer's recommendations and ultimately recommends for our board of directors' approval the base salary, target bonuses and equity incentive compensation of our executive officers for the current year, as well as the amount of executive officer cash bonuses for the prior year, based on the attainment of corporate and individual goals. The Chief Executive Officer is not present during voting or deliberations regarding her compensation by the compensation committee or the board of directors. During 2017, our compensation committee engaged Radford, an AON Hewitt company, as its independent compensation consultant, to review our executive compensation peer group and program design and assess our executives' compensation relative to comparable companies. Our compensation committee considered the relationship that Radford has with us, the members of our board of directors and our executive officers. Based on the committee's evaluation, the compensation committee has determined that no conflicts of interest existed between our company and Radford.

Radford assisted the committee in conducting a competitive compensation assessment for our executive officers for the fiscal year ended December 31, 2017. In evaluating the total compensation of our executive officers, the compensation committee, with the assistance of Radford, established a peer group of 19 publicly traded companies in the biopharmaceutical industry that was selected based on companies whose market capitalization, number of employees, maturity of product development pipeline and area of therapeutic focus are similar to ours.

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The peer group for our executive benchmarking as approved by the compensation committee for 2017 was comprised of the following companies:

Akebia Therapeutics, Inc.	Fate Therapeutics, Inc	Proteon Therapeutics, Inc.
aTyr Pharma, Inc.	Genocea Biosciences, Inc.	Regulus Therapeutics Inc.
Capricor Therapeutics, Inc.	GlycoMimetics, Inc.	Stemline Therapeutics, Inc.
Cellular Biomedicine Group, Inc.	Immune Design Corp.	Trevena, Inc.
ChemoCentryx, Inc.	Kura Oncology, Inc.	Vital Therapies, Inc.
Concert Pharmaceuticals, Inc.	Matinas BioPharma Holdings, Inc.	
Endocyte, Inc.	Mirati Therapeutics, Inc.	

Radford then supplemented the peer group information with published survey data, which provided a broader market representation of companies and deeper position reporting.

Base salary. In 2017, we paid annual base salaries to Dr. Milne, Dr. Donovan and Dr. Nichols in the amounts of $462,264, $389,621, and $346,800, respectively. These 2017 annual base salaries reflected a market-based merit increase from 2016 of 2%. These base salaries were determined using a competitive assessment of similarly situated executives at our peer companies to make them competitive with the 50th percentile, as well as to address customary annual base salary increases and to recognize their individual performance. We use base salaries to recognize the experience, skills, knowledge and responsibilities required of all our employees, including our NEOs. None of our NEOs is currently party to an employment agreement or other agreement or arrangement that provides for automatic or scheduled increases in base salary.

Annual bonus. Our board of directors may, in its discretion, award bonuses to our NEOs from time to time. We typically establish annual bonus targets based around a set of specified corporate goals for our NEOs, along with individual goals, and conduct an annual performance review to determine the attainment of such goals. Our compensation committee recommends and our board of directors approves target percentages of annual base salary for our NEOs based on target percentages for similar executives at our peer companies to make these percentages competitive with the 50th percentile, which for 2017 were 50%, 40% and 35% for Drs. Milne, Donovan and Nichols, respectively. Our management may propose bonus awards to the compensation committee or the board of directors primarily based on such review process and such target percentages. Our compensation committee makes a recommendation to the board of directors regarding eligibility requirements for and the amount of such bonus awards. With respect to 2017, we did not award or pay bonuses to Drs. Milne, Donovan or Nichols, as our board of directors, upon the recommendation of the compensation committee, determined to grant increased equity incentive compensation to our executive officers in lieu of cash bonuses as a means of reducing our cash expenditures.

Equity incentives. Although we do not have a formal policy with respect to the grant of equity incentive awards to our executive officers, or any formal equity ownership guidelines applicable to them, we believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. In addition, we believe that equity grants with a time-based vesting feature promote executive retention because this feature incentivizes our executive officers to remain in our employment during the vesting period. Accordingly, we typically grant stock option awards at the start of employment to each executive officer and our other employees and our compensation committee and board of directors periodically review the equity incentive compensation of our NEOs and other employees and from time to time may grant equity incentive awards to them in the form of stock options.

In 2017, our board of directors granted options to purchase 200,000, 100,000 and 100,000 shares of our common stock to Dr. Milne, Dr. Donovan and Dr. Nichols, respectively, as part of a review of

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their overall compensation. For grants in connection with initial employment, vesting begins on the initial date of employment. Time vested stock option grants to our executives and other employees typically vest 25% on the first anniversary of grant or, in the case of new hire grants, the initial employment date, if earlier, and 2.0833% per month thereafter, through the fourth anniversary of the vesting commencement date, and have a term of 10 years from the grant date. The exercise price of all options is equal to the fair market value of our common stock on the date of grant.

Outstanding Equity Awards at 2017 Fiscal Year End Table

The following table set forth information regarding outstanding equity awards held by our NEOs as of December 31, 2017.

	Option Awards			
Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Jill C. Milne, Ph.D.	84,276		$ 1.67	2/28/2021
	22,292		$ 2.31	12/17/2022
	32,477		$ 2.31	12/17/2022
	28,605		$ 2.31	4/16/2023
	57,149	1,216(1)	$ 6.81	3/18/2024
	6,420	2,918(2)	$ 11.05	3/25/2025
	96,667	63,333(3)	$ 14.05	7/16/2025
	47,208	55,792(4)	$ 4.57	2/10/2026
	14,063	30,937(5)	$ 4.31	9/7/2026
		200,000(6)	$ 1.24	2/8/2027
Joanne M. Donovan, M.D., Ph.D.	27,237		$ 1.93	9/6/2021
	7,204		$ 2.31	12/17/2022
	10,496		$ 2.31	12/17/2022
	24,584		$ 2.31	12/17/2022
	14,305		$ 2.31	4/16/2023
	24,764	527(1)	$ 6.81	3/18/2024
	3,210	1,459(2)	$ 11.05	3/25/2025
	30,250	35,750(4)	$ 4.57	2/10/2026
	14,063	30,937(5)	$ 4.31	9/7/2026
		100,000(6)	$ 1.24	2/8/2027
Andrew Nichols, Ph.D.	55,933	2,432(7)	$ 6.81	3/18/2024
	1,872	851(2)	$ 11.05	3/25/2025
	4,864	2,918(8)	$ 11.05	4/29/2025
	11,917	14,083(4)	$ 4.57	2/10/2026
	12,500	27,500(5)	$ 4.31	9/7/2026
	3,792	9,208(9)	$ 5.79	10/2/2026
		100,000(6)	$ 1.24	2/8/2027

(1) Became fully vested on January 1, 2018.

(2) The unvested awards are scheduled to vest in equal monthly installments through March 26, 2019.

(3) The unvested awards are scheduled to vest in equal monthly installments through July 8, 2019.

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(4) The unvested awards are scheduled to vest in equal monthly installments through February 11, 2020.

(5) The unvested awards are scheduled to vest in equal monthly installments through September 8, 2020

(6) 25% of the unvested awards vested on February 9, 2018. The remaining unvested awards are scheduled to vest in equal monthly installments through February 9, 2021.

(7) Became fully vested on February 16, 2018.

(8) The unvested awards are scheduled to vest in equal monthly installments through June 1, 2019.

(9) The unvested awards are scheduled to vest in equal monthly installments through October 3, 2020.

Employment Agreements, Severance and Change in Control Arrangements

Employment Agreements with Current NEOs

We have entered into an employment agreement with Dr. Milne, dated as of April 7, 2010. The employment agreement confirms Dr. Milne's title, compensation arrangements and eligibility for benefits made available to employees generally. The employment agreement with Dr. Milne provides that she is eligible to receive an annual cash bonus, as determined by our board of directors in its sole discretion, with a target of 40% of her annual base salary earned in such particular calendar year, which percentage shall be subject to adjustment from time to time by the board of directors in its sole discretion. The board of directors has approved for 2018 a target cash bonus (expressed as a percentage of base salary) of up to 50% for Dr. Milne based on its assessment of our company's performance against established annual goals.

Our board of directors has approved for 2018 a target cash bonus of up to 40% of annual base salary for Dr. Donovan and up to 35% of annual base salary for Dr. Nichols, as determined in the sole discretion of the board of directors, based on its assessment of their respective performance and that of our company against established annual goals.

Each of Drs. Milne, Donovan and Nichols is an employee at will and is entitled to certain benefits upon termination pursuant to our Severance Benefits Plan (the "***Severance Plan***"), which was adopted by our board of directors in April 2016, as further described below. In connection with the adoption of the Severance Plan, each of Drs. Milne, Donovan and Nichols has acknowledged that their entitlement to severance benefits is governed by the terms of the Severance Plan and that any terms of their employment agreement or offer letter, as applicable, relating to severance have been superseded in their entirety by the terms of the Severance Plan.

Severance Plan

The Severance Plan provides eligible full time executives holding the title of vice president or above ("***Covered Employees***") certain severance benefits upon a termination without cause (as defined in the Severance Plan) or a resignation for good reason (as defined in the Severance Plan), including in each case within one year following a change in control (as defined in the Severance Plan) (each, a "***Covered Termination***"). Pursuant to the Severance Plan, each Covered Employee who is subject to a Covered Termination is entitled to:

- continuation of such Covered Employee's monthly base salary (as defined in the Severance Plan) for a period ranging from six months to 18 months (the "***Severance Period***") following such termination depending on the title/role of the Covered Employee and the type of Covered Termination;

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payment by us of a portion of the cost of COBRA continuation of benefits coverage for the Covered Employee and his or her applicable dependents for no longer than the Covered Employee's applicable Severance Period or until the Covered Employee commences new employment and is eligible for new plan coverage, if sooner, subject to certain conditions set forth in the Severance Plan;

any unpaid annual bonus in respect to any completed bonus period which has ended prior to the date of the Covered Employee's Covered Termination and which our board of directors deems granted to the Covered Employee in its discretion pursuant to our contingent compensation program;

in the case of our chief executive officer, a bonus amount equal to one-half of the average annual bonus paid to the chief executive officer over the three calendar years preceding the calendar year in which the Covered Termination occurs, which bonus shall be prorated to reflect the number of days served in the calendar year in which such Covered Termination occurs; and

in the case of a change in control termination, full vesting of any unvested equity awards.

Receipt of any severance benefits under the Severance Plan requires that the Covered Employee: (a) comply with the provisions of any applicable noncompetition, nonsolicitation, and other obligations to us; and (b) execute and deliver a suitable waiver and release under which the Covered Employee releases and discharges us and our affiliates from and on account of any and all claims that relate to or arise out of the employment relationship between us and the Covered Employee, which release will become binding within 60 days following the Covered Employee's termination of employment. If a Covered Employee dies following a Covered Termination but before such Covered Employee has received all of the severance benefits to which such Covered Employee is entitled under the Severance Plan, the remaining payments will be made to the Covered Employee's designated beneficiary or estate.

The Severance Plan provides that the following employees will not be eligible for severance benefits, except to the extent specifically determined otherwise by the Severance Plan's administrator:

an employee who is terminated for cause (as defined in the Severance Plan);

an employee who retires, terminates employment as a result of an inability to perform his or her duties due to physical or mental disability or dies;

an employee who voluntarily terminates his or her employment, except in the case of a Covered Termination for good reason (as defined in the Severance Plan);

an employee who is employed for a specific period of time in accordance with the terms of a written employment agreement; and

an employee who promptly becomes employed by another member of the controlled group of entities of which we (or our successor in the change in control (as defined in the Severance Plan)) is a member as defined in Sections 414(b) and (c) of the Code.

The Severance Plan provides for recoupment of severance benefits under specified circumstances if the Covered Employee fails to comply with the terms of the Severance Plan.

The Severance Plan supersedes (i) existing severance plans and separation policies applying to Covered Employees with respect to any termination that would constitute a Covered Termination and (ii) the provisions of any agreements between any Covered Employee and us that provide for severance benefits.

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The following table summarizes the schedule of severance payments our NEOs would have received, assuming a qualifying termination occurred on December 31, 2017.

Name	Cash Severance ($)(1)	Bonus ($)(2)	COBRA Continuation ($)(3)	Value of Accelerated Vesting of Equity Awards ($)(4)	Total ($)
Jill C. Milne, Ph.D.					
Termination without cause or upon resignation with good reason	462,264	53,592	22,890		538,746
Termination upon a change in control	693,396	53,592	34,336	50,000	831,324
Joanne M. Donovan, M.D., Ph.D.					
Termination without cause or upon resignation with good reason	389,621		22,890		412,511
Termination upon a change in control	389,621		22,890	25,000	437,511
Andrew Nichols, Ph.D.					
Termination without cause or upon resignation with good reason	346,800		22,890		369,690
Termination upon a change in control	346,800		22,890	25,000	394,690

(1) These amounts represent, in the case of Dr. Milne, 12 months' base salary for a termination without cause or resignation with good reason and 18 months' base salary for a termination upon a change of control; and, in the case of Dr. Donovan and Dr. Nichols, 12 months' base salary; each at the rate in effect immediately prior to the executive's termination of employment.

(2) These amounts represent 50% of the average performance bonus received by Dr. Milne for the three most recently completed years.

(3) These amounts represent paid health coverage for 12 months and, in the case of Dr. Milne for a change in control termination, 18 months' paid health coverage.

(4) The values of accelerated vesting of equity awards included in the table above are based on the intrinsic values of such unvested awards on December 31, 2017 (i.e., the difference between the closing price of our common stock on the Nasdaq Global Market on that date and the exercise price multiplied by the number of shares for which vesting would have been accelerated).

We have also entered into employee confidentiality, non-competition and proprietary information agreements with each of our NEOs. Under the employee confidentiality, non-competition and proprietary information agreements, each NEO has agreed (1) not to compete with us during his or her employment and for a period of 18 months after the termination of his or her employment, (2) not to solicit our employees during his or her employment and for a period of 18 months after the termination of his or her employment, (3) to protect our confidential and proprietary information and (4) to assign to us related intellectual property developed during the course of his or her employment.

401(k) Retirement Plan

We maintain a 401(k) retirement plan that is intended to be a tax-qualified defined contribution plan under Section 401(k) of the Code. In general, all of our employees are eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan includes a salary deferral arrangement pursuant to which participants may elect to reduce their current compensation by up to the statutorily prescribed limit, equal to $18,500 in 2018, and have the

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amount of the reduction contributed to the 401(k) plan. Participants over the age of 50 are entitled to an additional catch-up contribution up to the statutorily prescribed limit, equal to $6,000 in 2018.

Securities Authorized for Issuance under Equity Compensation Plans

The following table contains information about our equity compensation plans as of December 31, 2017:

Plan category	Number of securities to be issued upon exercise of outstanding stock options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	2,845,626(1)	$ 4.53	824,165(2)
Equity compensation plans not approved by security holders			
Total	2,845,626	$ 4.53	824,165

(1) Consists of stock options outstanding as of December 31, 2017 under the 2008 Plan and the 2015 Plan.

(2) Consists of shares issuable under the 2015 Plan and our 2015 Employee Stock Purchase Plan, but does not reflect automatic increases that were effective as of January 1, 2018 of 945,810 shares and 236,452 shares under the respective plans. The 2015 Plan provides for further annual increases, to be added as of the first day of each fiscal year, from January 1, 2019 until, and including, January 1, 2025, equal to the lowest of 1,297,334 shares of our common stock, 4% of the number of shares of our common stock outstanding on such first day of the fiscal year in question and an amount determined by our board of directors. If the Amended and Restated 2015 Plan is approved by stockholders these annual increases will be eliminated and the number of shares of common stock authorized for issuance under the 2015 Plan will be increased by 8,500,000 shares on a pre-Reverse Stock Split basis. Our 2015 Employee Stock Purchase Plan provides for further annual increases, to be added as of the first day of each fiscal year, from January 1, 2019 until, and including, January 1, 2026, in an amount equal to the least of 364,705 shares of our common stock, 1% of the total number of shares of our common stock outstanding on the first day of the applicable year, and an amount determined by our board of directors.

DIRECTOR COMPENSATION

We do not provide any compensation to Dr. Milne, our President and Chief Executive Officer, for her service as a director. Dr. Milne's compensation as an executive officer is set forth below under "Executive Compensation Summary Compensation Table."

In February 2016, our board of directors adopted an amended director compensation program, which became effective as of January 1, 2016. Under this director compensation program, we pay our non-employee directors a cash retainer for service on our board of directors and for service on each committee on which the director is a member. The Co-Chairmen of the board of directors and the chairman of each committee receive higher retainers for such service. These fees are payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment is prorated for any portion of such quarter that the director is not serving on our board of

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directors. The fees paid to non-employee directors for service on the board of directors and for service on each committee of the board of directors on which the director is a member are as follows:

	Member Annual Fee	Chairman Incremental Annual Fee
Board of Directors	$ 35,000	$ 35,000(1)
Audit Committee	7,500	12,500
Compensation Committee	5,000	5,000
Nominating and Corporate Governance Committee	3,750	3,750
Science and Technology Committee	5,000	5,000

(1) In the event co-chairmen are appointed, the retainer for Chairman of the board will be divided equally between the co-chairmen.

We also reimburse our non-employee directors for reasonable travel and out-of-pocket expenses incurred in connection with attending our board of directors and committee meetings.

In February 2018, our board of directors adopted an amended non-employee director equity compensation program, effective as of January 1, 2018. Under the amended non-employee director equity compensation program, each new non-employee director elected to our board of directors receives an option to purchase 28,000 shares of our common stock, which option vests in equal annual installments over a three-year period measured from the date of grant, subject to the director's continued service as a director. Further, on the date of the first board of directors meeting held after each annual meeting of stockholders, each non-employee director that has served on our board of directors for at least six months will receive an option to purchase 14,000 shares of our common stock. Each of these options will vest in full after a one-year period measured from the date of grant, subject to the director's continued service as a director. The exercise price of all options granted to directors will equal the fair market value of our common stock on the date of grant. Options granted to non-employee directors become exercisable in full upon a change in control of our company.

This policy is intended to provide a total compensation package that enables us to attract and retain qualified and experienced individuals to serve as directors and to align our directors' interests with those of our stockholders.

The following table sets forth information regarding compensation earned by our non-employee directors during 2017. Dr. Galakatos' term as a Class II director expired at our 2017 annual meeting of stockholders in June 2017, and he did not stand for reelection.

Name	Fees Earned or Paid In Cash ($)	Option Awards ($)(1)	Total ($)
Michael Ross, Ph.D.	72,500	5,622	78,122
Nicholas Galakatos, Ph.D.	35,015		35,015
Jean George	40,160	5,622	45,783
Kenneth Bate	77,500	5,622	83,122
Burt Adelman, M.D.	45,000	5,622	50,622
Michael Kishbauch	45,318	5,622	50,940

(1) The amounts included in the "Option Awards" column reflect the aggregate grant date fair value of awards granted during 2017 calculated in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 13 to the consolidated financial

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statements included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 previously filed with the SEC. As of December 31, 2017:

Dr. Ross held stock options to purchase an aggregate of 24,094 shares of common stock, 13,896 shares of which were vested as of December 31, 2017; 3,698 of the shares are scheduled to vest on June 30, 2018, and 6,500 of the shares are scheduled to vest on June 7, 2018;

Ms. George held stock options to purchase an aggregate of 24,094 shares of common stock, 13,896 shares of which were vested as of December 31, 2016; 3,698 of the shares are scheduled to vest on June 30, 2018, and 6,500 of the shares are scheduled to vest on June 7, 2018;

Mr. Bate held stock options to purchase an aggregate of 33,977 shares of common stock, 23,573 shares of which were vested as of December 31, 2017; 206 of the shares vested on January 1, 2018; 3,698 shares are scheduled to vest on June 30, 2018; and 6,500 of the shares are scheduled to vest on June 7, 2018;

Dr. Adelman held stock options to purchase an aggregate of 19,500 shares of common stock, 4,333 of which were vested as of December 31, 2017; 4,333 of the shares vested on April 5, 2018; 6,500 of the shares are scheduled to vest on June 7, 2018; and 4,334 of the shares are scheduled to vest on April 5, 2019.

Mr. Kishbauch held stock options to purchase an aggregate of 19,500 shares of common stock, 4,333 of which were vested as of December 31, 2017; 4,333 of the shares vested on April 5, 2018; 6,500 of the shares are scheduled to vest on June 7, 2018; and 4,334 of the shares are scheduled to vest on April 5, 2019.

Compensation Committee Interlocks and Insider Participation

During 2017, the members of our compensation committee were Mr. Bate and Dr. Nicholas Galakatos through June 7, 2017, and Mr. Kishbauch, Mr. Bate and Ms. George thereafter, each of whom is an independent director or, in the case of Dr. Galakatos, was an independent director prior to his departure from our board. None of our executive officers served as a director or a member of a compensation committee (or other committee serving an equivalent function) of any other entity, one of whose executive officers served as a director or member of our compensation committee during the fiscal year ended December 31, 2017.

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HOUSEHOLDING

Some banks, brokers and other nominee record holders may be participating in the practice of "householding" proxy statements and annual reports. This means that only one copy of our documents, including the annual report to stockholders and proxy statement, may have been made available to multiple stockholders in your household. We will promptly deliver a separate copy of either document to you upon written or oral request to Catabasis Pharmaceuticals, Inc., One Kendall Square, Building 1400E, Suite B14202, Cambridge, MA 02139, Attention: Corporate Secretary, or telephone: (617) 349-1971. If you want to receive separate copies of the proxy statement or annual report to stockholders in the future, or if you are receiving multiple copies and would like to receive only one copy per household, you should contact your bank, broker or other nominee record holder, or you may contact us at the above address and phone number.

STOCKHOLDER PROPOSALS

A stockholder who would like to have a proposal considered for inclusion in our proxy statement for our 2019 Annual Meeting must submit the proposal in accordance with the procedures outlined in Rule 14a-8 of the Exchange Act so that it is received by us no later than December 27, 2018, which is 120 days prior to the first anniversary of the mailing date of the proxy statement for our 2018 Annual Meeting of Stockholders. However, if the date of our 2019 Annual Meeting is changed by more than 30 days from the date of our 2018 Annual Meeting of Stockholders, then the deadline is a reasonable time before we begin to print and send our proxy statement for our 2019 Annual Meeting. SEC rules set standards for eligibility and specify the types of stockholder proposals that may be excluded from a proxy statement.

If a stockholder wishes to propose a nomination of persons for election to our board of directors or present a proposal at an annual meeting but does not wish to have the proposal considered for inclusion in our proxy statement and proxy card, our amended and restated bylaws establish an advance notice procedure for such nominations and proposals. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors or by a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has delivered timely notice in proper form to our corporate secretary of the stockholder's intention to bring such business before the meeting.

The required notice must be in writing and received by our corporate secretary at our principal executive offices not less than 90 days nor more than 120 days prior to the first anniversary of the preceding year's annual meeting. However, in the event that the date of the annual meeting is advanced by more than 30 days, or delayed by more than 60 days, from the first anniversary of the preceding year's annual meeting, a stockholder's notice must be so received no earlier than the 120th day prior to such annual meeting and not later than the close of business on the later of (A) the 90th day prior to such annual meeting and (B) the tenth day following the day on which notice of the date of such annual meeting was mailed or public disclosure of the date of such annual meeting was made, whichever first occurs. For stockholder proposals to be brought before our 2019 Annual Meeting, the required notice must be received by our corporate secretary at our principal executive offices no earlier than February 7, 2019 and no later than March 9, 2019.

Stockholder proposals should be addressed to Catabasis Pharmaceuticals, Inc., Attention: Secretary, One Kendall Square, Building 1400E, Suite B14202, Cambridge, MA 02139, Attention: Corporate Secretary.

OTHER MATTERS

Our board of directors does not know of any other matters to be brought before the Special Meeting. If any other matters not mentioned in this proxy statement are properly brought before the

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meeting, the individuals named in the proxy made available to stockholders intend to use their discretionary voting authority under the proxy to vote the proxy in accordance with their best judgment on those matters.

By Order of the Board of Directors

Jill C. Milne, Ph.D.
President and Chief Executive Officer

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Appendix A

CERTIFICATE OF AMENDMENT

TO

RESTATED CERTIFICATE OF INCORPORATION

OF

CATABASIS PHARMACEUTICALS, INC.

Pursuant to Section 242 of the
General Corporation Law of the State of Delaware

Catabasis Pharmaceuticals, Inc. (hereinafter called the "Corporation"), a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify as follows:

A resolution was duly adopted by the Board of Directors of the Corporation pursuant to Section 242 of the General Corporation Law of the State of Delaware setting forth an amendment to the Restated Certificate of Incorporation of the Corporation and declaring said amendment to be advisable. The stockholders of the Corporation duly approved and adopted said proposed amendment at a special meeting of stockholders in accordance with Section 242 of the General Corporation Law of the State of Delaware. The resolution setting forth the amendment is as follows:

RESOLVED: That the first sentence of Article FOURTH of the Restated Certificate of Incorporation of the Corporation be and hereby is deleted in its entirety and the following three paragraphs are inserted in lieu thereof:

"FOURTH: That, effective on the filing of this Certificate of Amendment to Restated Certificate of Incorporation with the Secretary of State of the State of Delaware (the "Effective Time"), a one-for-[ ](1) reverse stock split of the Corporation's common stock, $0.001 par value per share (the "Common Stock"), shall become effective, pursuant to which each [ ](1) shares of Common Stock outstanding and held of record by each stockholder of the Corporation (including treasury shares) immediately prior to the Effective Time shall be reclassified and combined into one validly issued, fully paid and nonassessable share of Common Stock automatically and without any action by the holder thereof upon the Effective Time and shall represent one share of Common Stock from and after the Effective Time (such reclassification and combination of shares, the "Reverse Stock Split"). The par value of the Common Stock following the Reverse Stock Split shall remain at $0.001 per share. No fractional shares of Common Stock shall be issued as a result of the Reverse Stock Split and, in lieu thereof, upon surrender after the Effective Time of a certificate or book entry position which formerly represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time, any person who would otherwise be entitled to a fractional share of Common Stock as a result of the Reverse Stock Split, following the Effective Time, shall be entitled to receive a cash payment equal to the fraction of a share of Common Stock to which such holder would otherwise be entitled multiplied by the closing price per share of the Common Stock on the Nasdaq Global Market at the close of business on the date of the Effective Time.

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(1) Shall be a number greater than five and equal to or lesser than fifteen and shall include not more than four decimal digits.

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Each stock certificate or book entry position that, immediately prior to the Effective Time, represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall, from and after the Effective Time, automatically and without the necessity of presenting the same for exchange, represent that number of whole shares of Common Stock after the Effective Time into which the shares formerly represented by such certificate or book entry position have been reclassified (as well as the right to receive cash in lieu of fractional shares of Common Stock after the Effective Time); provided, however, that each person of record holding a certificate or book entry position that represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall receive, upon surrender of such certificate or book entry position, a new certificate or book entry position evidencing and representing the number of whole shares of Common Stock after the Effective Time into which the shares of Common Stock formerly represented by such certificate or book entry position shall have been reclassified.

The total number of shares of all classes of stock which the Corporation shall have authority to issue is 155,000,000 shares, consisting of (i) 150,000,000 shares of Common Stock and (ii) 5,000,000 shares of Preferred Stock, $0.001 par value per share ("Preferred Stock")."

IN WITNESS WHEREOF, the Corporation has caused its corporate seal to be affixed hereto and this Certificate of Amendment to be signed by its President this day of , 201 .

CATABASIS PHARMACEUTICALS, INC.

By: _____

Jill C. Milne, *President*

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Appendix B

CATABASIS PHARMACEUTICALS, INC.

AMENDED AND RESTATED

2015 STOCK INCENTIVE PLAN

1. Purpose

The purpose of this 2015 Stock Incentive Plan (the "***Plan***") of Catabasis Pharmaceuticals, Inc., a Delaware corporation (the "***Company***"), is to advance the interests of the Company's stockholders by enhancing the Company's ability to attract, retain and motivate persons who are expected to make important contributions to the Company and by providing such persons with equity ownership opportunities and performance-based incentives that are intended to better align the interests of such persons with those of the Company's stockholders. Except where the context otherwise requires, the term "***Company***" shall include any of the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Internal Revenue Code of 1986, as amended, and any regulations thereunder (the "***Code***") and any other business venture (including, without limitation, joint venture or limited liability company) in which the Company has a controlling interest, as determined by the Board of Directors of the Company (the "***Board***").

2. Eligibility

All of the Company's employees, officers and directors, as well as consultants and advisors to the Company (as such terms are defined and interpreted for purposes of Form S-8 under the Securities Act of 1933, as amended (the "***Securities Act***"), or any successor form) are eligible to be granted Awards under the Plan. Each person who is granted an Award under the Plan is deemed a "***Participant***." "***Award***" means Options (as defined in Section 5), SARs (as defined in Section 6), Restricted Stock (as defined in Section 7), Restricted Stock Units (as defined in Section 7) and Other Stock-Based Awards (as defined in Section 8).

3. Administration and Delegation

(a) Administration by Board of Directors. The Plan will be administered by the Board. The Board shall have authority to grant Awards and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Board may construe and interpret the terms of the Plan and any Award agreements entered into under the Plan. The Board may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem expedient and it shall be the sole and final judge of such expediency. All decisions by the Board shall be made in the Board's sole discretion and shall be final and binding on all persons having or claiming any interest in the Plan or in any Award.

(b) Appointment of Committees. To the extent permitted by applicable law, the Board may delegate any or all of its powers under the Plan to one or more committees or subcommittees of the Board (a "***Committee***"). All references in the Plan to the "***Board***" shall mean the Board or a Committee of the Board or the officers referred to in Section 3(c) to the extent that the Board's powers or authority under the Plan have been delegated to such Committee or officers.

(c) Delegation to Officers. To the extent permitted by applicable law, the Board may delegate to one or more officers of the Company the power to grant Options and other Awards that constitute rights under Delaware law (subject to any limitations under the Plan) to employees or officers of the Company and to exercise such other powers under the Plan as the Board may determine, *provided* that the Board shall fix the terms of such Awards to be granted by such officers (including the exercise price of such Awards, which may include a formula by which the exercise price will be determined) and the maximum number of shares subject to such Awards that the officers may grant; *provided further*,

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however, that no officer shall be authorized to grant such Awards to any "executive officer" of the Company (as defined by Rule 3b-7 under the Securities Exchange Act of 1934, as amended (the "***Exchange Act***")) or to any "officer" of the Company (as defined by Rule 16a-1 under the Exchange Act). The Board may not delegate authority under this Section 3(c) to grant Restricted Stock, unless Delaware law then permits such delegation.

4. Stock Available for Awards

(a) Number of Shares; Share Counting.

(1) Authorized Number of Shares. Subject to adjustment under Section 9, Awards may be made under the Plan (any or all of which Awards may be in the form of Incentive Stock Options, as defined in Section 5(b)) for up to such number of shares of common stock, $0.001 par value per share, of the Company (the "***Common Stock***") as is equal to the sum of:

(A) ~~13,727,495~~***11,879,330*** shares of Common Stock; plus

(B) such additional number of shares of Common Stock (up to ~~19,334,779~~***1,504,652*** shares) as is equal to the sum of (x) ~~the number of~~***25,942*** shares of Common Stock reserved for issuance under the Company's 2008 Equity Incentive Plan (the "***Existing Plan***") that remain***ed*** available for grant under the Existing Plan immediately prior to the closing of the Company's initial public offering and (y) the number of shares of Common Stock subject to awards granted under the Existing Plan which awards expire, terminate or are otherwise surrendered, canceled, forfeited or repurchased by the Company at their original issuance price pursuant to a contractual repurchase right (subject, however, in the case of Incentive Stock Options to any limitations of the Code~~); plus~~).

~~(C) an annual increase to be added on the first day of each fiscal year, beginning with the fiscal year ending December 31, 2016 and continuing for each fiscal year until, and including, the fiscal year ending December 31, 2025, equal to the least of (i) 16,670,752 shares of Common Stock, (ii) 4% of the outstanding shares on such date and (iii) an amount determined by the Board.~~

Shares issued under the Plan may consist in whole or in part of authorized but unissued shares or treasury shares.

(2) Share Counting. For purposes of counting the number of shares available for the grant of Awards under the Plan:

(A) all shares of Common Stock covered by SARs shall be counted against the number of shares available for the grant of Awards under the Plan; *provided, however*, that (i) SARs that may be settled only in cash shall not be so counted and (ii) if the Company grants an SAR in tandem with an Option for the same number of shares of Common Stock and provides that only one such Award may be exercised (a "***Tandem SAR***"), only the shares covered by the Option, and not the shares covered by the Tandem SAR, shall be so counted, and the expiration of one in connection with the other's exercise will not restore shares to the Plan;

(B) if any Award (i) expires or is terminated, surrendered or canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right) or (ii) results in any Common Stock not being issued ~~(including as a result of an SAR that was settleable either in cash or in stock actually being settled in cash)~~**.** the unused Common Stock covered by such Award shall again be available for the grant of Awards; *provided, however*, that (1) in the case of Incentive Stock Options, the foregoing shall be subject to any limitations under the Code, (2) in the case of

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the exercise of an SAR, the number of shares counted against the shares available under the Plan shall be the full number of shares subject to the SAR multiplied by the percentage of the SAR actually exercised, regardless of the number of shares actually used to settle such SAR upon exercise and (3) the shares covered by a Tandem SAR shall not again become available for grant upon the expiration or termination of such Tandem SAR; and

(C) shares of Common Stock delivered (by actual delivery, attestation, or net exercise) to the Company by a Participant to (i) purchase shares of Common Stock upon the exercise of an Award or (ii) satisfy tax withholding obligations (including shares retained from the Award creating the tax obligation) shall ***not*** be added back to the number of shares available for the future grant of Awards.

(b) Substitute Awards. In connection with a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Board may grant Awards in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof. Substitute Awards may be granted on such terms as the Board deems appropriate in the circumstances, notwithstanding any limitations on Awards contained in the Plan. Substitute Awards shall not count against the overall share limit set forth in Section 4(a)(1), except as may be required by reason of Section 422 and related provisions of the Code.

5. Stock Options

(a) General. The Board may grant options to purchase Common Stock (each, an "***Option***") and determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to applicable federal or state securities laws, as it considers necessary or advisable.

(b) Incentive Stock Options. An Option that the Board intends to be an "incentive stock option" as defined in Section 422 of the Code (an "***Incentive Stock Option***") shall only be granted to employees of Catabasis Pharmaceuticals, Inc., any of Catabasis Pharmaceuticals, Inc.'s present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Code, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code, and shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. An Option that is not intended to be an Incentive Stock Option shall be designated a "***Nonstatutory Stock Option***." The Company shall have no liability to a Participant, or any other party, if an Option (or any part thereof) that is intended to be an Incentive Stock Option is not an Incentive Stock Option or if the Company converts an Incentive Stock Option to a Nonstatutory Stock Option.

(c) Exercise Price. The Board shall establish the exercise price of each Option and specify the exercise price in the applicable Option agreement. The exercise price shall be not less than 100% of the fair market value per share of Common Stock as determined by (or in a manner approved by) the Board ("***Fair Market Value***") on the date the Option is granted; *provided* that if the Board approves the grant of an Option with an exercise price to be determined on a future date, the exercise price shall be not less than 100% of the Fair Market Value on such future date.

(d) Duration of Options. Each Option shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable option agreement; *provided, however*, that no Option will be granted with a term in excess of 10 years.

(e) Exercise of Options. Options may be exercised by delivery to the Company of a notice of exercise in a form (which may be electronic) approved by the Company, together with payment in full (in the manner specified in Section 5(f)) of the exercise price for the number of shares for which the Option is exercised. Shares of Common Stock subject to the Option will be delivered by the Company as soon as practicable following exercise.

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(f) Payment Upon Exercise. Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for as follows:

(1) in cash or by check, payable to the order of the Company;

(2) except as may otherwise be provided in the applicable Option agreement or approved by the Board, in its sole discretion, by (i) delivery of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding or (ii) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(3) to the extent provided for in the applicable Option agreement or approved by the Board, in its sole discretion, by delivery (either by actual delivery or attestation) of shares of Common Stock owned by the Participant valued at their Fair Market Value, provided (i) such method of payment is then permitted under applicable law, (ii) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Board in its discretion and (iii) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements;

(4) to the extent provided for in the applicable Nonstatutory Stock Option agreement or approved by the Board in its sole discretion, by delivery of a notice of "net exercise" to the Company, as a result of which the Participant would receive (i) the number of shares underlying the portion of the Option being exercised, less (ii) such number of shares as is equal to (A) the aggregate exercise price for the portion of the Option being exercised divided by (B) the Fair Market Value on the date of exercise;

(5) to the extent permitted by applicable law and provided for in the applicable Option agreement or approved by the Board, in its sole discretion, by payment of such other lawful consideration as the Board may determine; or

(6) by any combination of the above permitted forms of payment.

(g) Limitation on Repricing. Unless such action is approved by the Company's stockholders, the Company may not (except as provided for under Section 9): (1) amend any outstanding Option granted under the Plan to provide an exercise price per share that is lower than the then-current exercise price per share of such outstanding Option, (2) cancel any outstanding option (whether or not granted under the Plan) and grant in substitution therefor new Awards under the Plan (other than Awards granted pursuant to Section 4(b)) covering the same or a different number of shares of Common Stock and having an exercise price per share lower than the then-current exercise price per share of the cancelled option, (3) cancel in exchange for a cash payment any outstanding Option with an exercise price per share above the then-current Fair Market Value, or (4) take any other action under the Plan that constitutes a "repricing" within the meaning of the rules of the NASDAQ Stock Market ("***NASDAQ***").

(h) ***No Dividend Equivalents.*** ***No Option shall provide for the payment or accrual of dividend equivalents.***

6. Stock Appreciation Rights

(a) General. The Board may grant Awards consisting of stock appreciation rights ("***SARs***") entitling the holder, upon exercise, to receive an amount of Common Stock or cash or a combination thereof (such form to be determined by the Board) determined by reference to appreciation, from and after the date of grant, in the Fair Market Value of a share of Common Stock over the measurement price established pursuant to Section 6(b). The date as of which such appreciation is determined shall be the exercise date.

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(b) Measurement Price. The Board shall establish the measurement price of each SAR and specify it in the applicable SAR agreement. The measurement price shall not be less than 100% of the Fair Market Value on the date the SAR is granted; *provided* that if the Board approves the grant of an SAR effective as of a future date, the measurement price shall be not less than 100% of the Fair Market Value on such future date.

(c) Duration of SARs. Each SAR shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable SAR agreement; *provided, however*, that no SAR will be granted with a term in excess of 10 years.

(d) Exercise of SARs. SARs may be exercised by delivery to the Company of a notice of exercise in a form (which may be electronic) approved by the Company, together with any other documents required by the Board.

(e) Limitation on Repricing. Unless such action is approved by the Company's stockholders, the Company may not (except as provided for under Section 9): (1) amend any outstanding SAR granted under the Plan to provide a measurement price per share that is lower than the then-current measurement price per share of such outstanding SAR, (2) cancel any outstanding SAR (whether or not granted under the Plan) and grant in substitution therefor new Awards under the Plan (other than Awards granted pursuant to Section 4(b)) covering the same or a different number of shares of Common Stock and having an exercise or measurement price per share lower than the then-current measurement price per share of the cancelled SAR, (3) cancel in exchange for a cash payment any outstanding SAR with a measurement price per share above the then-current Fair Market Value, or (4) take any other action under the Plan that constitutes a "repricing" within the meaning of the rules of NASDAQ.

(f) ***No Dividend Equivalents.*** ***No SAR shall provide for the payment or accrual of dividend equivalents.***

7. Restricted Stock; Restricted Stock Units

(a) General. The Board may grant Awards entitling recipients to acquire shares of Common Stock ("***Restricted Stock***"), subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeiture of such shares if issued at no cost) from the recipient in the event that conditions specified by the Board in the applicable Award are not satisfied prior to the end of the applicable restriction period or periods established by the Board for such Award. The Board may also grant Awards entitling the recipient to receive shares of Common Stock or cash to be delivered at the time such Award vests ("***Restricted Stock Units***") (Restricted Stock and Restricted Stock Units are each referred to herein as a "***Restricted Stock Award***").

(b) Terms and Conditions for All Restricted Stock Awards. The Board shall determine the terms and conditions of a Restricted Stock Award, including the conditions for vesting and repurchase (or forfeiture) and the issue price, if any.

(c) Additional Provisions Relating to Restricted Stock.

(1) Dividends. ~~Unless otherwise provided in the applicable Award agreement, any~~***Any*** dividends (whether paid in cash, stock or property) declared and paid by the Company with respect to shares of Restricted Stock ("***Accrued Dividends***") shall be paid to the Participant only if and when such shares become free from the restrictions on transferability and forfeitability that apply to such shares. Each payment of Accrued Dividends will be made no later than the end of the calendar year in which the dividends are paid to stockholders of that class of stock or, if later, the 15th day of the third month following the lapsing of the restrictions on transferability and the forfeitability provisions applicable to the underlying shares of Restricted Stock.

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(2) Stock Certificates. The Company may require that any stock certificates issued in respect of shares of Restricted Stock, as well as dividends or distributions paid on such Restricted Stock, shall be deposited in escrow by the Participant, together with a stock power endorsed in blank, with the Company (or its designee). At the expiration of the applicable restriction periods, the Company (or such designee) shall deliver the certificates no longer subject to such restrictions to the Participant or if the Participant has died, to his or her Designated Beneficiary. "***Designated Beneficiary***" means (i) the beneficiary designated, in a manner determined by the Board, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death or (ii) in the absence of an effective designation by a Participant, the Participant's estate.

(d) Additional Provisions Relating to Restricted Stock Units.

(1) Settlement. Upon the vesting of and/or lapsing of any other restrictions (i.e., settlement) with respect to each Restricted Stock Unit, the Participant shall be entitled to receive from the Company such number of shares of Common Stock or (if so provided in the applicable Award agreement) an amount of cash equal to the Fair Market Value of such number of shares of Common Stock as are set forth in the applicable Restricted Stock Unit agreement. The Board may, in its discretion, provide that settlement of Restricted Stock Units shall be deferred, on a mandatory basis or at the election of the Participant in a manner that complies with Section 409A of the Code.

(2) Voting Rights. A Participant shall have no voting rights with respect to any Restricted Stock Units.

(3) Dividend Equivalents. The Award agreement for Restricted Stock Units may provide Participants with the right to receive an amount equal to any dividends or other distributions declared and paid on an equal number of outstanding shares of Common Stock ("***Dividend Equivalents***"). Dividend Equivalents may be settled in cash and/or shares of Common Stock and shall be subject to the same restrictions on transfer and forfeitability as***, and the payment of such Dividend Equivalents shall be subject to the vesting of,*** the Restricted Stock Units with respect to which paid~~, in each case to the extent provided in the Award agreement~~.

8. Other Stock-Based Awards

(a) General. Other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock or other property, may be granted hereunder to Participants ("***Other Stock-Based Awards***"). Such Other Stock-Based Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan or as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock-Based Awards may be paid in shares of Common Stock or cash, as the Board shall determine. ***Any Dividend Equivalents awarded with respect to Other Stock-Based Awards shall be subject to the same restrictions on transfer and forfeitability as, and the payment of such Dividend Equivalents shall be subject to the vesting of, the Award with respect to which granted.***

(b) Terms and Conditions. Subject to the provisions of the Plan, the Board shall determine the terms and conditions of each Other Stock-Based Award, including any purchase price applicable thereto.

9. Adjustments for Changes in Common Stock and Certain Other Events

(a) Changes in Capitalization. In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under the Plan, (ii) the share

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counting rules set forth in Section 4(a), (iii) the number and class of securities and exercise price per share of each outstanding Option, (iv) the share and per-share provisions and the measurement price of each outstanding SAR, (v) the number of shares subject to and the repurchase price per share subject to each outstanding Restricted Stock Award and (vi) the share and per-share-related provisions and the purchase price, if any, of each outstanding Other Stock-Based Award, shall be equitably adjusted by the Company (or substituted Awards may be made, if applicable) in the manner determined by the Board. Without limiting the generality of the foregoing, in the event the Company effects a split of the Common Stock by means of a stock dividend and the exercise price of and the number of shares subject to an outstanding Option are adjusted as of the date of the distribution of the dividend (rather than as of the record date for such dividend), then an optionee who exercises an Option between the record date and the distribution date for such stock dividend shall be entitled to receive, on the distribution date, the stock dividend with respect to the shares of Common Stock acquired upon such Option exercise, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend.

(b) Reorganization Events.

(1) Definition. A "***Reorganization Event***" shall mean: (a) any merger or consolidation of the Company with or into another entity as a result of which all of the Common Stock of the Company is converted into or exchanged for the right to receive cash, securities or other property or is cancelled, (b) any transfer or disposition of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange or other transaction or (c) any liquidation or dissolution of the Company.

(2) Consequences of a Reorganization Event on Awards Other than Restricted Stock.

(A) In connection with a Reorganization Event, the Board may take any one or more of the following actions as to all or any (or any portion of) outstanding Awards other than Restricted Stock on such terms as the Board determines (except to the extent specifically provided otherwise in an applicable Award agreement or another agreement between the Company and the Participant): (i) provide that such Awards shall be assumed, or substantially equivalent Awards shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof), (ii) upon written notice to a Participant, provide that all of the Participant's unexercised Awards will terminate immediately prior to the consummation of such Reorganization Event unless exercised by the Participant (to the extent then exercisable) within a specified period following the date of such notice, (iii) provide that outstanding Awards shall become exercisable, realizable, or deliverable, or restrictions applicable to an Award shall lapse, in whole or in part prior to or upon such Reorganization Event, (iv) in the event of a Reorganization Event under the terms of which holders of Common Stock will receive upon consummation thereof a cash payment for each share surrendered in the Reorganization Event (the "***Acquisition Price***"), make or provide for a cash payment to Participants with respect to each Award held by a Participant equal to (A) the number of shares of Common Stock subject to the vested portion of the Award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such Reorganization Event) multiplied by (B) the excess, if any, of (I) the Acquisition Price over (II) the exercise, measurement or purchase price of such Award and any applicable tax withholdings, in exchange for the termination of such Award, (v) provide that, in connection with a liquidation or dissolution of the Company, Awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise, measurement or purchase price thereof and any applicable tax withholdings) and (vi) any combination of the foregoing. In taking any of the actions permitted under this Section 9(b)(2), the Board shall not be obligated by the Plan to treat all Awards, all Awards held by a Participant, or all Awards of the same type, identically.

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(B) Notwithstanding the terms of Section 9(b)(2)(A), in the case of outstanding Restricted Stock Units that are subject to Section 409A of the Code: (i) if the applicable Restricted Stock Unit agreement provides that the Restricted Stock Units shall be settled upon a "change in control event" within the meaning of Treasury Regulation Section 1.409A-3(i)(5)(i), and the Reorganization Event constitutes such a "change in control event", then no assumption or substitution shall be permitted pursuant to Section 9(b)(2)(A)(i) and the Restricted Stock Units shall instead be settled in accordance with the terms of the applicable Restricted Stock Unit agreement; and (ii) the Board may only undertake the actions set forth in clauses (iii), (iv) or (v) of Section 9(b)(2)(A) if the Reorganization Event constitutes a "change in control event" as defined under Treasury Regulation Section 1.409A-3(i)(5)(i) and such action is permitted or required by Section 409A of the Code; if the Reorganization Event is not a "change in control event" as so defined or such action is not permitted or required by Section 409A of the Code, and the acquiring or succeeding corporation does not assume or substitute the Restricted Stock Units pursuant to clause (i) of Section 9(b)(2)(A), then the unvested Restricted Stock Units shall terminate immediately prior to the consummation of the Reorganization Event without any payment in exchange therefor.

(C) For purposes of Section 9(b)(2)(A)(i), an Award (other than Restricted Stock) shall be considered assumed if, following consummation of the Reorganization Event, such Award confers the right to purchase or receive pursuant to the terms of such Award, for each share of Common Stock subject to the Award immediately prior to the consummation of the Reorganization Event, the consideration (whether cash, securities or other property) received as a result of the Reorganization Event by holders of Common Stock for each share of Common Stock held immediately prior to the consummation of the Reorganization Event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); *provided, however*, that if the consideration received as a result of the Reorganization Event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise or settlement of the Award to consist solely of such number of shares of common stock of the acquiring or succeeding corporation (or an affiliate thereof) that the Board determined to be equivalent in value (as of the date of such determination or another date specified by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Reorganization Event.

(3) Consequences of a Reorganization Event on Restricted Stock. Upon the occurrence of a Reorganization Event other than a liquidation or dissolution of the Company, the repurchase and other rights of the Company with respect to outstanding Restricted Stock shall inure to the benefit of the Company's successor and shall, unless the Board determines otherwise, apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to such Restricted Stock; *provided*, *however*, that the Board may provide for termination or deemed satisfaction of such repurchase or other rights under the instrument evidencing any Restricted Stock or any other agreement between a Participant and the Company, either initially or by amendment. Upon the occurrence of a Reorganization Event involving the liquidation or dissolution of the Company, except to the extent specifically provided to the contrary in the instrument evidencing any Restricted Stock or any other agreement between a Participant and the Company, all restrictions and conditions on all Restricted Stock then outstanding shall automatically be deemed terminated or satisfied.

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10. General Provisions Applicable to Awards

(a) Transferability of Awards. Awards shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an Incentive Stock Option, pursuant to a qualified domestic relations order, and, during the life of the Participant, shall be exercisable only by the Participant; *provided, however*, that the Board may permit or provide in an Award for the gratuitous transfer of the Award by the Participant to or for the benefit of any immediate family member, family trust or other entity established for the benefit of the Participant and/or an immediate family member thereof if the Company would be eligible to use a Form S-8 under the Securities Act for the registration of the sale of the Common Stock subject to such Award to such proposed transferee; *provided further*, that the Company shall not be required to recognize any such permitted transfer until such time as such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument in form and substance satisfactory to the Company confirming that such transferee shall be bound by all of the terms and conditions of the Award. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees. For the avoidance of doubt, nothing contained in this Section 10(a) shall be deemed to restrict a transfer to the Company.

(b) Documentation. Each Award shall be evidenced in such form (written, electronic or otherwise) as the Board shall determine. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) Board Discretion. Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award need not be identical, and the Board need not treat Participants uniformly.

(d) Termination of Status. The Board shall determine the effect on an Award of the disability, death, termination or other cessation of employment, authorized leave of absence or other change in the employment or other status of a Participant and the extent to which, and the period during which, the Participant, or the Participant's legal representative, conservator, guardian or Designated Beneficiary, may exercise rights under the Award.

(e) Withholding. The Participant must satisfy all applicable federal, state, and local or other income and employment tax withholding obligations before the Company will deliver stock certificates or otherwise recognize ownership of Common Stock under an Award. The Company may decide to satisfy the withholding obligations through additional withholding on salary or wages. If the Company elects not to or cannot withhold from other compensation, the Participant must pay the Company the full amount, if any, required for withholding or have a broker tender to the Company cash equal to the withholding obligations. Payment of withholding obligations is due before the Company will issue any shares on exercise, vesting or release from forfeiture of an Award or at the same time as payment of the exercise or purchase price, unless the Company determines otherwise. If provided for in an Award or approved by the Board in its sole discretion, a Participant may satisfy such tax obligations in whole or in part by delivery (either by actual delivery or attestation) of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value; *provided, however*, except as otherwise provided by the Board, that the total tax withholding where stock is being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income). Shares used to satisfy tax withholding requirements cannot be subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements.

(f) Amendment of Award. Except as otherwise provided in Sections 5(g) and 6(e) with respect to repricings and Section 11(d) with respect to actions requiring stockholder approval, the Board may

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amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or realization, and converting an Incentive Stock Option to a Nonstatutory Stock Option. The Participant's consent to such action shall be required unless (i) the Board determines that the action, taking into account any related action, does not materially and adversely affect the Participant's rights under the Plan or (ii) the change is permitted under Section 9.

(g) Conditions on Delivery of Stock. The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously issued or delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and regulations and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Company may consider appropriate to satisfy the requirements of any applicable laws, rules or regulations.

(h) Acceleration. The Board may at any time provide that any Award shall become immediately exercisable in whole or in part, free of some or all restrictions or conditions, or otherwise realizable in whole or in part, as the case may be.

11. Miscellaneous

(a) No Right To Employment or Other Status. No person shall have any claim or right to be granted an Award by virtue of the adoption of the Plan, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan, except as expressly provided in the applicable Award.

(b) No Rights As Stockholder. Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be distributed with respect to an Award until becoming the record holder of such shares.

(c) Effective Date and Term of Plan. The Plan shall become effective immediately prior to the effectiveness of the Company's initial public offering (the "***Effective Date***"). No Awards shall be granted under the Plan after the expiration of 10 years from the Effective Date, but Awards previously granted may extend beyond that date.

(d) Amendment of Plan. The Board may amend, suspend or terminate the Plan or any portion thereof at any time provided that (i) to the extent required by Section 162(m) of the Code, no Award granted to a Participant that is intended to comply with Section 162(m) of the Code after the date of such amendment shall become exercisable, realizable or vested, as applicable to such Award, unless and until the Company's stockholders approve such amendment in the manner required by Section 162(m) of the Code; and (ii) no amendment that would require stockholder approval under the rules of NASDAQ may be made effective unless and until the Company's stockholders approve such amendment;. In addition, if at any time the approval of the Company's stockholders is required as to any other modification or amendment under Section 422 of the Code or any successor provision with respect to Incentive Stock Options, the Board may not effect such modification or amendment without such approval. Unless otherwise specified in the amendment, any amendment to the Plan adopted in accordance with this Section 11(d) shall apply to, and be binding on the holders of, all Awards outstanding under the Plan at the time the amendment is adopted, provided the Board determines that such amendment, taking into account any related action, does not materially and adversely affect the rights of Participants under the Plan. No Award shall be made that is conditioned upon stockholder

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approval of any amendment to the Plan unless the Award provides that (i) it will terminate or be forfeited if stockholder approval of such amendment is not obtained within no more than 12 months from the date of grant and (2) it may not be exercised or settled (or otherwise result in the issuance of Common Stock) prior to such stockholder approval.

(e) Authorization of Sub-Plans (including for Grants to non-U.S. Employees). The Board may from time to time establish one or more sub-plans under the Plan for purposes of satisfying applicable securities, tax or other laws of various jurisdictions. The Board shall establish such sub-plans by adopting supplements to the Plan containing (i) such limitations on the Board's discretion under the Plan as the Board deems necessary or desirable or (ii) such additional terms and conditions not otherwise inconsistent with the Plan as the Board shall deem necessary or desirable. All supplements adopted by the Board shall be deemed to be part of the Plan, but each supplement shall apply only to Participants within the affected jurisdiction and the Company shall not be required to provide copies of any supplement to Participants in any jurisdiction which is not the subject of such supplement.

(f) Compliance with Section 409A of the Code. Except as provided in individual Award agreements initially or by amendment, if and to the extent (i) any portion of any payment, compensation or other benefit provided to a Participant pursuant to the Plan in connection with his or her employment termination constitutes "nonqualified deferred compensation" within the meaning of Section 409A of the Code and (ii) the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i) of the Code, in each case as determined by the Company in accordance with its procedures, by which determinations the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six months plus one day after the date of "separation from service" (as determined under Section 409A of the Code) (the "***New Payment Date***"), except as Section 409A of the Code may then permit. The aggregate of any payments that otherwise would have been paid to the Participant during the period between the date of separation from service and the New Payment Date shall be paid to the Participant in a lump sum on such New Payment Date, and any remaining payments will be paid on their original schedule.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under the Plan are determined to constitute nonqualified deferred compensation subject to Section 409A of the Code but do not to satisfy the conditions of that section.

(g) Limitations on Liability. Notwithstanding any other provisions of the Plan, no individual acting as a director, officer, employee or agent of the Company will be liable to any Participant, former Participant, spouse, beneficiary, or any other person for any claim, loss, liability, or expense incurred in connection with the Plan, nor will such individual be personally liable with respect to the Plan because of any contract or other instrument he or she executes in his or her capacity as a director, officer, employee or agent of the Company. The Company will indemnify and hold harmless each director, officer, employee or agent of the Company to whom any duty or power relating to the administration or interpretation of the Plan has been or will be delegated, against any cost or expense (including attorneys' fees) or liability (including any sum paid in settlement of a claim with the Board's approval) arising out of any act or omission to act concerning the Plan unless arising out of such person's own fraud or bad faith.

(h) Governing Law. The provisions of the Plan and all Awards made hereunder shall be governed by and interpreted in accordance with the laws of the State of Delaware, excluding choice-of-law principles of the law of such state that would require the application of the laws of a jurisdiction other than the State of Delaware.