

IDERA PHARMACEUTICALS, INC.  
Form DEF 14A  
April 25, 2019

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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

Filed by a Party other than the Registrant

Check the appropriate box:

- Preliminary Proxy Statement
- Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))**
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Material under §240.14a-12

**IDERA PHARMACEUTICALS, INC.**

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(Name of Registrant as Specified In Its Charter)

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

Payment of Filing Fee (Check the appropriate box):

- No fee required.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.
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(1) Amount Previously Paid:

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(3) Filing Party:

(4) Date Filed:

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**IDERA PHARMACEUTICALS, INC.**

505 Eagleview Blvd., Suite 212  
Exton, PA 19341

**NOTICE OF 2019 ANNUAL MEETING OF STOCKHOLDERS**

**Date and Time:** Tuesday, June 4, 2019 at 8:30 a.m., local time

**Place:** Idera Pharmaceuticals, Inc.  
505 Eagleview Boulevard  
Suite 212  
Exton, Pennsylvania 19341

**Items of Business:**

Elect two Class III directors to our board of directors for terms to expire at the 2022 annual meeting of stockholders;

Approve, by non-binding vote, executive compensation;

Approve an amendment to our 2013 Stock Incentive Plan to increase the number of shares authorized for issuance thereunder;

Approve an amendment to our 2017 Employee Stock Purchase Plan to increase the number of shares authorized for issuance thereunder;

Ratify the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2019; and

Transact any other business as may properly come before the 2019 annual meeting or any postponement or adjournment of the 2019 annual meeting.

The board of directors has no knowledge of any other business to be transacted at the 2019 annual meeting.

**Record Date:** You may vote at the 2019 annual meeting if you were a stockholder of record at the close of business on April 18, 2019.

**Proxy Voting:** It is important that your shares be represented and voted at the 2019 annual meeting. Whether or not you plan to attend the 2019 annual meeting, please mark, sign, date and promptly mail your proxy card in the enclosed postage-paid envelope or follow the instructions on the proxy card to vote by telephone or over the internet. You may revoke your proxy at any time before its exercise at the 2019 annual meeting.

By order of the board of directors,

/s/ BRYANT D. LIM

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Bryant D. Lim  
*Senior Vice President, General Counsel  
and Corporate Secretary*

Exton, Pennsylvania

April 25, 2019

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**IDERA PHARMACEUTICALS, INC.**

505 Eagleview Blvd., Suite 212  
Exton, PA 19341

**PROXY STATEMENT**

**For our Annual Meeting of Stockholders to be held on June 4, 2019**

Idera Pharmaceuticals, Inc., a Delaware corporation, which is referred to as "we," "us," the "Company" or "Idera" in this proxy statement, is sending you this proxy statement and the enclosed proxy card because our board of directors is soliciting your proxy to vote at our 2019 annual meeting of stockholders, or the 2019 annual meeting. The 2019 annual meeting will be held on Tuesday, June 4, 2019, at 8:30 a.m., local time, at our office located at 505 Eagleview Boulevard, Suite 212, Exton, Pennsylvania 19341. If the 2019 annual meeting is adjourned for any reason, then proxies submitted may be used at any adjournment of the 2019 annual meeting.

This proxy statement summarizes information about the proposals to be considered at the 2019 annual meeting and other information you may find useful in determining how to vote. The proxy card is one means by which you may authorize another person to vote your shares in accordance with your instructions.

We are mailing this proxy statement and the enclosed proxy card to stockholders on or about April 25, 2019.

In this mailing, we are also including copies of our annual report to stockholders for the year ended December 31, 2018, or 2018 Annual Report. Our 2018 Annual Report consists of our annual report on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission, or the SEC, on March 6, 2019, including our audited financial statements, which annual report on Form 10-K is available free of charge on our website, [www.iderapharma.com](http://www.iderapharma.com), where it can be accessed by clicking "Investors" and then "SEC Filings," or through the SEC's electronic data system at [www.sec.gov](http://www.sec.gov). **To obtain directions to be able to attend the 2019 annual meeting and vote in person, write to Investor Relations, Idera Pharmaceuticals, Inc., 505 Eagleview Blvd., Suite 212, Exton, PA 19341, call our toll-free number (877) 888-6550, or email Investor Relations at [ir@iderapharma.com](mailto:ir@iderapharma.com).**

**Important Notice Regarding the Availability of  
Proxy Materials for the 2019 Annual Meeting  
to Be Held on June 4, 2019:**

**The Notice of Annual Meeting, Proxy Statement and 2018 Annual Report are available at  
[<http://ir.iderapharma.com/shareholder-services/annual-meeting>.]**

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**INFORMATION ABOUT THE 2019 ANNUAL MEETING**

**Who may vote?**

Holders of record of our common stock at the close of business on April 18, 2019, the record date for the 2019 annual meeting, are entitled to vote on each matter properly brought before the 2019 annual meeting. Holders of our common stock will be entitled to one vote for each share of common stock held as of the record date. As of the close of business on April 18, 2019, the record date for the 2019 annual meeting, we had 28,021,756 shares of common stock outstanding.

**How do I vote my shares if I am a stockholder of record?**

If you are a stockholder of record (meaning that you hold shares in your name in the records of our transfer agent, Computershare Trust Company, N.A., and that your shares are not held in "street name" by a bank or brokerage firm), you may vote your shares in any one of the following ways:

*You may vote by mail.* To vote by mail, you need to complete, date and sign the proxy card that accompanies this proxy statement and promptly mail it in the enclosed postage-prepaid envelope. You do not need to put a stamp on the enclosed envelope if you mail it from within the United States.

*You may vote by telephone.* To vote by telephone through services provided by Computershare Trust Company, N.A., call 1-800-652-VOTE (8683), and follow the instructions provided on the proxy card that accompanies this proxy statement. If you vote by telephone, you do not need to complete and mail your proxy card.

*You may vote over the internet.* To vote over the internet through services provided by Computershare Trust Company, N.A., please go to the following website: <http://www.investorvote.com/IDRA> and follow the instructions at that site for submitting your proxy. If you vote over the internet, you do not need to complete and mail your proxy card.

*You may vote in person.* If you attend the 2019 annual meeting, you may vote by delivering your completed proxy card in person or you may vote by completing a ballot at the 2019 annual meeting. Ballots will be available at the 2019 annual meeting.

Your proxy will only be valid if you complete and return the proxy card, vote by telephone or vote over the internet at or before the 2019 annual meeting. The persons named in the proxy card will vote the shares you own in accordance with your instructions on your proxy card, in your vote by telephone or in your vote over the internet. If you return the proxy card, vote by telephone or vote over the internet, but do not give any instructions on a particular matter described in this proxy statement, the persons named in the proxy card will vote the shares you own in accordance with the recommendations of our board of directors.

**How do I vote my shares if I hold them in "street name"?**

If the shares you own are held in "street name" by a bank or brokerage firm, your bank or brokerage firm, as the record holder of your shares, is required to vote your shares according to your instructions. In order to vote your shares, you will need to follow the directions that your bank or brokerage firm provides to you. Many banks and brokerage firms solicit voting instructions over the internet or by telephone.

Under applicable stock exchange rules, banks or brokerage firms subject to these rules that hold shares in street name for customers have the discretion to vote those shares with respect to certain matters if they have not received instructions from the beneficial owners. Banks or brokerage firms will have this discretionary authority with respect to routine or "discretionary" matters. Among the proposals to be presented at the 2019 annual meeting, Proposal Five (the ratification of the selection of



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our independent registered public accounting firm) is a discretionary matter, and banks and brokerage firms are permitted to vote your shares even if you have not given voting instructions. Proposal One (the election of directors), Proposal Two (the approval of a non-binding vote on executive compensation), Proposal Three (the approval of an amendment to our 2013 Stock Incentive Plan to increase the number of shares authorized for issuance thereunder) and Proposal Four (approval of an amendment to our 2017 Employee Stock Purchase Plan to increase the number of shares authorized for issuance thereunder) are non-routine or "non-discretionary" matters, and banks and brokerage firms cannot vote your shares on such proposals if you have not given voting instructions. "Broker non-votes" occur when a bank or brokerage firm submits a proxy for shares but does not indicate a vote for a particular proposal because the bank or brokerage firm either does not have authority to vote on that proposal and has not received voting instructions from the beneficial owner, or has discretionary authority but chooses not to exercise it. The effect of broker non-votes is discussed below in the answer to the question "What vote is required to approve each matter and how will votes be counted?".

Even if your shares are held in street name, you are welcome to attend the 2019 annual meeting. If your shares are held in street name, you may not vote your shares in person at the 2019 annual meeting unless you obtain a proxy, executed in your favor, from the holder of record (i.e., your bank or brokerage firm). If you hold your shares in street name and wish to vote in person, please contact your bank or brokerage firm before the 2019 annual meeting to obtain the necessary proxy from the holder of record.

**How may I change or revoke my vote?**

If you are a stockholder of record, even if you complete and return a proxy card or vote by telephone or over the internet, you may change or revoke your vote at any time before your proxy is exercised by taking one of the following actions:

send written notice to our Secretary, Bryant Lim, at our address above, stating that you wish to revoke your vote;

deliver to us another signed proxy card with a later date or vote by telephone or over the internet at a later date; or

attend the 2019 annual meeting, notify our Secretary that you are present and then vote by ballot.

If you own shares in street name, your bank or brokerage firm should provide you with instructions for changing or revoking your vote.

**What constitutes a quorum?**

In order for business to be conducted at the 2019 annual meeting, a quorum must be present. A quorum consists of the holders of a majority of the shares of our common stock issued, outstanding and entitled to vote at the 2019 annual meeting.

Shares of common stock present in person or represented by proxy (including broker non-votes and shares that are abstained or withheld or with respect to which no voting instructions are provided for one or more of the matters to be voted upon) will be counted for the purpose of determining whether a quorum exists.

If a quorum is not present, the 2019 annual meeting will be adjourned until a quorum is obtained.

Table of Contents**What vote is required to approve each matter and how will votes be counted?**

The table below sets forth the vote required for each matter being submitted to our stockholders at the 2019 annual meeting to be approved and the effect that abstentions, withheld votes and broker

| <b>Proposal</b>  | <b>Affirmative Vote Required</b>   | <b>Abstentions/Withholds</b> | <b>Broker Non-Votes</b> |
|--|--|------------------------------|-------------------------|
| Election of Directors<br><i>(Proposal One)</i>                                       | Plurality of votes cast by holders of common stock entitled to vote      | No effect(1)                 | No effect               |
| Advisory Vote on Executive Compensation<br><i>(Proposal Two)</i>                     | Majority of common stock present or represented and voting on the matter | No effect                    | No effect               |
| Approval of Amendment to 2013 Stock Incentive Plan<br><i>(Proposal Three)</i>        | Majority of common stock present or represented and voting on the matter | No effect                    | No effect               |
| Approval of Amendment to 2017 Employee Stock Purchase Plan<br><i>(Proposal Four)</i> | Majority of common stock present or represented and voting on the matter | No effect                    | No effect               |
| Ratification of Selection of Ernst & Young LLP<br><i>(Proposal Five)</i>             | Majority of common stock present or represented and voting on the matter | No effect                    | N/A                     |

- (1) You may vote FOR all of the director nominees, WITHHOLD your vote from all of the director nominees or WITHHOLD your vote from any of the director nominees.

Each share of common stock will be counted as one vote.

**How does the board of directors recommend that I vote?**

Our board of directors recommends that you vote as follows:

To elect the three nominees to our board of directors (Proposal One); and

FOR Proposal Two, Proposal Three, Proposal Four and Proposal Five.

Under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and related SEC regulations, the vote on executive compensation, as described in greater detail in Proposal Two, set forth elsewhere in this proxy statement, is an advisory vote, meaning it is non-binding. The vote on the ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm, as described in greater detail in Proposal Five, is also advisory. Our board will carefully consider the outcome of each of these votes.

**Will any other business be conducted at the 2019 annual meeting of stockholders?**

Our board of directors does not know of any other business to be conducted or matters to be voted upon at the 2019 annual meeting. If any other matter properly comes before the 2019 annual meeting, the persons named in the proxy card that accompanies this proxy statement will exercise their judgment in deciding how to vote or otherwise act with respect to that matter at the 2019 annual meeting.

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**Who is making and paying for the solicitation of proxies and how is it made?**

We are making the solicitation and will bear the costs of soliciting proxies. In addition to solicitations by mail, our directors, officers and employees, without additional remuneration, may solicit proxies by telephone, facsimile, email, personal interviews and other means. We may engage a proxy solicitor to distribute our proxy materials and solicit proxies, and if we were to do so would pay a fee for such services and reimburse the solicitor for reasonable disbursements. We have requested that brokerage houses, custodians, nominees and fiduciaries forward copies of the proxy materials to the persons for whom they hold shares and request instructions for voting the proxies. We will reimburse the brokerage houses and other persons for their reasonable out-of-pocket expenses in connection with this distribution.

**How and when may I submit a proposal for the 2020 annual meeting of stockholders?**

If you are interested in submitting a proposal for inclusion in the proxy statement and proxy card for our 2020 annual meeting of stockholders, or the 2020 annual meeting, you need to follow the procedures outlined in Rule 14a-8 of the Exchange Act. We must receive your proposal intended for inclusion in the proxy statement at our principal executive offices, 505 Eagleview Blvd., Suite 212, Exton, Pennsylvania 19341, Attention: Secretary, no later than December 27, 2019. SEC rules set standards for the types of stockholder proposals and the information that must be provided by the stockholder making the request.

If you wish to present a proposal at the 2020 annual meeting, but do not wish to have the proposal considered for inclusion in the proxy statement and proxy card or have not complied with the requirements for inclusion of such proposal in our proxy statement under SEC rules, you must also give written notice to us at the address noted above. Our bylaws specify the information that must be included in any such notice, including a brief description of the business to be brought before the annual meeting, the name of the stockholder proposing such business and stock ownership information for such stockholder. In accordance with our bylaws, we must receive this notice at least 60 days, but not more than 90 days, prior to the date of the 2020 annual meeting and the notice must include specified information regarding the proposal and the stockholder making the proposal.

Notwithstanding the foregoing, if we provide less than 70 days' notice or prior public disclosure of the date of the annual meeting to the stockholders, notice by the stockholders must be received by our Secretary no later than the close of business on the tenth day following the date on which the notice of the annual meeting was mailed or such public disclosure was made, whichever occurs first. If a stockholder who wished to present a proposal fails to notify us by this date, the proxies that management solicits for that meeting will have discretionary authority to vote on the stockholder's proposal if it is otherwise properly brought before that meeting. If a stockholder makes timely notification, the proxies may still exercise discretionary authority to vote on stockholder proposals under circumstances consistent with the SEC's rules.

**Are annual meeting materials householded?**

Some banks and brokerage firms may be participating in the practice of "householding" proxy statements and annual reports. This means that the banks and brokerage firms send only one copy of this proxy statement and the accompanying 2018 Annual Report to multiple stockholders in the same household. Upon request, we will promptly deliver separate copies of this proxy statement and our annual report to stockholders. To make such a request, please call Investor Relations at (877) 888-6550, write to Investor Relations, 505 Eagleview Blvd., Suite 212, Exton, Pennsylvania 19341 or email Investor Relations at [ir@iderapharma.com](mailto:ir@iderapharma.com). To receive separate copies of our annual report to stockholders and proxy statement in the future, or to receive only one copy for the household, please contact us or your bank or brokerage firm.

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**PROPOSAL ONE**

**ELECTION OF DIRECTORS**

**General Information**

Our board of directors is divided into three classes and currently consists of three Class I directors: Vincent J. Milano, Cristina Csimma, PharmD, MHP, and Michael R. Dougherty; three Class II directors: Howard Pien, James A. Geraghty and Maxine Gowen, Ph.D.; and two Class III directors: Mark Goldberg, M.D. and Carol A. Schafer. Each member of a class is elected for a three-year term, with the terms staggered so that approximately one-third of our directors stand for election at each annual meeting of stockholders. The Class I, Class II and Class III directors were elected to serve until the annual meeting of stockholders to be held in 2020, 2021 and 2019, respectively, and until their respective successors are elected and qualified.

Our board of directors, on the recommendation of the members of our nominating and corporate governance committee, has nominated Dr. Goldberg and Ms. Schafer for election as Class III directors at the 2019 annual meeting. At the 2019 annual meeting, stockholders will be asked to consider the election of Dr. Goldberg and Ms. Schafer. Ms. Schafer has been nominated for election as a director at a meeting of our stockholders for the first time. In December 2019, Ms. Schafer was elected to our board of directors as a Class III director by action of our board of directors with a term expiring at our 2019 annual meeting. Ms. Schafer was recommended for initial election to our board of directors by our nominating and corporate governance committee.

The persons named in the enclosed proxy card will vote to elect Dr. Goldberg and Ms. Schafer to our board of directors unless you indicate that you withhold authority to vote for the election of any or all nominees. You may not vote for more than two directors. Each Class III director will be elected to hold office until our 2022 annual meeting of stockholders and until his or her successor is elected and qualified or until his or her earlier resignation, death or removal. Each of the nominees is presently a director and each has indicated a willingness to serve as a director, if elected. If a nominee becomes unable or unwilling to serve, however, the persons acting under the proxy may vote for substitute nominees selected by the board of directors.

**Information about our Directors**

Set forth below is information about each member of our board of directors, including (a) the year in which each director first became a director, (b) their age as of March 31, 2019, (c) their positions and offices with our Company, (d) their principal occupations and business experience during at least the past five years and (e) the names of other public companies for which they currently serve, or have served within the past five years, as a director. We have also included information about each director's specific experience, qualifications, attributes or skills that led our board of directors to conclude that such individual should serve as one of our directors. We also believe that all of our directors have a reputation for integrity, honesty and adherence to high ethical standards. They each have demonstrated business acumen and an ability to exercise sound judgment, as well as a commitment of service to our Company and our board of directors.

**Recommendation of the Board of Directors**

**Our board of directors unanimously recommends that the stockholders vote FOR the election of Dr. Goldberg and Ms. Schafer as Class III directors.**

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**Class III Directors Terms to Expire in 2019**

**Mark Goldberg, M.D.**

*Director since 2014*

Dr. Goldberg, age 64, has served as a member of the board of directors, compensation committee and governance and nomination committee of ImmunoGen, Inc. since November 2011, a member of the board of directors, governance and nomination committee and compensation committee of GlycoMimetics, Inc. since July 2014, a member of the board of directors, audit committee and scientific committee of Idera Pharmaceuticals, Inc. since March 2014, and a member of the board of directors and compensation committee of Audentes Therapeutics, Inc. since December 2017, and from April 2015 until December 2017 was a member of the board of directors of aTyr Pharma. Dr. Goldberg served as a member of the board of directors of Synageva Biopharma Corp., or Synageva, from October 2008 until November 2011, when he stepped down to become a member of the executive management team at Synageva. Dr. Goldberg served as a member of the executive management team at Synageva until late 2014, rising to executive vice president, medical and regulatory strategy. In late 2014, Dr. Goldberg stepped down from the executive management team at Synageva and continued to be employed part-time, contributing to medical and regulatory strategy until leaving Synageva in June 2015 upon its acquisition by Alexion Pharmaceuticals, Inc. Prior to joining Synageva, Dr. Goldberg served in various management capacities of increasing responsibility at Genzyme from November 1996 to July 2011, including most recently as senior vice president, clinical development and global therapeutic head, oncology, genetic health, and as chairman of Genzyme's early product development board. Prior to joining Genzyme, Dr. Goldberg was a full-time staff physician at Brigham and Women's Hospital and the Dana-Farber Cancer Institute, where he still holds appointments. Dr. Goldberg is a part-time Associate Professor of Medicine at Harvard Medical School. From 2010 to 2017, Dr. Goldberg served as on the board of directors of the New England Division of the American Cancer Society. Since December 2017 he has chaired the eastern New England Board of the American Cancer Society and since January 2019 has been a member of the national board of directors of the American Cancer Society. Dr. Goldberg received an A.B. in biochemistry and molecular biology from Harvard University and an M.D. from Harvard Medical School. We believe Dr. Goldberg is qualified to serve on our board of directors due to his extensive healthcare and regulatory experience. We believe that Dr. Goldberg's qualifications to sit on our board of directors include his extensive scientific and medical background, public company board experience and extensive experience in the management and operations of pharmaceutical companies.

**Carol A. Schafer**

*Director since 2018*

Ms. Schafer, age 55, has more than 25 years of experience in investment banking, equity capital markets, corporate finance and business development in the biopharmaceutical sector, with substantial experience financing and facilitating investor access for public and private healthcare companies. Ms. Schafer most recently served as Vice Chair, Equity Capital Markets at Wells Fargo Securities. Prior to Wells Fargo, Ms. Schafer served as Vice President of Finance and Business Development at Lexicon Pharmaceuticals. Earlier in her career, Ms. Schafer was a Managing Director and Equity Capital Markets Sector Head at J.P. Morgan. Ms. Schafer received a B.A. from Boston College and an M.B.A from New York University. We believe that Ms. Schafer's qualifications to sit on our board of directors include her extensive financial background and her many years of experience providing investment banking, equity capital markets and strategic support to companies within the healthcare sector.

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**Class I Directors Terms to Expire in 2020**

**Vincent J. Milano**

*Director since 2014*

Vincent Milano, age 55, has been our President and Chief Executive Officer, and a member of our board of directors, since December 2014. Prior to joining us, Mr. Milano served as Chairman, President and Chief Executive Officer of ViroPharma Inc., a pharmaceutical company that was acquired by Shire Plc in January 2014, from March 2008 to January 2014, as its Vice President, Chief Financial Officer and Chief Operating Officer from January 2006 to March 2008 and as its Vice President, Chief Financial Officer and Treasurer from April 1996 to December 2005. Mr. Milano also served on the board of directors of ViroPharma from March 2008 to January 2014. Prior to joining ViroPharma, Mr. Milano served in increasingly senior roles, most recently senior manager, at KPMG LLP, an independent registered public accounting firm, from July 1985 to March 1996. Mr. Milano currently serves on the board of directors of Spark Therapeutics, Inc. and Vanda Pharmaceuticals Inc., each a publicly traded company, and VenatoRx Pharmaceuticals, Inc. Mr. Milano holds a Bachelor of Science degree in Accounting from Rider College. We believe Mr. Milano's qualifications to sit on our board of directors include his knowledge of our company as our President and Chief Executive Officer, knowledge of our industry, including over 20 years of experience serving in a variety of roles of increasing responsibility in the finance department, corporate administration and operations of a multinational biopharmaceutical company, and understanding of pharmaceutical research and development, sales and marketing, strategy, and operations in both the United States and overseas. He also has corporate governance experience through service on other public company boards.

**Cristina Csimma, PharmD, MHP**

*Director since 2019*

Dr. Csimma, age 60, currently serves as an independent director and Chair of the Nominating and Corporate Governance Committee of Neuralstem Inc. (CUR) and is a Board Director of T1D Exchange (non-profit-Type 1 Diabetes). She also serves on advisory boards including the Muscular Dystrophy Association Venture Philanthropy Scientific Advisory Committee; the Executive Oversight Board to the National Institutes of Health (NIH) NeuroNext Network, the Harvard and Brigham and Women's Hospital MRCT Center External Advisory Board, and the TREAT-NMD Advisory Committee for Therapeutics (TACT). Dr. Csimma previously served as a Director on the boards of Juniper Pharma (acquired by Catalent in 2018), Vtesse Pharma (acquired by Sucampo in 2017), was the Executive Chair of Exonics Therapeutics, and was President, founding CEO and Board Director of Cydan Inc. She also served on the NIH Blueprint Neurotherapeutics Network External Oversight Committee, was Vice President of Drug Development at Virdante Pharmaceuticals Inc. (acquired by Momenta), Principal at Clarus Ventures LLC (now Blackstone Life Science) and held roles of increasing responsibility in Clinical Development and Translational Research at Wyeth (now Pfizer), Genetics Institute and Dana Farber Cancer Institute. Dr. Csimma holds both a Doctor of Pharmacy and a Bachelor of Science in Pharmacy from the Massachusetts College of Pharmacy and Allied Health Sciences, as well as a Master of Health Professions from Northeastern University. We believe that Dr. Csimma's qualifications to sit on our board of directors include her significant public company management and board experience and knowledge of our industry.

**Michael R. Dougherty**

*Director since 2019*

Mr. Dougherty, age 61, was Executive Chairman of Celator Pharmaceuticals, Inc., a biopharmaceutical company, from August 2015 until its acquisition by Jazz Pharmaceuticals in July 2016; he also served as a director of Celator from July 2013 to July 2016. Mr. Dougherty previously served in a variety of senior positions, including chief executive officer of Kalidex Pharmaceuticals, Inc.,

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chief executive officer of Adolor Corporation, chief operating officer of Genomics Collaborative, Inc., chief executive officer of Genaera Corporation, and chief financial officer at Centocor, Inc. He currently serves on the board of directors of Marinus Pharmaceuticals, Inc. and Trevena, Inc., both publicly traded life sciences organizations. Mr. Dougherty also served on the board of directors of Foundation Medicine, Inc., Aviragen Therapeutics, Inc., Cemptra, Inc., and ViroPharma Incorporated. Mr. Dougherty received a B.S. in Accounting from Villanova University. We believe that Mr. Dougherty's qualifications to sit on our board of directors include his significant public company management and board experience and knowledge of our industry.

**Class II Nominees Terms to Expire in 2021**

**James A. Geraghty**

*Director since 2013*

Mr. Geraghty, age 64, has served as chairman of our board of directors since July 2013. Mr. Geraghty is an industry leader with over 35 years of strategic and leadership experience, including more than 25 years as a senior member of executive teams at biotechnology companies developing and commercializing innovative therapies. From May 2013 to October 2016, Mr. Geraghty was an Entrepreneur in Residence at Third Rock Ventures, a leading biotech venture fund. From April 2011 to December 2012, he served as a Senior Vice President of Sanofi, a global healthcare company. Prior to that, he served in various senior management roles at Genzyme Corporation, a biotechnology company, from 1992 to April 2011, including as Senior Vice President, International Development and President of Genzyme Europe. Mr. Geraghty currently serves as chairman of the board of Orchard Therapeutics and of Pieris Pharmaceuticals, and as a member of the board of Voyager Therapeutics and of Fulcrum Therapeutics, a private company. We believe that Mr. Geraghty's qualifications to sit on our board of directors include his public company board and management experience and his broad and deep knowledge of the industry in which we operate.

**Maxine Gowen, Ph.D.**

*Director since 2016*

Dr. Gowen, age 61, served as the founding CEO and President of Trevena, Inc., a biopharmaceutical company, from November 2007 until her retirement in 2018, and remains a member of its board of directors. Prior to joining Trevena, Dr. Gowen was Senior Vice President for the Center of Excellence for External Drug Discovery at GlaxoSmithKline plc, or GSK, where she held a variety of leadership positions during her tenure of 15 years. Before GSK, Dr. Gowen was Senior Lecturer and Head, Bone Cell Biology Group, Department of Bone and Joint Medicine, of the University of Bath, U.K. Dr. Gowen has served as a director of Akebia Therapeutics, Inc., a publicly traded company, since July 2014. From 2008 until 2012, Dr. Gowen served as a director of Human Genome Sciences, Inc., a publicly traded company. She received her Ph.D. from the University of Sheffield, U.K., an M.B.A. with academic honors from The Wharton School of the University of Pennsylvania, and a B.Sc. with Honors in Biochemistry from the University of Bristol, U.K. We believe that Dr. Gowen's qualifications to sit on our board of directors include her significant public company management and board experience and knowledge of our industry.

**Howard Pien**

*Director since 2018*

Mr. Pien, age 61, has worked in the pharmaceutical and biotechnology industries for over 30 years. He was Non-Executive Chairman of Juno Therapeutics, a development stage company focused on immunotherapy aimed to cure cancer, until its acquisition by Celgene in 2018. He was also previously a director of Vanda, a commercial-stage public company specializing in CNS (three years as Chairman), ImmunoGen, a public biotechnology company, and an advisor to the Life Sciences Practice of Warburg

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Pincus. From 2007 to 2009, Mr. Pien was the Chairman and CEO of Medarex, Inc., a public biotechnology company, until it was acquired by Bristol-Myers Squibb. From 2003 to 2006, he was the Chairman and CEO of Chiron, a public biotechnology company, which was acquired by Novartis. Mr. Pien's previous Board directorships include Talon, Arresto, Ikaria, Sage, Immunogen and ViroPharma, Incorporated (where he was lead independent director) all biopharmaceutical companies that were acquired in strategic transactions. Between 1991 and 2003, he held various executive positions at GlaxoSmithKline plc (GSK) and SmithKline Beecham, as Presidents of US, International, and Pharmaceuticals. Prior to GSK, Mr. Pien worked for Abbott Labs for six years and Merck & Co., Inc. for five years. Mr. Pien holds a BS in engineering from MIT and an MBA from Carnegie-Mellon University. We believe that Mr. Pien's qualifications to sit on our board of directors include Mr. Pien's extensive experience as a chief executive officer in the pharmaceutical industry, including an immuno-oncology company, and his expertise in corporate governance matters.

**Director Compensation**

We use a combination of cash and equity-based compensation to attract and retain candidates to serve on our board of directors. We do not compensate directors who are also our employees for their service on our board of directors. As a result, Mr. Milano does not receive any compensation for his service on our board of directors.

We generally review our director compensation program every two years with the advice of an independent compensation consultant. In January 2018, we modified our director compensation program, effective January 1, 2018, to include annual cash compensation for directors serving as members of the Scientific Advisory Committee. In September 2018, we modified our director compensation program, effective September 18, 2018, to revise the number of shares issued and awarded upon initial election and on an annual basis. In November 2018, we modified our director compensation program, effective January 1, 2019, to increase the cash compensation for service on the board of directors from \$35,000 to \$40,000.

Under our director compensation program, we pay our non-employee directors retainers in cash. Each director receives a cash retainer for service on the board of directors and for service on each committee on which the director is a member. The chairmen of each committee receive higher retainers for such service. These fees are paid quarterly in arrears. 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 was a member during 2018 were as follows:

|   | <b>Member<br/>Annual Fee</b> | <b>Chairman<br/>Annual Fee</b> |
|---|------------------------------|--------------------------------|
| Board of Directors                            | \$ 35,000                    | \$ 70,000                      |
| Audit Committee                               | \$ 7,500                     | \$ 15,000                      |
| Compensation Committee                        | \$ 6,250                     | \$ 12,500                      |
| Nominating and Corporate Governance Committee | \$ 4,000                     | \$ 8,000                       |
| Scientific Advisory Committee                 | \$ 4,000                     | \$ 4,000                       |

Our director compensation program includes a stock-for-fees policy, under which directors have the right to elect to receive common stock in lieu of cash fees. These shares of common stock are issued under our 2013 Stock Incentive Plan. The number of shares issued to participating directors is determined on a quarterly basis by dividing the cash fees to be paid through the issuance of common stock by the fair market value of our common stock, which is the closing price of our common stock, on the first business day of the quarter following the quarter in which the fees are earned. In 2018, several of our directors elected to receive shares of our common stock in lieu of cash fees as set forth in the footnotes to the Director Compensation table below.



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Under our director compensation program, we also reimburse our directors for travel and other related expenses for attendance at meetings.

Under our current director compensation program, upon their initial election to the board of directors, new non-employee directors receive an initial option grant to purchase 23,000 shares of our common stock, and all non-employee directors, other than the chairman, receive an annual option grant to purchase 11,500 shares of our common stock. The chairman receives an annual option grant for 14,500 shares of our common stock. The annual grants are made on the date of our annual meeting of stockholders and fully vest one year from that date of grant. The initial options granted to our non-employee directors vest with respect to one third of the underlying shares on the first anniversary of the date of grant and the balance of the underlying shares vest in eight equal quarterly installments following the first anniversary of the date of grant, subject to continued service as a director, and are granted under our 2013 Stock Incentive Plan. These options are granted with exercise prices equal to the fair market value of our common stock, which is the closing price of our common stock, on the date of grant and will become immediately exercisable in full if there is a change in control of our company.

Under our retirement policy for non-employee members of the board, if a non-employee director is deemed to retire, then:

all outstanding options held by such director will automatically vest in full; and

the period during which such director may exercise the options will be extended to the expiration of the option under the plan.

Under the policy, a non-employee director will be deemed to have retired if:

the director resigns from the board or determines not to stand for re-election or is not nominated for re-election at a meeting of our stockholders and has served as a director for more than 10 years; or

the director does not stand for re-election or is not nominated for re-election due to the fact that he or she is or will be older than 75 at the end of such director's term.

The following table sets forth a summary of the compensation we paid to our non-employee directors who served on our board in 2018.

### DIRECTOR COMPENSATION FOR 2018

| Name                | Fees Earned or<br>Paid in Cash<br>(\$) | Option Awards<br>(\$)(1) | All Other<br>Compensation<br>(\$) | Total<br>(\$) |
|---------------------|--|--------------------------|-----------------------------------|---------------|
| Julian C. Baker(2)  | 25,014(3)                              | 53,955                   |                                   | 78,969        |
| James A. Geraghty   | 85,500(4)                              | 67,983                   |                                   | 153,483       |
| Mark Goldberg       | 46,500                                 | 53,955                   |                                   | 100,455       |
| Maxine Gowen        | 47,033                                 | 53,955                   |                                   | 100,988       |
| Kelvin M. Neu       | 51,500(5)                              | 53,955                   |                                   | 105,455       |
| Howard Pien(6)      | 11,770(7)                              | 130,365                  |                                   | 142,135       |
| William S. Reardon  | 54,000                                 | 53,955                   |                                   | 107,955       |
| Carol A. Schafer(8) | 1,617                                  | 50,246                   |                                   | 52,043        |

(1) These amounts represent the aggregate grant date fair value of option awards made to each listed director in 2017 as computed in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718, "Stock Compensation," or ASC 718. These amounts do not represent the actual amounts paid to or realized by the directors during 2018. See Note 11

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to the financial statements included in our annual report on Form 10-K for the year ended December 31, 2018 regarding assumptions we made in determining the fair value of option awards. As of December 31, 2018, our non-employee directors, or former director in the case of Mr. Baker, held options to purchase shares of our common stock as follows: Mr. Baker: 34,375; Mr. Geraghty: 96,686; Dr. Goldberg: 34,375; Dr. Gowen: 25,625; Dr. Neu: 34,375; Mr. Pien: 23,000; Mr. Reardon: 40,625; and Ms. Schafer: 23,000.

- (2) Mr. Baker resigned from our board of directors on September 18, 2018.
- (3) Includes cash meeting fees of \$25,014 in lieu of which Mr. Baker elected to receive 12,892 shares of our common stock.
- (4) Includes cash meeting fees of \$10,688 in lieu of which Mr. Geraghty elected to receive 8,096 shares of our common stock.
- (5) Includes cash meeting fees of \$51,500 in lieu of which Dr. Neu elected to receive 22,838 shares of our common stock.
- (6) Mr. Pien was appointed to our board of directors on September 18, 2018.
- (7) Includes cash meeting fees of \$10,313 in lieu of which Mr. Pien elected to receive 2,929 shares of our common stock.
- (8) Ms. Schafer was appointed to our board of directors on December 18, 2018.

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**CORPORATE GOVERNANCE INFORMATION**

**Board of Directors**

Our board of directors is responsible for establishing our broad corporate policies and overseeing the management of our company. Our chief executive officer and our other executive officers are responsible for our day-to-day operations. Our board evaluates our corporate performance and approves, among other things, our corporate strategies and objectives, operating plans, major commitments of corporate resources and significant policies. Our board also evaluates and appoints our executive officers.

Our board of directors met nine times during 2018, including regular, special and telephonic meetings. Each director who served as a director during 2018 attended at least 75% of the total number of board meetings held during 2018 while he or she was a director and of the total number of meetings held by all board committees on which he or she served during 2018.

Directors are responsible for attending our annual meetings of stockholders. Seven of our directors attended the 2018 annual meeting of stockholders in person.

**Board Leadership Structure**

Our board of directors does not have a policy on whether the offices of chairman of the board of directors and chief executive officer should be separate and, if they are to be separate, whether the chairman of the board of directors should be selected from among the independent directors or should be an employee of our company. Our board of directors believes that it should have the flexibility to make these determinations at any given point in time in the way that it believes best to provide appropriate leadership for our company at that time. Currently, Mr. Geraghty serves as chairman of our board of directors and Mr. Milano serves as chief executive officer. Our board of directors believes that this separation allows our chief executive officer to focus on our day-to-day business, while allowing the chairman of the board of directors to lead the board of directors in its fundamental role of providing advice to and independent oversight of management.

Our board of directors recognizes that no single leadership model is right for all companies and at all times and that depending on the circumstances, other leadership models, such as a combined chairman and chief executive officer, might be appropriate. Accordingly, the board of directors periodically reviews its leadership structure. Pursuant to our corporate governance guidelines, if the chairman is not an independent director, the board of directors may elect a lead director from its independent directors. In such case, the chairman and chief executive officer would consult periodically with the lead director on board of directors matters and on issues facing our company. In addition, the lead director would serve as the principal liaison between the chairman of the board of directors and the independent directors and would preside at any executive session of independent directors.

**Board of Directors' Role in Risk Oversight**

Our board of directors, as a whole, has responsibility for risk oversight, with reviews of certain areas being conducted by relevant committees that report directly to the board of directors. The oversight responsibility of the board of directors and its committees is enabled by management reporting processes that are designed to provide visibility to the board of directors about the identification, assessment and management of critical risks and management's risk mitigation strategies. These areas of focus include competitive, economic, operational, financial (accounting, credit, liquidity and tax), legal, regulatory, compliance, health, safety, environmental, political and reputational risks. Our board of directors regularly reviews information regarding our strategy, operations, credit and liquidity, as well as the risks associated with each. Our compensation committee is responsible for overseeing risks relating to our executive compensation plans and arrangements. Our audit committee

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is responsible for overseeing financial risks and risks associated with related party transactions. Our nominating and corporate governance committee is responsible for overseeing risks associated with the independence of the board of directors. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, our entire board of directors is regularly informed through committee reports about such risks.

**Board Committees**

Our board of directors has established three standing committees: audit, compensation and nominating and corporate governance. Each of our audit, compensation and nominating and corporate governance committees operates under a charter that has been approved by our board of directors. Our board of directors has also adopted corporate governance guidelines to assist our board of directors in the exercise of its duties and responsibilities. Current copies of the charters for the audit, compensation and nominating and corporate governance committees and the corporate governance guidelines are posted on our website, [www.iderapharma.com](http://www.iderapharma.com), and can be accessed by clicking "Investors" and "Corporate Governance."

*Audit Committee*

Our board of directors has established a standing committee. Our audit committee operates under a charter that has been approved by our board of directors. A current copy of the charter for the audit committee is posted on our website, [www.iderapharma.com](http://www.iderapharma.com), and can be accessed by clicking "Investors" and "Corporate Governance."

Our audit committee's responsibilities include:

appointing, approving the compensation of, and assessing the independence of our independent registered public accounting firm;

overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of certain reports from such accounting firm;

reviewing and discussing with management and our independent registered public accounting firm our annual and quarterly financial statements and related disclosures;

monitoring our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;

discussing our risk management policies;

establishing procedures for the receipt and retention of accounting related complaints and concerns;

reviewing and approving related party transactions;

meeting independently with our independent registered public accounting firm and management; and

preparing the audit committee report required by SEC rules.

The current members of our audit committee are Ms. Schaefer (Chair), Mr. Geraghty and Dr. Goldberg. Our board of directors has determined that Ms. Schaefer is an "audit committee financial expert" within the meaning of SEC rules and regulations. Each member of the audit committee is independent as defined under applicable rules of the Nasdaq Stock Market, including the independence requirements contemplated

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by Rule 10A-3 under the Exchange Act. During 2018, our audit committee held seven meetings in person or by teleconference.

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*Compensation Committee*

Our compensation committee's responsibilities include:

- annually reviewing and approving corporate goals and objectives relevant to compensation for our executive officers;
- determining the compensation of our senior executives;
- overseeing the evaluation of our senior executives;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to the board of directors with respect to director compensation;
- reviewing and discussing annually with management the compensation discussion and analysis required by the SEC rules and included in this proxy statement; and
- preparing the compensation committee report required by SEC rules.

The current members of our compensation committee are Dr. Gowen (Chair) and Mr. Pien. During 2018, the compensation committee held five meetings in person or by teleconference.

The processes and procedures followed by our compensation committee in considering and determining executive compensation are described below under the heading "Executive Compensation."

*Nominating and Corporate Governance Committee*

Our nominating and corporate governance committee's responsibilities include:

- identifying individuals qualified to become members of our board of directors;
- recommending to our board of directors the persons to be nominated for election as directors or to fill vacancies on our board of directors, and the persons to be appointed to each of the committees of the board of directors;
- reviewing and making recommendations to the board of directors with respect to management succession planning;
- developing and recommending to the board of directors corporate governance principles; and
- overseeing periodic evaluations of the board of directors.

The current member of our nominating and corporate governance committee is Mr. Geraghty (Chairman). During 2018, the nominating and corporate governance committee held two meetings in person or by teleconference.

The processes and procedures followed by our nominating and corporate governance committee in identifying and evaluating director candidates are described below under the heading "Director Nomination Process."

**Director Independence**

Under applicable rules of the Nasdaq Stock Market, a director will only qualify as an "independent director" if, in the opinion of our board of directors, that person does not have a relationship which would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. Our board of directors has determined that Mr. Geraghty, Dr. Goldberg, Dr. Gowen, Dr. Neu, Mr. Pien, Ms. Schafer and all of the members of each of the audit, compensation and nominating and corporate governance committees are independent as defined under applicable

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rules of the Nasdaq Stock Market including, in the case of all members of the audit committee, the independence requirements contemplated by Rule 10A-3 under the Exchange Act and, in the case of all members of the compensation committee, the independence requirements contemplated by Rule 10C-1 under the Exchange Act.

Our board of directors had previously made a similar determination of independence with respect to Mr. Baker and Mr. Reardon, who served as directors until September 2018 and March 2019, respectively.

**Director Nomination Process**

The process followed by our nominating and corporate governance committee to identify and evaluate director candidates includes requests to members of our board of directors and others for recommendations, meetings from time to time to evaluate biographical information and background material relating to potential candidates and interviews of selected candidates by members of our nominating and corporate governance committee and our board of directors. The nominating and corporate governance committee has from time to time used a third-party recruiting firm to identify and interview potential candidates.

In considering whether to recommend any particular candidate for inclusion in the board of director's slate of recommended director nominees, the nominating and corporate governance committee will apply the criteria set forth in our corporate governance guidelines. These criteria include the candidate's:

business acumen;

knowledge of our business and industry;

age;

experience;

diligence;

conflicts of interest;

ability to act in the interests of all stockholders; and

in the case of the renomination of existing directors, performance on our board of directors and on any committee of which the director was a member.

Our corporate governance guidelines also provide that candidates should not be discriminated against on the basis of race, religion, national origin, sex, sexual orientation, disability or any other basis proscribed by law and that our nominating and corporate governance committee should consider the value of diversity of the board of directors when evaluating particular candidates. The committee has not adopted any formal or informal diversity policy and treats diversity as one of the criteria to be considered by the committee. The committee does not assign specific weights to particular criteria that the committee reviews and no particular criterion is a prerequisite for the consideration of any prospective nominee. We believe that the backgrounds and qualifications of our directors, considered as a group, should provide a composite and diverse mix of experience, knowledge and abilities that will allow the board of directors to fulfill its responsibilities.

**Stockholder Nominees**

Stockholders may recommend individuals to the nominating and corporate governance committee for consideration as potential director candidates by submitting the individuals' name, together with appropriate biographical information and background materials and a statement as



to whether the

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stockholder or group of stockholders making the recommendation has beneficially owned more than 5% of our common stock for at least one year as of the date such recommendation is made, to Nominating and Corporate Governance Committee, c/o Secretary, Idera Pharmaceuticals, Inc., 505 Eagleview Blvd., Suite 212, Exton, PA 19341. Assuming that appropriate biographical and background material has been provided on a timely basis, the nominating and corporate governance committee will evaluate stockholder-recommended candidates by following substantially the same process, and applying substantially the same criteria, as it follows for candidates submitted by others. If the board of directors determines to nominate a stockholder-recommended candidate and recommends his or her election, then his or her name will be included in our proxy card for the next annual meeting.

Stockholders also have the right under our bylaws to nominate director candidates directly, without any action or recommendation on the part of the nominating and corporate governance committee or the board of directors, by following the procedures set forth in our bylaws, including advance notice requirements. Candidates nominated by stockholders in accordance with the procedures set forth in our bylaws will not be included in our proxy card for the next annual meeting. See "Information about the 2019 annual meeting How and when may I submit a proposal for the 2020 annual meeting of stockholders?" for more information about these procedures.

**Communicating with our Board of Directors**

Our board of directors will give appropriate attention to written communications that are submitted by stockholders and will respond if and as appropriate. The chairman of the board of directors (if an independent director) or the lead independent director, if any, is primarily responsible for monitoring communications from stockholders and for providing copies or summaries to the other directors, as he or she considers appropriate.

Communications are forwarded to all directors if they relate to important substantive matters and include suggestions or comments that the chairman of the board of directors or lead independent director, as the case may be, considers to be important for the directors to know. In general, communications relating to corporate governance and long-term corporate strategy are more likely to be forwarded than communications relating to ordinary business affairs, personal grievances and matters that involve repetitive or duplicative communications.

Stockholders who wish to send communications on any topic to the board of directors should address such communications to Board of Directors, c/o Secretary, Idera Pharmaceuticals, Inc., 505 Eagleview Blvd., Suite 212, Exton, PA 19341.

Each communication from a stockholder should include the following information in order to permit stockholder status to be confirmed and to provide an address to forward a response if deemed appropriate:

the name, mailing address and telephone number of the stockholder sending the communication;

the number of shares held by the stockholder; and

if the stockholder is not a record owner of our securities, the name of the record owner of our securities beneficially owned by the stockholder.

**Code of Business Conduct and Ethics**

We have adopted a written code of business conduct and ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. We have posted a current copy of the Code of Business Conduct and Ethics in the "Investors Corporate Governance" section of our website, which is located at [www.iderapharma.com](http://www.iderapharma.com). We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K.

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regarding an amendment to, or waiver from, a provision of our code of business conduct and ethics by posting such information on our website at [www.iderapharma.com](http://www.iderapharma.com).

**Compensation Committee Interlocks and Insider Participation**

Our compensation committee currently consists of Dr. Gowen and Mr. Pien. Dr. Gowen, Mr. Pien and Dr. Neu each served as members of our compensation committee for all or a portion of 2018. No member of our compensation committee was at any time during 2018, or was formerly, an officer or employee of ours. No member of our compensation committee engaged in any related person transaction involving our company during 2018. None of our executive officers has served as a director or member of the compensation committee (or other committee serving the same function as the compensation committee) of any other entity, while an executive officer of that other entity served as a director or member of our compensation committee.

Table of Contents**EXECUTIVE OFFICERS**

Our executive officers and their respective ages and positions as of March 31, 2019 are described below. Our executive officers serve until they resign or the board of directors terminates their position.

| <b>Name</b>                | <b>Age</b> | <b>Position</b>   |
|----------------------------|------------|---|
| Vincent J. Milano*         | 55         | President and Chief Executive Officer                                 |
| R. Clayton Fletcher        | 56         | Senior Vice President, Business Development and Strategy              |
| Joanna Horobin, M.B., Ch.B | 64         | Senior Vice President, Chief Medical Officer                          |
| John J. Kirby              | 47         | Vice President of Finance, Principal Financial and Accounting Officer |
| Bryant D. Lim              | 48         | Senior Vice President, General Counsel and Corporate Secretary        |
| Jonathan Yingling, Ph.D.   | 50         | Senior Vice President, Chief Scientific Officer                       |

\*

Mr. Milano is a member of our board of directors. See "Information about our Directors" above for more information about Mr. Milano.

**R. Clayton Fletcher** has been our Senior Vice President, Business Development and Strategic Planning since January 2015. Prior to joining us, Mr. Fletcher served in increasingly senior positions at ViroPharma Incorporated, which was acquired by Shire Plc in January 2014, from April 2001 until January 2014, including as Vice President, Business Development and Project Management from 2005 until January 2014. Mr. Fletcher served as Senior Project Manager at SmithKline Beecham plc, a pharmaceutical company, which was purchased by Glaxo Wellcome plc in December 2000, from 1997 until 2001. Prior to working at SmithKline Beecham, he served as Project Scientist, at Becton, Dickinson and Company, a medical devices company and as Principal Scientist at Intracel Corporation, a biopharmaceutical company. Prior to working at Intracel, he served as Senior Associate Scientist at Centocor Biotech, Inc., a biotechnology company from 1991 until 1993. Mr. Fletcher holds a B.S. and a M.S. in biology from Wake Forest University.

**Joanna Horobin, M.B., Ch.B** has been our Senior Vice President and Chief Medical Officer since November 2015. Prior to joining us, Dr. Horobin served as the Chief Medical Officer of Verastem, Inc., a biopharmaceutical company, from October 2012 to June 2015. Prior to joining Verastem, she served as President of Syndax Pharmaceuticals, a biopharmaceutical company, from September 2006 to October 2012 and as Chief Executive Officer from September 2006 until April 2012. Prior to that, Dr. Horobin held several roles of increasing responsibility at global pharmaceutical corporations such as Rhône-Poulenc Rorer (now Sanofi) and Chugai-Rhône-Poulenc. Dr. Horobin received her medical degree from the University of Manchester, England.

**John J. Kirby** joined the Company in 2015 as the Company's Vice President of Corporate Accounting and has served as Vice President of Finance since July 2018 and as principal financial officer and principal accounting officer since October 2018. Prior to joining us, Mr. Kirby served as Assistant Controller at Endo Pharmaceuticals, Inc. from November 2014 to October 2015. From August 2012 to July 2014, Mr. Kirby served as Vice President, Chief Accounting Officer and Corporate Controller at ViroPharma Incorporated. Mr. Kirby began his career at KPMG, LLP in their Healthcare and Life Science Practice and served as a Regional Audit Director at AstraZeneca Pharmaceuticals L.P. prior to joining ViroPharma Incorporated. Mr. Kirby received his B.S. in Accountancy from Villanova University and is a licensed certified public accountant in the Commonwealth of Pennsylvania.

**Bryant D. Lim** has been our Senior Vice President, General Counsel and Secretary since September 2018. Prior to joining us, Mr. Lim served as Vice President, Assistant General Counsel, and prior to that, Chief Compliance Officer at Incyte Corporation from March 2014 to September 2018. Prior to Incyte, Mr. Lim held roles of increasing responsibility at ViroPharma Incorporated from January 2009 until March 2014. Mr. Lim served as Assistant Counsel at Merck & Co., Inc. and also

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was associated with Morgan, Lewis & Bockius, LLP. Mr. Lim began his legal career as a law clerk for a federal judge. Mr. Lim received his J.D. from Villanova University School of Law, where he currently serves on its adjunct faculty. Mr. Lim received his B.A. from the University of Rochester.

***Jonathan Yingling, Ph.D.*** joined our company as Senior Vice President, Early Development in February 2017 and since January 2018 has been serving as our Chief Scientific Officer. Prior to joining us, Dr. Yingling was Chief Scientific Officer at Bind Therapeutics Inc., a biotechnology company that filed for bankruptcy in May 2016, from December 2015 to August 2016. Prior to joining Bind Therapeutics, Dr. Yingling served as vice president, Oncology Discovery and Translational Research at Bristol-Myers Squibb Company, or BMS, a pharmaceutical company, from June 2013 to October 2015. During his tenure at BMS, he was responsible for the oncology research portfolio as well as translational capabilities in immuno-oncology. Dr. Yingling earned his Ph.D. in Cell and Molecular Biology and Pharmacology at Duke University and was a Howard Hughes Postdoctoral Fellow at Vanderbilt University.

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**SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT**

The following table sets forth, as of March 31, 2019, information we know about the beneficial ownership of our common stock by:

each person or entity, including any "group" as that term is used in Section 13(d)(3) of the Exchange Act, who is known by us to own beneficially more than 5% of the issued and outstanding shares of our common stock;

each of our current directors;

each of our named executive officers, as set forth in the Summary Compensation Table set forth in this proxy; and

all of our current directors and executive officers as a group.

We have determined beneficial ownership in accordance with the rules of the SEC, and the information in the table below is not necessarily indicative of beneficial ownership for any other purpose. The SEC has defined "beneficial" ownership of a security to mean the possession, directly or indirectly, of voting power and/or investment power. In computing the percentage ownership of each person, shares of common stock subject to options, warrants or rights held by that person that are currently exercisable, or exercisable within 60 days of March 31, 2019, are deemed to be outstanding and beneficially owned by that person. These shares, however, are not deemed outstanding for the purpose of computing the percentage ownership of any other person.

To our knowledge and except as indicated in the notes to this table and pursuant to applicable community property laws, each stockholder named in the table has sole voting and investment power with respect to the shares set forth opposite such stockholder's name. The percentage of ownership is

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based on 28,008,037 shares of our common stock issued and outstanding on March 31, 2019. All fractional common share amounts have been rounded to the nearest whole number.

| Name and Address of Beneficial Owner(1)   | Number of Shares<br>Beneficially Owned | Percentage of<br>Outstanding Shares |
|---|--|-------------------------------------|
| <b>5% Stockholders</b>  |  |                                     |
| Affiliates of Baker Brothers Advisors, LLC, 860 Washington Street, 3rd Floor, New York, NY 10014  | 4,895,415(2)                           | 17.44%                              |
| Pillar Investment Entities c/o Pillar Invest Offshore SAL, Starco Center, Bloc B, 3rd Flr, Omar Daouk St., Beirut, M8 2020-3313, Lebanon  | 2,481,777(3)                           | 8.85%                               |
| Castellina Ventures Ltd., 325 Waterfront Drive, Omar Hodge Building, 2nd Floor, Wickham's Cay, Road Town, Tortola, British Virgin Islands | 2,137,638(4)                           | 7.63%                               |
| Blackrock, Inc., 55 East 52 <sup>nd</sup> Street, New York, NY 10055  | 1,478,231(5)                           | 5.28%                               |
| <b>Named Executive Officers and Directors</b>   |  |                                     |
| Vincent J. Milano   | 380,814(6)                             | 1.34%                               |
| Louis J. Arcudi, III  | 198,645(7)                             | *                                   |
| R. Clayton Fletcher   | 117,341(8)                             | *                                   |
| Cristina Csimma   | (9)                                    |                                     |
| Michael R. Dougherty  | (9)                                    |                                     |
| James A. Geraghty   | 153,697(10)                            | *                                   |
| Mark Goldberg   | 37,760(11)                             | *                                   |
| Maxine Gowen  | 19,885(12)                             | *                                   |
| Joanna Horobin  | 91,648(13)                             | *                                   |
| John J. Kirby   | 41,553(14)                             | *                                   |
| Kelvin M. Neu   | 44,319(15)                             | *                                   |
| Howard Pien   | 2,929                                  | *                                   |
| William S. Reardon  | 44,746(16)                             | *                                   |
| Carol A. Schafer  | 5,000                                  | *                                   |
| Jonathan Yingling   | 52,731(17)                             | *                                   |
| All current directors and executive officers as a group (15 individuals)  | 997,166(18)                            | 3.46%                               |

\*

Denotes less than 1% beneficial owner.

(1)

Except as otherwise noted, the address for each person listed above is c/o Idera Pharmaceuticals, Inc., 505 Eagleview Boulevard, Suite 212, Exton, PA 19341.

(2)

Consists of (i) 496,758 shares of our common stock owned by 667, L.P., (ii) 4,258,065 shares of our common stock owned by Baker Brothers Life Sciences, L.P., (iii) 59,267 shares of our common stock owned by 14159, L.P., (iv) (a) 9,246 shares of our common stock held directly by Julian Baker and (b) 16,559 shares of our common stock held directly by Dr. Neu, and in which each of 667, L.P., Baker Brothers Life Sciences, L.P. and 14159, L.P., which we refer to collectively as the Funds, has an indirect pecuniary interest and may be deemed to own a portion of these shares, and (v) (a) 27,760 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019 held by Mr. Baker and (b) 27,760 shares of common stock subject to outstanding options that are exercisable within 60 days after March 31, 2019 held by Dr. Neu. As a result of the application of the Beneficial Ownership Cap, as described below in this footnote, the table above does not include the following as being beneficially owned by the Funds: (a) 298,741 shares of common stock issuable upon exercise of warrants to purchase common stock owned by 667, L.P., (b) 2,410,071 shares of common stock issuable upon exercise of warrants to

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purchase common stock owned by Baker Brothers Life Sciences, L.P. and (c) 60,070 shares of common stock issuable upon exercise of warrants to purchase common stock owned by 14159, L.P. The information in this footnote is based on a Schedule 13D/A filed with the SEC on September 20, 2018; Form 4s filed with the SEC on October 3, 2018 and January 4, 2019; and on information provided to us by the Funds, Julian Baker and Dr. Neu. Mr. Baker, a member of the our board until his resignation in September 2018, is a managing member of Baker Bros. Advisors LP and is a principal of Baker Bros. Advisors (GP), LLC, the sole general partner of Baker Bros. Advisors LP. Baker Bros. Advisors LP serves as the investment advisor to the Funds. Accordingly, Mr. Baker may be deemed to have sole power to direct the voting and disposition of the shares of common stock held directly by the Funds and indirectly by Baker Bros. Advisors LP and Baker Bros. Advisors (GP), LLC. Mr. Baker expressly disclaims beneficial ownership over shares held directly by the Funds and indirectly by Baker Bros. Advisors LP and Baker Bros. Advisors (GP), LLC, except to the extent of his pecuniary interest therein, if any, by virtue of his pecuniary interest therein. Dr. Neu, a member of the Idera board, is an employee of Baker Bros. Advisors LP. Under the terms of the warrants issued to the Funds, the Funds are not permitted to exercise such warrants to purchase common stock to the extent that such exercise would result in the Funds (and their affiliates) beneficially owning more than 4.99% of the number of shares of our common stock issued and outstanding immediately after giving effect to the issuance of shares of common stock issuable upon exercise of such warrants to purchase common stock. This limitation on exercise of the warrants to purchase common stock issued to the Funds is referred to in this footnote as the Beneficial Ownership Cap. The Funds have the right to increase this beneficial ownership limitation in their discretion on 61 days' prior written notice to us, provided that in no event are the Funds permitted to exercise such warrants to purchase common stock to the extent that such exercise would result in the Funds (and their affiliates) beneficially owning in the aggregate more than 19.99% of the number of shares of our common stock issued and outstanding or the combined voting power of our securities outstanding immediately after giving effect to the issuance of shares of common stock issuable upon exercise of such warrants to purchase common stock.

- (3) Consists of (i) 216,266 shares of common stock held by Pillar Pharmaceuticals I, L.P., or Pillar I, (ii) 673,985 shares of common stock held by Pillar Pharmaceuticals II, L.P., or Pillar II, (iii) 293,980 shares of common stock held by Pillar Pharmaceuticals III, L.P., or Pillar III, (iv) 25,000 shares of common stock held by Pillar Pharmaceuticals IV, L.P., or Pillar IV, (v) 109,375 shares of common stock held by Pillar V, (vi) 1,061,212 shares of common stock held by Participations Besancon, or Besancon, and over which Pillar Invest Corporation has investment discretion, pursuant to an advisory agreement between Pillar Invest Corporation and Besancon, or the Advisory Agreement, (vii) 67,584 shares of common stock held directly by Youssef El Zein and (viii) 34,375 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019 held by Mr. El Zein. Mr. El Zein, a member of our board until October 31, 2017, is a director and controlling stockholder of Pillar Invest Corporation, which is the general partner of Pillar I, Pillar II, Pillar III, Pillar IV and Pillar V and is a limited partner of Pillar I, Pillar II, Pillar III, Pillar IV and Pillar V. Mr. El Zein expressly disclaims beneficial ownership over shares held directly by Pillar I, Pillar II, Pillar III, Pillar IV, Pillar V and indirectly by Pillar Invest Corporation. Besancon is an investment fund having no affiliation with Mr. El Zein, Pillar I, Pillar II, Pillar III, Pillar IV, Pillar V or Pillar Invest Corporation. The information in this footnote is based on a Schedule 13D/A filed with the SEC on October 17, 2016; Form 4s filed with the SEC on October 17, 2017 and August 17, 2018; and on information provided to us by Pillar Invest Corporation and Mr. El Zein.
- (4) Based on Schedule 13G filed with the SEC on September 4, 2018 by Castellina Ventures Ltd. ("Castellina"). The Ballaison Trust ("Ballaison"), a trust established under the laws of New Zealand whose principal business address and principal office address is 14, rue de la Corratierie,



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PO Box 5209, CH-1211 Geneva 11, is the sole shareholder of Castellina and may be deemed a beneficial owner. Edward Martin-Du Pan and Yves Bruderlein are the trustees of Ballaison. The Ballaison Trust was established for the principal purpose of holding and preserving assets for the benefit of its beneficiaries. Castellina reported that it had sole voting power and sole dispositive power over all shares beneficially owned. The Schedule 13G does not identify any shares with respect to which there is a right to acquire beneficial ownership. The Schedule 13G states that the shares were acquired and are held in the ordinary course of business and were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of us.

- (5) Based on the Schedule 13G filed with the SEC on February 8, 2019 by BlackRock, Inc. and certain subsidiaries ("BlackRock"). BlackRock reported that it had sole voting power over 1,451,102 shares and sole dispositive power over all shares beneficially owned. The Schedule 13G does not identify any shares with respect to which there is a right to acquire beneficial ownership. The Schedule 13G states that the shares were acquired and are held in the ordinary course of business and were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of us.
- (6) Includes 324,998 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (7) Includes 192,251 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (8) Consists of 117,341 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (9) As of April 8, 2019, the effective date of the director's appointment to the Board.
- (10) Includes of 88,264 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (11) Includes of 27,760 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (12) Includes 19,010 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019, and 875 shares of common stock held in the name Brian Macdonald for Maxine Gowen Trust, for which Dr. Gowen is a beneficiary and trustee.
- (13) Includes 89,177 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (14) Consists of 37,849 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (15) Includes of 27,760 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.
- (16) Includes 40,625 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019. Mr. Reardon retired from the Board in March 2019.
- (17) Consists of 52,731 shares of common stock subject to outstanding stock options that are exercisable within 60 days after March 31, 2019.

- (18) Includes 825,515 shares of common stock subject to outstanding stock options held by the directors and executive officers as a group that are exercisable within 60 days after March 31, 2019.

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**EXECUTIVE COMPENSATION**

**Compensation Discussion and Analysis**

This Compensation Discussion and Analysis, or CD&A, should be read in conjunction with the compensation tables and narratives that immediately follow this section.

***Introduction***

This CD&A provides an overview and analysis of the philosophy, objectives, process, components and additional aspects of our 2018 executive compensation program. This analysis focuses on the compensation paid to our named executive officers, or NEOs:

Vincent J. Milano, President and Chief Executive Officer,

R. Clayton Fletcher, Senior Vice President of Business Development and Strategy

Joanna Horobin, Senior Vice President and Chief Medical Officer

John J. Kirby, Vice President of Finance, Principal Financial and Accounting Officer

Jonathan Yingling, Senior Vice President and Chief Scientific Officer

Louis J. Arcudi, III, Former Chief Financial Officer and Senior Vice President, Operations

***Compensation Philosophy and Objectives***

Our general executive compensation philosophy has been established by our compensation committee, which acts pursuant to authority delegated to it by our board. Our compensation committee is comprised solely of independent directors as defined by applicable rules and regulations of Nasdaq and the SEC. The compensation committee seeks to achieve the following broad goals in connection with our executive compensation program:

attract, retain and motivate the best possible executive talent;

ensure executive compensation is aligned with our corporate strategies and business objectives, including our short-term operating goals and longer-term strategic objectives;

promote the achievement of key strategic and financial performance measures by linking short- and long-term cash and equity incentives to the achievement of measurable corporate and individual performance goals; and

align executives' incentives with the creation of stockholder value.

To achieve these objectives, the compensation committee:

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sets short- and long-term compensation at levels the compensation committee believes are competitive with those of other companies in our industry and our region that compete with us for executive talent;

ties a substantial portion of each executive officer's overall cash compensation to key strategic, financial, research, and operational goals such as clinical trial and regulatory progress, intellectual property portfolio development, establishment and maintenance of key strategic relationships, and exploration of business development opportunities, as well as our financial and operational performance; and

provides a portion of our executive compensation in the form of stock options that vest over time from the date of grant of the option awards and from the time of achievement of performance milestones when applicable, which we believe helps to retain our executives and

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align their interests with those of our stockholders by allowing them to participate in the longer term success of our company as reflected in stock price appreciation.

***Advisory Vote on Executive Compensation***

We conducted an advisory vote on executive compensation, commonly referred to as a "say-on-pay" proposal, at our 2018 Annual Meeting of Stockholders. While this vote was not binding on us, we value the opinions of our stockholders and, to the extent there is any significant vote against the compensation of our named executive officers in the future, we will consider our stockholders' concerns and our board and compensation committee will evaluate whether any actions are necessary to address those concerns.

At our 2018 Annual Meeting of Stockholders, approximately 97% of the votes cast on the advisory vote on executive compensation approved the compensation paid to our named executive officers as disclosed in the proxy statement for that meeting. The board of directors and compensation committee considered the results of this advisory vote, together with the other factors and data, in determining executive compensation decisions and will continue to consider the outcome of our say-on-pay votes when making future compensation decisions for our named executive officers.

***Executive Compensation Process***

***Role of Our Compensation Committee and Our Chief Executive Officer***

In order to accomplish its objectives consistent with its philosophy for executive compensation and determine compensation for our named executive officers, our compensation committee reviews competitive information on executive compensation practices from peer companies as well as an assessment of overall corporate performance and individual performance. In connection therewith, our compensation committee typically takes the following actions annually:

reviews chief executive officer performance;

seeks input from our chief executive officer on the performance of all other executive officers;

reviews all components of executive officer compensation, including base salary, cash bonus targets and awards, equity compensation, the dollar value to the executive and cost to us of all health and life insurance and other employee benefits, and the estimated payout obligations under severance and change in control scenarios;

consults with its independent compensation consultant;

holds executive sessions (without our management present);

reviews information regarding the performance and executive compensation of other companies; and

reviews the outcomes from the foregoing with the board of directors.

Our chief executive officer does not submit an assessment of his own performance, does not present a recommendation on his own compensation, and does not participate in the portion of the meeting where his compensation is determined. Our compensation committee determines and recommends for final approval by the full Board, the compensation for our chief executive officer and other executive officers.

Under our annual performance review program for our executive officers, annual performance goals are determined for our company as a whole and for each executive officer individually.

**Annual corporate goals** are proposed by management and approved by the board of directors. These corporate goals target the achievement of specific research, clinical, operational, and

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financial milestones. The compensation committee determines how the components of our annual corporate goals will contribute to the overall performance evaluation.

**Annual individual goals** focus on contributions that facilitate the achievement of our corporate goals. Individual goals are proposed at the start of each year by each executive and approved by the chief executive officer and, as appropriate, the compensation committee. Typically, the compensation committee sets the chief executive officer's goals and reviews and discusses with the chief executive officer the goals for all other executive officers. The individual performance goals of each named executive officer consist primarily of the key objectives and goals from our annual business plan that relate to the functional area for which the executive officer is responsible. The individual performance goals for the chief executive officer are largely coextensive with the corporate goals.

At the end of each year, the compensation committee evaluates corporate and individual performance.

In assessing corporate performance, the compensation committee evaluates corporate performance alongside the approved corporate goals for the year and also evaluates other aspects of corporate performance, including achievements and progress made by us outside of the corporate goals.

In assessing individual performance, the compensation committee evaluates corporate performance in the areas of each officer's responsibility and relies on the chief executive officer's evaluation of each other officer. The chief executive officer prepares evaluations of the other executives and in doing so compares individual performance to the individual performance goals. The chief executive officer recommends annual executive salary increases, annual stock option awards and bonuses, if any, for the other executives, which are then reviewed and approved by the compensation committee. In the case of the chief executive officer, the compensation committee conducts his individual performance evaluation.

During this process, the compensation committee consults with its independent compensation consultant. To that end, in connection with the compensation committee's annual performance and compensation review in the fourth quarter of 2017, Pearl Meyer & Partners, LLC, or Pearl Meyer, provided the compensation committee with a blend of the data from the 2017 peer group (identified below) and compensation survey data from the Radford 2017 Global Life Sciences Survey, a survey of U.S. biotech companies. We refer to this blended data as the "2017 market compensation data."

For all executives, annual base salary increases, if any, are awarded during the first quarter following the end of the fiscal year. Annual stock option awards and bonuses, if any, are granted as determined by the compensation committee and are typically granted in the first quarter of the fiscal year. Beginning in 2019, the annual stock option awards will be given in two biannual tranches.

The compensation committee generally does not plan to approve annual equity grants to employees, including named executive officers, at a time when our company is in possession of material non-public information. We do not award stock options to named executive officers concurrently with the release of material non-public information.

*Role of the Compensation Committee's Independent Consultant*

In the fourth quarter of 2017, our compensation committee engaged Pearl Meyer in connection with our 2018 annual compensation assessment to review our executive compensation practices and to provide the compensation committee with an assessment of our compensation program against competitive market data. See "Use of Market Compensation Data" below for a discussion of the competitive market compensation data compiled by Pearl Meyer. Based on this assessment, Pearl Meyer made recommendations to our compensation committee regarding the amount and form of executive compensation, equity incentive programs, and compensation generally. Pearl Meyer did not

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provide any services to our company during 2017 or 2018 other than pursuant to their respective engagement by the compensation committee.

Our compensation committee analyzed whether the work of Pearl Meyer as a compensation consultant has raised any conflict of interest, taking into consideration the following factors: (a) the provision of other services to us by Pearl Meyer; (b) the amount of fees received from us by Pearl Meyer, as a percentage of the total revenue of Pearl Meyer; (c) Pearl Meyer's policies and procedures that are designed to prevent conflicts of interest; (d) any business or personal relationship of Pearl Meyer or the individual advisors employed by Pearl Meyer with a member of the compensation committee or any executive officer; and (e) any shares of our stock owned by Pearl Meyer or the individual advisors employed by Pearl Meyer. Our compensation committee determined, based on its analysis of the above factors, that the work of Pearl Meyer and the individual compensation advisors employed by Pearl Meyer as compensation consultants has not created any conflict of interest and the compensation committee is satisfied with the independence of Pearl Meyer. Going forward, the compensation committee intends to assess the independence of any of our compensation advisers by reference to the foregoing factors, consistent with applicable rules and regulations of Nasdaq and the SEC.

*Use of Market Compensation Data*

In making compensation decisions, our compensation committee reviewed competitive market compensation data compiled by Pearl Meyer. As part of its engagement, Pearl Meyer worked with the compensation committee in the fourth quarter of 2017 to select a peer group of publicly traded companies to be used in connection with our 2018 compensation decisions, including stock options granted during 2018, fiscal year 2018 salary adjustments and fiscal year 2018 target bonus percentages. In selecting this peer group, the compensation committee and Pearl Meyer generally targeted mid- to late-development stage companies in the Pharmaceuticals, Biotechnology and Life Sciences sectors that generally met the following screening criteria:

Company Size: revenue less than or equal to \$150M; operating expense less than or equal to four times our operating expense (i.e., less than or equal to \$240M); employees between 20-200;

Business Operations: conducting Phase 2 or Phase 3 clinical trials in at least one of oncology, rare diseases, or leveraging a 'technology platform' model; and

Other: exclude subsidiaries; companies with business challenges; companies having market valuations below \$50M; and companies that have recently conducted an initial public offering.

The following table lists the companies included in the 2017 peer group used in connection with our 2018 compensation decisions referred to above:

|                                  |                                  |                               |
|----------------------------------|----------------------------------|-------------------------------|
| Aduro BioTech, Inc.              | Endocyte, Inc.                   | Regulus Therapeutics, Inc.    |
| Advaxis, Inc.                    | Genocea Biosciences, Inc.        | Sangamo<br>Therapeutics, Inc. |
| Arrowhead Research Corp.         | GlycoMimetics, Inc.              | WAVE Life Sciences, Inc.      |
| Celldex Therapeutics, Inc.       | Immune Design Corp.              | Xencor, Inc.                  |
| Concert<br>Pharmaceuticals, Inc. | Immunomedics, Inc.               | ZIOPHARM<br>Oncology, Inc.    |
| Dicerna<br>Pharmaceuticals, Inc. | Inovio Pharmaceuticals, Inc.     |                               |
| Dynavax Technologies Corp.       | OncoMed<br>Pharmaceuticals, Inc. |                               |

The foregoing peer group companies were recommended by Pearl Meyer and approved by our compensation committee because they have similar business profiles to ours taking into account number of employees, market value and stage of development. Additionally, while there were no changes to the screening criteria used for determining the 2017 peer group used for 2018 compensation decisions, as compared to the determination of the 2016 peer group used for 2017 compensation



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decisions, certain companies were excluded from or added to the 2017 peer group, primarily due to application of our screening criteria (e.g. quantitative metrics and market capitalization).

Our compensation committee intends that if we achieve our corporate goals and the executive performs at the level expected, the executive should have the opportunity to receive compensation that is competitive with industry norms. Accordingly, our compensation committee generally targets overall compensation for executives towards the 50th percentile of the market data. However, the compensation committee does not apply those targets formulaically and allows for individuals to be positioned at different percentiles based on experience, performance levels and potential performance levels of the executive, and changes in duties and responsibilities.

*Components of Executive Compensation*

The primary elements of our executive compensation program are:

base salary;

annual cash bonuses;

stock option and restricted stock awards;

health insurance, life insurance, and other employee benefits; and

severance and change in control benefits.

The value of our variable, performance-based compensation is allocated between short-term compensation in the form of a cash bonus and long-term compensation in the form of stock option awards that vest over time from the date of grant of the option awards or from the time of achievement of performance milestones. The annual cash bonus is intended to provide an incentive to our executives to achieve short-term operational objectives. The stock option award is intended to provide an incentive for our executives to achieve longer-term strategic business goals, which should lead to higher stock prices and increased stockholder value. We have not had any formal or informal policy or target for allocating compensation between long-term and short-term compensation, between cash and non-cash compensation, or among the different forms of non-cash compensation. Instead, the compensation committee, after reviewing industry information and our cash resources, determines subjectively what it believes to be the appropriate level and mix of the various compensation components.

We do not have any defined benefit pension plans or any non-qualified deferred compensation plans.

We are party to employment agreements and employment offer letters with each of our named executive officers. Employment agreements and employment offer letters with our named executive officers are described below under the caption "Employment and Separation Agreements with our Named Executive Officers."

*Base Salary*

In establishing base salaries for our named executive officers, our compensation committee typically reviews the market compensation data presented by the committee's independent compensation consultant, considers historic salary levels of the executive officer and the nature of the executive officer's responsibilities, compares the executive officer's base salary with those of our other executives, and considers the executive officer's experience, performance and contributions. The compensation committee also typically considers the challenges involved in hiring and retaining executive talent in our industry and region. In assessing the executive officer's performance, the compensation committee considers the executive officer's role in the achievement of the annual corporate goals, as well as, in the case of our executive officers other than our chief executive officer, the performance evaluation prepared by our chief executive officer with respect to such executive officer. The compensation committee considers such evaluation as a means of informing the compensation committee's decision as to whether the executive officer's performance was generally consistent with our expectations.



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As part of our 2017 annual performance and compensation review, the compensation committee approved annual base salaries for our executive officers for 2018. In setting these annual base salaries, the compensation committee reviewed the 2017 market compensation data presented by Pearl Meyer. Similarly, as part of our December 2018 annual performance and compensation review, the compensation committee reviewed the 2018 market compensation data and approved new annual base salaries for our executive officers for 2019. In each of the 2017 and 2018 reviews, after considering each named executive officer's current salary, performance, and experience in the context of the market compensation data as well as relative to one another, the compensation committee approved the following salary increases and resulting base salaries:

| Executive     | 2017 Base Salary | 2018 Base Salary | % Increase | 2019 Base Salary | % Increase |
|---------------|------------------|------------------|------------|------------------|------------|
| Mr. Milano    | \$ 600,000       | \$ 600,000       | 0.0        | \$ 600,000       | 0.0        |
| Mr. Fletcher  | \$ 386,300       | \$ 400,000       | 3.5        | \$ 400,000       | 0.0        |
| Dr. Horobin   | \$ 410,000       | \$ 425,000       | 3.7        | \$ 425,000       | 0.0        |
| Mr. Kirby(1)  | \$ 231,750       | \$ 280,000       | 20.8       | \$ 280,000       | 0.0        |
| Dr. Yingling  | \$ 385,000       | \$ 400,000       | 3.9        | \$ 400,000       | 0.0        |
| Mr. Arcudi(2) | \$ 357,900       | \$ 370,000       | 3.4        |                  |            |

- (1) Mr. Kirby commenced employment with us in November 2015 and became the Company's principal financial officer and principal accounting officer effective October 31, 2018. In connection with Mr. Kirby's appointment as principal financial officer and principal accounting officer, Mr. Kirby's annual base salary was increased from \$239,850 to \$280,000.
- (2) Effective October 31, 2018, Mr. Arcudi, our former Chief Financial Officer and Senior Vice President, Operations, departed from us as a result of our consolidation to our Exton, PA headquarters.

*Annual Cash Performance Bonuses*

The compensation committee generally structures cash bonuses by linking them to the achievement of the annual corporate goals, corporate performance outside of the corporate goals (i.e. an unexpected opportunistic business development deal would be factored subjectively as an adjustment to the score that the committee derived from evaluation of the corporate goals), and individual performance. The amount of the bonus paid, if any, varies among the executive officers depending on individual performance and their contribution to the achievement of our annual corporate goals and corporate performance generally. The compensation committee reviews and assesses corporate goals and individual performance by executive officers and considers the reasons why specific goals have been achieved or have not been achieved. While achievement against the applicable corporate goals is given substantial weight in connection with the determination of annual bonuses, we also factor in an evaluation of our named executive officers' individual performance based on analysis of achievement of individual performance goals as well as the following subjective criteria:

leadership;

management;

judgment and decision-making skills;

results orientation; and

communication

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The compensation committee sets the individual bonus target percentages for each of our named executive officers. In determining the target bonus percentages to be used for 2018, the compensation committee concluded that the target bonus percentages should be competitive with the 50th percentile of the 2017 market compensation data and that there be no difference in the target bonus percentages of our named executive officers, other than for Mr. Milano. The following table sets forth the individual bonus target percentages for each of our named executive officers for 2018 and 2019.

| Executive    | Target Cash Bonus<br>(% of Base Salary) |      |
|--------------|---|------|
|              | 2018                                    | 2019 |
| Mr. Milano   | 50%                                     | 50%  |
| Mr. Fletcher | 40%                                     | 40%  |
| Dr. Horobin  | 40%                                     | 40%  |
| Mr. Kirby    | 30%                                     | 30%  |
| Mr. Lim      | 40%                                     | 40%  |
| Dr. Yingling | 40%                                     | 40%  |
| Mr. Arcudi   | 40%                                     |      |

Consistent with our company-wide annual incentive plan applicable to all employees, including our named executive officers, both a corporate performance score and individual performance score factored into the determination of each executive officer's cash bonus award for 2018.

Under the terms of our incentive plan, the corporate performance score is based on the degree to which corporate performance objectives have been achieved. This score is determined by the compensation committee and may range from 0-125%. The individual performance score is based on:

the degree to which individual performance objectives have been achieved;

the competencies and behaviors demonstrated in achieving results;

the technical skills required by the position; and

the completion of the ongoing responsibilities required by the position.

The individual performance score may range from 0-125% and is approved by the compensation committee. The individual's actual award is then calculated as follows:

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In setting corporate goals in the first quarter of 2018, the committee agreed to group the business objectives into one of three primary categories, each of which would contribute toward the overall assessment of our corporate performance. In assessing our corporate performance against our 2018

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corporate goals, and determining the corporate performance score, the compensation committee considered the extent to which the company achieved the business objectives in each of the categories, and assigned a score for each category, as summarized in the following table:

| Primary Goals   | Contribution toward Corporate Performance Score | 75% | Committee's Assessment of Performance (out of 100%) | 40% | Highlights of Performance on Key Objectives   |
|---|---|-----|---|-----|---|
| Advance Tilsotolimod (IMO-2125) program through Phase 3 and beyond PD-1 refractory melanoma |   |     |   |     | Initiated ILLUMINATE-301 study.<br><br>Progressed ILLUMINATE-204 and ILLUMINATE-301 enrollment.   |
| Advance 3GA program and IMO-8400 program to next decision point                             | 15%   |     | 10%   |     | Continued program expansion initiatives for beyond anti-PD1 refractory melanoma.<br><br>Timely analysis of both studies resulted in no-go decision for both 3GA and IMO-8400. |
| Enhance our ability to be successful through relevant foundational objectives               |   | 10% |   | 10% | Implemented an "at-the-market" equity program to facilitate future capital raising.<br><br>Reviewed strategic business development options.                                   |

Based on these achievements and resulting category scores, the compensation committee approved a corporate performance score of 60%. However, as a result of additional factors the compensation committee considered in determining the company score to be applied to executives, including proposed merger outcome and discovery outcomes during 2018, the compensation committee reduced the overall corporate performance score by 10% for the 2018 bonus calculation for executives and determined to use a corporate performance score of 50%, excluding Mr. Kirby due to the timing of his appointment.

In assessing each named executive officer's individual performance score, the compensation committee determined:

Mr. Milano's overall score would be equivalent to the corporate performance score of 50%;

Mr. Fletcher's individual performance score, recognizing his achievement against his personal objectives, including his role in business development along with his general leadership contributions, would be 115%, resulting in an overall bonus equal to 58% of his bonus target;

Dr. Horobin's individual performance score, recognizing her achievement against her personal objectives, including her role in achievements against our tilsotolimod (IMO-2125) clinical program goals along with her general leadership contributions, would be 85%, resulting in an overall bonus equal to 43% of her bonus target;

Mr. Kirby's individual performance score, recognizing his achievement against his personal objectives, including his role as principal financial and accounting officer, and general leadership contributions, would be 120%. Using the broader corporate score of 60%, as noted above, this resulted in an overall bonus equal to 86% of his bonus target; and

Dr. Yingling's individual performance score, recognizing his achievement against his personal objectives, including his role in advancing objective knowledge and understanding of our

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discovery platform, contributions to business development, and his general leadership contributions, would be 100%, resulting in an overall bonus equal to 50% of his bonus target.

Mr. Arcudi separated from the Company prior to the compensation committee's determinations and in connection with his severance agreement, received a prorated bonus for 2018 at 100% of target.

*Equity Compensation*

Our equity award program is the primary vehicle for offering long-term incentives to our executive officers, including our named executive officers. We believe that equity awards provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our named executive officers and our stockholders. Equity grants are intended as both a reward for contributing to the long-term success of our company and an incentive for future performance. The vesting feature of our equity awards is intended to further our goal of executive retention by providing an incentive to our named executive officers to remain in our employ during the vesting period. In determining the size of equity awards to our executives, our compensation committee considers:

the achievement of our annual corporate goals;

individual performance;

the applicable executive officer's previous awards, including the exercise price of such previous awards;

the recommendations of management;

the market compensation data presented by the committee's independent compensation consultant, and

the combined components of the executive officer's compensation.

The compensation committee approves all equity awards to our executive officers. Our equity awards have typically taken the form of stock options. However, under the terms of our stock incentive plans, we may grant equity awards other than stock options, such as restricted stock awards, stock appreciation rights, and restricted stock units. In January 2019, restricted stock units were granted to all employees, including our executive officers, as part of our annual incentive program.

The compensation committee typically makes initial stock option awards to named executive officers upon commencement of their employment and annual stock option awards thereafter. Stock option awards to our named executive officers after the initial stock option awards have typically been granted annually after the annual performance review. For 2018, this review occurred at the regularly scheduled meeting of the compensation committee held in the first quarter of 2018. Beginning in 2019, the annual stock option awards will be given in two biannual tranches. In general, annual stock option grants vest with respect to 25% of the shares subject to the option on the first anniversary of the date of grant and with respect to the balance of the shares subject to the option in 12 equal quarterly installments over the three-year period thereafter. The exercise price of stock options equals the fair market value of our common stock on the date of grant, which is typically equal to the closing price of our common stock on Nasdaq on the date of compensation committee approval except in the case of new-hire grants, which are approved in advance by the compensation committee with the grant occurring at an exercise price established at the closing price of our common stock on the first day of employment.

In December 2017, as part of its annual executive compensation and performance review, the compensation committee reviewed the 2017 market compensation data regarding annual stock option grants. In January 2018, the committee granted our named executive officers options to purchase shares



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of our common stock. Additionally, in August 2018, in consideration of historical stock performance as well as reference to 2017 market compensation data, the compensation committee further granted our named executive officer options to purchase shares of our common stock. The following table sets forth the number of options granted to our named executive officers in January 2018 and August 2018:

| Executive    | Option Awards               |                            |
|--------------|-----------------------------|----------------------------|
|              | January 2018<br>(# options) | August 2018<br>(# options) |
| Mr. Milano   | 74,999                      | 65,000                     |
| Mr. Fletcher | 33,749                      | 32,500                     |
| Dr. Horobin  | 33,749                      | 32,500                     |
| Mr. Kirby    | 16,874                      | 10,000                     |
| Dr. Yingling | 33,749                      | 32,500                     |
| Mr. Arcudi   | 33,749                      | 32,500                     |

*Benefits and Other Compensation*

We maintain broad-based benefits that are provided to all employees, including health and dental insurance, life and disability insurance, and a 401(k) plan. Through August 2018, consistent with our prior practice, we matched 50% of the employee contributions to our 401(k) plan up to a maximum of 6% of the participating employee's annual salary, resulting in a maximum company match of 3% of the participating employee's annual salary, and subject to certain additional statutory dollar limitations. Commencing in August 2018 and retroactive to January 2018, we matched 100% of the employee contributions to our 401(k) plan up to a maximum of 5% of the participating employee's annual salary. Named executive officers are eligible to participate in all of our employee benefit plans, in each case on the same basis as other employees and subject to any limitations in such plans. Each of our named executive officers except for Mr. Fletcher contributed to our 401(k) plan and their contributions were matched by us.

Our board of directors has adopted a retirement policy to address the treatment of options in the event of an employee's retirement that applies to all employees, including all officers. For purposes of this policy, an employee will be deemed to have retired if the employee terminates his or her employment with us, has been an employee of ours for more than 10 years and is older than 65 upon termination of employment. Under the policy, if an employee retires, then:

all outstanding options held by the employee will automatically vest in full; and

the period during which the employee may exercise the options will be extended to the expiration of the term of the option under the applicable option agreement.

Our board adopted this policy for our employees in recognition of the importance of stock options to the compensation of employees and in order to provide each of our employees with the opportunity to get the full benefit of the options held by the employee in the event of his or her retirement after making 10 years of contributions to our company.

We occasionally pay relocation expenses for newly-hired executive officers who we require to relocate as a condition to their employment by us. We also occasionally pay local housing expenses and travel costs for executives who maintain a primary residence outside of a reasonable daily commuting range to our headquarters. We believe that these are typical benefits offered by comparable companies to executives who are asked to relocate and that we would be at a competitive disadvantage in trying to attract executives who would need to relocate in order to work for us if we did not offer such assistance. We did not provide any relocation benefits to any of our executives in 2018.

Our named executive officers may also participate in our employee stock purchase plan, which is generally available to all employees who work over 20 hours per week, so long as they own less than

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5% of our common stock, including for this purpose vested and unvested stock options. Dr. Horobin, Mr. Kirby and Mr. Arcudi participated in the employee stock purchase plan in 2018.

**Severance and Change in Control Benefits**

Under our employment agreements and employment offer letters with our named executive officers, other than with Mr. Kirby, we have agreed to provide severance and other benefits in the event of the termination of their employment under specified circumstances. On March 7, 2017, the board of directors approved a form of Severance and Change of Control Agreement to be entered into between the Company and our named executive officers. The severance benefits contained in the Change of Control Agreements supersede the severance and change of control terms contained in the existing employment agreements and employment offer letters. We have provided more detailed information about these benefits, along with estimates of their value under various circumstances, under the captions "Employment and Separation Agreements with our Named Executive Officers" and "Potential Payments Upon Termination or Change in Control" below.

We believe providing severance and/or change in control benefits as a component of our compensation structure can help us compete for executive talent and attract and retain highly talented executive officers whose contributions are critical to our long-term success. After reviewing the practices of companies in general industry surveys published by Radford Survey + Consulting, and consultation with Pearl Meyer, we believe that our severance and change in control benefits are appropriate.

**Tax Deductibility of Executive Compensation**

Prior to December 22, 2017, when the TCJA was signed into law, Section 162(m) of the Internal Revenue Code of 1986, as amended (the "Code") generally disallowed a tax deduction to publicly held companies for compensation paid to the chief executive officer and the three other most highly compensated executives (other than the chief financial officer) in excess of \$1 million per officer in any year that such compensation did not qualify as performance-based. In connection with fiscal 2018 compensation decisions, the compensation committee considered the potential tax deductibility of executive compensation under Section 162(m) of the Internal Revenue Code and sought to qualify certain elements of these applicable executives' compensation as performance-based while also delivering competitive levels and forms of compensation.

Under the TCJA, the performance-based exception has been repealed and the \$1 million deduction limit now applies to anyone serving as the chief executive officer or the chief financial officer at any time during the taxable year and the top three other highest compensated executive officers serving at fiscal year end. In addition, once an individual becomes a covered employee under Section 162(m) for any taxable year beginning after December 31, 2016, this status carries forward to all future years, even in the event of the employee's termination or death. The new rules generally apply to taxable years beginning after December 31, 2017, but do not apply to remuneration provided pursuant to a written binding contract in effect on November 2, 2017 that is not modified in any material respect after that date.

The compensation committee reserves the right to use its judgment to authorize compensation payments that may be subject to the limit when the compensation committee believes such payments are appropriate and in the best interests of our company and our stockholders. There can be no assurance that compensation awarded to our executive officers will be treated as qualified performance-based compensation under Section 162(m).

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**Employment and Separation Agreements with our Named Executive Officers**

We have entered into agreements with our named executive officers, as discussed below, that provide benefits to the executives upon their termination of employment in certain circumstances or under which we have agreed to specific compensation elements. Our named executive officers are at-will employees.

***Employment Agreements and Offer Letters***

*Vincent J. Milano*

We are a party to an employment offer letter with Mr. Milano, our President and Chief Executive Officer. Under the employment offer letter, Mr. Milano is entitled to receive an annual base salary of \$600,000 or such higher amount as our compensation committee or our board of directors may determine. In addition, under the employment offer letter, Mr. Milano is eligible to receive an annual bonus of 50% of his base salary, subject to adjustment, based on the achievement of both individual and company performance objectives as developed and determined by our board of directors.

Under the employment offer letter, if we terminate Mr. Milano's employment without cause, prior to a change-in-control, as such terms are defined in the agreement, he will be entitled to severance payments for 24 months equivalent to his then-current base salary, payable in accordance with our then-current payroll practices, and benefits continuation for the shorter of 24 months or the date his COBRA continuation coverage expires and to receive any bonus that he earned and that our board of directors approved prior to the termination to the extent not then paid. If we terminate Mr. Milano's employment without cause or Mr. Milano terminates his employment with us for good reason, as such terms are defined in the agreement, upon or within one year after a change in control, he will be entitled to severance payments for 24 months equivalent to his then-current base salary, payable in accordance with our then-current payroll practices, and benefits continuation for the shorter of 24 months or the date his COBRA continuation coverage expires and to receive any bonus that he earned and that our board of directors approved prior to the termination to the extent not then paid and the inducement option award that he received upon his commencement of employment with us will vest in full and become immediately exercisable.

Our agreement to pay severance and benefits pursuant to the employment offer letter is subject to Mr. Milano entering into a separation and release agreement and is superseded by his severance and change in control agreement described below to the extent then in effect.

*R. Clayton Fletcher*

We are a party to an employment letter with Mr. Fletcher, our Senior Vice President of Business Development and Strategic Planning. Under the terms of the employment letter, Mr. Fletcher is entitled to receive an annual base salary of \$360,000 or such higher amount as our compensation committee or our board of directors may determine. In addition, under the employment letter, Mr. Fletcher is eligible to receive an annual bonus of 35% of his base salary, subject to adjustment, based on the achievement of both individual and company performance objectives as established by our board of directors. Under the employment letter, if we terminate Mr. Fletcher's employment without cause at any time, or if he terminates his employment for good reason upon a change in control or within one year after a change in control, as such terms are defined in the agreement, we have agreed to:

continue to pay Mr. Fletcher his base salary as severance for 12 months following such termination payable in accordance with our then current payroll practices plus any bonus earned and approved by the board of directors but unpaid at the time of termination;

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continue to provide Mr. Fletcher with health and dental benefits for 12 months following such termination, except to the extent another employer provides Mr. Fletcher with comparable benefits; and

only in the event of a termination described above that occurs upon or within one year after a change in control, fully vest all options granted to Mr. Fletcher upon the commencement of his employment.

Our agreement to pay severance and benefits pursuant to the employment offer letter is subject to Mr. Fletcher entering into a separation and release agreement and is superseded by his severance and change in control agreement (described below) to the extent then in effect.

*Joanna Horobin, M.B., Ch.B*

We are a party to an employment letter with Dr. Horobin, our Chief Medical Officer. Under the terms of the employment letter, Dr. Horobin is entitled to receive an annual base salary of \$390,000 or such higher amount as our compensation committee or our board of directors may determine. In addition, under the employment letter, Dr. Horobin is eligible to receive an annual bonus of 40% of her base salary, subject to adjustment, based on the achievement of both individual and company performance objectives as established by our board of directors. Under the employment letter, if we terminate Dr. Horobin's employment without cause at any time, or if she terminates her employment for good reason upon a change in control or within one year after a change in control, as such terms are defined in the agreement, we have agreed to:

continue to pay Dr. Horobin her base salary as severance for 12 months following such termination payable in accordance with our then current payroll practices plus any bonus earned and approved by the board of directors but unpaid at the time of termination;

continue to provide Dr. Horobin with health and dental benefits for 12 months following such termination, except to the extent another employer provides Dr. Horobin with comparable benefits; and

only in the event of a termination described above that occurs upon or within one year after a change in control, fully vest all options granted to Dr. Horobin upon the commencement of her employment.

Our agreement to pay severance and benefits pursuant to the employment offer letter is subject to Dr. Horobin entering into a separation and release agreement and is superseded by her severance and change in control agreement (described below) to the extent then in effect.

*John J. Kirby*

We are a party to an employment letter with Mr. Kirby, our prior Vice President of Corporate Accounting and, effective October 31, 2018, our current Vice President of Finance and principal financial and accounting officer. Under the terms of the employment letter, Mr. Kirby is entitled to receive an annual base salary of \$225,000 or such higher amount as our compensation committee or our board of directors may determine. In addition, under the employment letter, Mr. Kirby is eligible to receive an annual bonus of 30% of his base salary, subject to adjustment, based on the achievement of both individual and company performance objectives as established by our board of directors. Mr. Kirby currently does not have a severance and change in control agreement (described below) with us.

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*Jonathan Yingling, Ph.D.*

We are a party to an employment letter with Dr. Yingling, our prior Senior Vice President of Early Development and, effective January 1, 2018, our current Chief Scientific Officer. Under the terms of the employment letter, Dr. Yingling is entitled to receive an annual base salary of \$385,000 or such higher amount as our compensation committee or our board of directors may determine. In addition, under the employment letter, Dr. Yingling is eligible to receive an annual bonus of 40% of his base salary, subject to adjustment, based on the achievement of both individual and company performance objectives as established by our board of directors. Under the employment letter, if we terminate Dr. Yingling's employment without cause at any time, or if he terminates his employment for good reason upon a change in control or within one year after a change in control, as such terms are defined in the agreement, we have agreed to:

continue to pay Dr. Yingling his base salary as severance for 12 months following such termination payable in accordance with our then current payroll practices plus any bonus earned and approved by the board of directors but unpaid at the time of termination;

continue to provide Dr. Yingling with health and dental benefits for 12 months following such termination, except to the extent another employer provides Dr. Yingling with comparable benefits; and

only in the event of a termination described above that occurs upon or within one year after a change in control, fully vest all options granted to Dr. Yingling upon the commencement of his employment.

Our agreement to pay severance and benefits pursuant to the employment offer letter is subject to Dr. Yingling entering into a separation and release agreement and is superseded by his severance and change in control agreement (described below) to the extent then in effect.

*Louis J. Arcudi, III*

Prior to his resignation on October 31, 2018, the terms of Mr. Arcudi's employment as our Senior Vice President of Operations, Chief Financial Officer, Treasurer and Assistant Secretary were set forth in an employment letter, as amended, with Mr. Arcudi. Under the employment letter, Mr. Arcudi was initially entitled to receive an annual base salary of \$315,000, such amount subject to adjustment from time to time in accordance with normal business practices. In addition, under the employment letter, Mr. Arcudi was entitled to receive an annual bonus in an amount approved by our board or the compensation committee based on the achievement of both individual and company performance objectives as developed and determined by our board of directors.

Pursuant to his employment letter, if we terminated Mr. Arcudi's employment without cause at any time, or if he terminated his employment for good reason upon a change in control or within one year after a change of control, as such terms are defined in the agreement, we agreed to:

continue to pay Mr. Arcudi his base salary as severance for 12 months following such termination payable in accordance with our then current payroll practices; and

continue to provide Mr. Arcudi with health and dental benefits for 12 months following such termination, except to the extent another employer provides Mr. Arcudi with comparable benefits.

Our agreement to pay severance and benefits pursuant to the employment letter is subject to Mr. Arcudi entering into a separation and release agreement and is superseded by his severance and change in control agreement described below to the extent then in effect.

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On October 31, 2018, we entered into a separation agreement and release with Mr. Arcudi, under which Mr. Arcudi agreed to resign as our Senior Vice President of Operations, Chief Financial Officer, Treasurer and Assistant Secretary. Pursuant to the agreement, we provided Mr. Arcudi the following separation benefits in exchange for him agreeing to a release of claims and complying with certain other continuing obligations contained therein (including compliance with the restrictive covenants in his employment agreement):

We paid Mr. Arcudi a pro-rated 2018 bonus payment of \$103,182, less all applicable taxes and withholdings;

We have agreed that, commencing on the first regular payroll date following his separation date until October 31, 2019, we will pay Mr. Arcudi with severance pay in the total gross amount of \$525,115, payable in equal installments in accordance with our regular payroll practices;

Mr. Arcudi is eligible to receive health and dental benefits through reimbursement of COBRA premiums from his separation date through no later than October 31, 2019; and

Any stock options or other equity incentive awards previously granted to Mr. Arcudi and held by Mr. Arcudi on his separation date shall continue to remain exercisable until the earlier of (i) twelve months from the end of the quarter in which Mr. Arcudi terminates services from the with us, or (ii) the original expiration date of such option.

In addition, we (a) paid all of Mr. Arcudi's compensation due and owing to him as of October 31, 2018 in accordance with our usual compensation and payroll practices, and (b) reimbursed Mr. Arcudi for all reasonable unreimbursed business expenses incurred by him as of October 31, 2018 in accordance with our expense reimbursement policy.

Mr. Arcudi also entered into a consulting agreement with us, effective October 31, 2018, under which Mr. Arcudi agreed to provide consulting services to us, and we have agreed to pay Mr. Arcudi consulting fees at a rate of \$500 per hour for any such services provided, not to exceed \$50,000 without our consent, as well as reimbursement for pre-approved reasonable expenses for a term of twelve months. The agreement also contains non-solicit provisions that apply during the consulting period and the one-year period thereafter.

***Severance and Change in Control Agreements***

We have entered into a Severance and Change of Control Agreement with each of Messrs. Milano, Arcudi and Fletcher, and Drs. Yingling and Horobin.

The Severance and Change of Control Agreements provide that if we consummate a change of control (as defined in the Severance and Change of Control Agreements), we will employ the executive for a period of 24 months from the date of the consummation of the change of control. Pursuant to the Severance and Change of Control Agreements, during such period:

- (i) the executive's position and duties for the company will be commensurate with the most significant of the duties and positions held by the executive during the 90 day period preceding the date of the consummation of the change of control;
- (ii) the executive's annual base salary will equal at least 12 times the highest monthly base salary paid to the executive during the 12 months prior to the date of the change of control;
- (iii) the executive will be entitled to an annual bonus equal to at least the greatest of (a) the average bonus paid to the executive in respect of the three years immediately preceding the year in which the change of control occurs, (b) the annual bonus paid for the year immediately preceding the year in which the change of control occurs and (c) 100% of the target bonus for (1) the year immediately preceding the year in which the change of control

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occurs, (2) the year in which the change of control occurs or (3) any year following the year in which the change of control occurs and prior to the then-current year, whichever is highest; and

(iv)

the executive will be entitled to certain other benefits as are consistent with the benefits paid to the executive during the year prior to the change of control.

The Severance and Change of Control Agreements also provide that if an executive is terminated without "cause" or resigns for "good reason" (as such terms are defined in the Severance and Change of Control Agreements) in either case, within 24 months following a change of control, subject to the executive's timely execution and non-revocation of a general release of claims in a form provided by us and the executive's continued compliance with the invention, non-disclosure and non-competition agreement previously entered into in connection with the commencement of executive's employment, executives would receive a lump sum cash payment payable within 30 days after the date of termination equal to:

(i)

the executive's target bonus for the year of termination prorated for the portion of the year worked;

(ii)

150% of the sum of (a) such executive's annual base salary for the year immediately preceding the year of termination and (b) the greatest of (1) the average bonus paid or earned and accrued, but unpaid to the executive in respect of the three years immediately preceding the year of termination, (2) the annual bonus paid for the year immediately preceding the year of termination and (3) the target bonus for the year of termination; and

(iii)

150% of the Company's share of the annual premium for group medical and/or dental insurance coverage that was in place for the executive immediately prior to the date of termination.

In addition, all unvested options, restricted stock or stock appreciation rights held by the executive as of the date of termination will be immediately and automatically vested and/or exercisable in full as of the date of termination, and the executive will have the right to exercise any such options or stock appreciation rights for the longer of (A) the period of time provided for in the applicable equity award agreement or plan, or (B) the shorter of one year after the date of termination or the remaining term of the applicable equity award. However, under the terms of the Merger Agreement the post-termination exercise period of all outstanding stock options will continue in the event of the executive's termination of employment within 24 months following the effective time of the Mergers (other than for cause or due to the executive's resignation without good reason), until the three-year anniversary of such executive's termination, but in no event past the remaining term of the applicable equity award.

If the executive is terminated without "cause" or resigns for "good reason," prior to the date of a change of control, such executive will be entitled to the following under the Severance and Change of Control Agreement, subject to the executive's timely execution and non-revocation of a general release of claims in a form provided by us and the executive's continued compliance with the invention, non-disclosure and non-competition agreement previously entered into in connection with the commencement of executive's employment:

(i)

a lump sum cash payment payable within 30 days after the date of termination in an amount equal to the greater of (x) the average bonus paid or earned and accrued, but unpaid to the executive in respect of the three years immediately preceding the year of termination, and (y) the annual bonus paid for the year immediately preceding the year of termination prorated for the portion of the year worked;

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- (ii) continued payment of the executive's base salary payable in accordance with our standard payroll practices over the one-year period following termination; and
- (iii) if the executive elects to continue receiving group medical and/or dental insurance under COBRA (to the extent the executive previously participated in such group insurance plans immediately prior to the date of termination), payment by us of our share of the premium for such coverage that we pay for active and similarly-situated employees who receive the same type of coverage for the one-year period following termination.

The Severance and Change of Control Agreements expire on December 31, 2018, but on each anniversary thereof, unless notice of termination has been provided by a party, the term of such agreements will automatically be extended by one year.

**Indemnification Agreements**

On March 7, 2017, the board of directors approved a form of Indemnification Agreement to be entered into between the Company and our directors and officers. Each of Messrs. Milano, Arcudi, Fletcher and Kirby and Drs. Horobin and Yingling entered into an Indemnification agreement with the Company. In general, the Indemnification Agreements provide that the Company will indemnify the director or officer to the fullest extent permitted by law for claims arising in his or her capacity as a director or officer of the Company or in connection with their service at our request for another corporation or entity. The Indemnification Agreements also provide for procedures that will apply in the event that a director or officer makes a claim for indemnification and establish certain presumptions that are favorable to the director or officer.

**Formal Clawback Policy**

In April 2015, ahead of any such requirement in the Dodd-Frank Wall Street Reform and Consumer Protection Act, our compensation committee adopted a formal clawback policy, which will apply in the event we are required to prepare an accounting restatement after the adoption of the clawback policy due to any material noncompliance with any financial reporting requirement under the U.S. federal securities laws. This policy requires us to use reasonable efforts to recover from any of our current or former executive officers who receive incentive-based compensation (including stock options awarded as compensation) during the three-year period preceding the date on which we are required to prepare an accounting restatement based on erroneous data, the excess of what would have been paid to such executive officer under the accounting restatement.



Table of Contents**Summary Compensation Table**

The table below summarizes compensation paid to or earned by our named executive officers for 2018, 2017 and 2016.

**Summary Compensation Table for Fiscal Year 2018**

| Name and Principal Position  | Year | Salary<br>(\$) | Bonus<br>(\$) | Option<br>Awards<br>\$(1) | Non-Equity<br>Incentive      | All Other<br>Compensation<br>\$(2) | Total<br>(\$) |
|--|------|----------------|---------------|---------------------------|------------------------------|------------------------------------|---------------|
|  |      |                |               |                           | Plan<br>Compensation<br>(\$) |                                    |               |
| <b>Vincent J. Milano</b>   | 2018 | 600,000        |               | 998,081                   | 150,000                      | 33,863                             | 1,781,944     |
| President and Chief<br>Executive Officer   | 2017 | 600,000        |               | 296,634                   | 270,000                      | 31,106                             | 1,197,740     |
|  | 2016 | 600,000        |               | 573,780                   | 211,680                      | 31,555                             | 1,417,015     |
| <b>R. Clayton Fletcher</b>   | 2018 | 400,000        |               | 461,837                   | 92,000                       | 23,613                             | 977,450       |
| Senior Vice President,<br>Business Development<br>and Strategy   | 2017 | 386,300        |               | 182,924                   | 145,908                      | 22,988                             | 738,120       |
|  | 2016 | 375,000        |               | 353,831                   | 114,660                      | 23,580                             | 867,071       |
| <b>Joanna Horobin</b>  | 2018 | 425,000        |               | 461,837                   | 72,250                       | 34,838                             | 993,925       |
| Senior Vice President,<br>Chief Medical Officer  | 2017 | 410,000        |               | 182,924                   | 132,840                      | 31,754                             | 757,518       |
|  | 2016 | 390,000        |               |                           | 119,246                      | 31,187                             | 540,433       |
| <b>John J. Kirby</b>   | 2018 | 249,888        |               | 206,479                   | 64,771                       | 32,735                             | 553,873       |
| Vice President of Finance,<br>Principal Financial and Accounting<br>Officer(3)                                     | 2017 | 231,750        |               | 98,878                    | 62,573                       | 28,676                             | 421,877       |
|  | 2016 | 225,000        |               | 172,150                   | 54,607                       | 28,540                             | 480,297       |
| <b>Jonathan Yingling</b>   | 2018 | 400,000        |               | 461,837                   | 80,000                       | 33,926                             | 975,763       |
| Senior Vice President,<br>Chief Scientific Officer(4)  | 2017 | 348,542        |               | 577,782                   | 144,296                      | 31,277                             | 1,101,897     |
| <b>Louis J. Arcudi, III</b>  | 2018 | 308,333        | 103,183(6)    | 461,837                   |                              | 112,776                            | 986,129       |
| Former Senior Vice<br>President of Operations,<br>Chief Financial Officer, Treasurer and<br>Assistant Secretary(5) | 2017 | 357,900        |               | 182,924                   | 122,436                      | 25,786                             | 689,046       |
|  | 2016 | 347,500        |               | 353,831                   | 116,760                      | 26,276                             | 844,367       |

- (1) Represents the aggregate grant date fair value of options granted to each of the named executive officers as computed in accordance with ASC 718. These amounts do not represent the actual amounts paid to or realized by the named executive officers. See Note 11 to the financial statements included elsewhere in our annual report on Form 10-K for the year ended December 31, 2018 regarding assumptions we made in determining the fair value of option awards.

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- (2) "All Other Compensation" for 2018 for each of the named executive officers includes the following:

|              | Premiums paid<br>by us<br>for all<br>insurance<br>plans (\$) | Company match<br>on 401(k)<br>(\$) | Severance<br>(\$) | Total<br>(\$) |
|--------------|--|------------------------------------|-------------------|---------------|
| Mr. Milano   | 23,613   | 10,250                             |                   | 33,863        |
| Mr. Fletcher | 23,613   |                                    |                   | 23,613        |
| Dr. Horobin  | 24,525   | 10,313                             |                   | 34,838        |
| Mr. Kirby    | 23,239   | 9,496                              |                   | 32,735        |
| Dr. Yingling | 23,613   | 10,313                             |                   | 33,926        |
| Mr. Arcudi   | 14,944   | 10,313                             | 87,519            | 112,776       |

- (3) Upon Mr. Kirby's appointment as our principal financial officer and principal accounting officer effective October 31, 2018, Mr. Kirby's annual base salary was increased from \$239,850 to \$280,000.
- (4) Dr. Yingling joined our company and became our Senior Vice President, Early Development effective as of February 6, 2017 and has served as our Chief Scientific Officer since January 1, 2018.
- (5) Mr. Arcudi served as our Senior Vice President of Operations, Chief Financial Officer, Treasurer and Assistant Secretary until his resignation, effective October 31, 2018.
- (6) Pursuant to Mr. Arcudi's separation agreement, Mr. Arcudi received a pro-rated cash bonus in 2018 calculated as the product of (i) the greater of (a) the average bonus paid or that has been earned and accrued, but unpaid to Mr. Arcudi by us, in respect of the three fiscal years immediately preceding the fiscal year in which the separation date occurred, and (b) the annual bonus paid for the fiscal year immediately preceding the separation date (both (a) and (b) annualized for any fiscal year consisting of less than twelve full months or with respect to which Mr. Arcudi has been employed by us for less than twelve full months) and (ii) a fraction, the numerator of which is the number of days in the current fiscal year through the separation date, and the denominator of which is 365.

**CEO Pay Ratio**

Following is a reasonable estimate, prepared under applicable SEC rules, of the ratio of the annual total compensation of our CEO to the median of the annual total compensation of our other employees. We determined our median employee based on annualized 2018 base salary and annualized 2018 bonus awards for each of our 36 employees (excluding the CEO) as of December 31, 2018. The annual total compensation of our median employee (other than the CEO) for 2018 was \$297,391. As disclosed in the Summary Compensation Table included in this CD&A, our CEO's annual total compensation for 2018 was \$1,781,944. Based on the foregoing, the ratio of the 2018 annual total compensation of our CEO to the median of the annual total compensation of all other employees was 6 to 1. Given the different methodologies that various public companies will use to determine an estimate of their pay ratio, the estimated ratio reported above should not be used as a basis for comparison between companies.

**Grants of Plan-Based Awards**

The following table sets forth information regarding grants of plan-based awards to our named executive officers during 2018.

Table of Contents**Grants of Plan-Based Awards for Fiscal Year 2018**

| Name                    | Grant Date   | Estimated Possible Payouts Under Non-Equity Incentive Plan Awards |             |              | All Other Option Awards: Number of Securities Underlying Options (#)(1) | Exercise or Base Price of Option Awards (\$/Sh) | Grant Date Fair Value of Option Awards \$(2) |
|-------------------------|--------------|---|-------------|--------------|---|---|--|
|                         |              | Threshold (\$)  | Target (\$) | Maximum (\$) |   |   |  |
| Vincent J. Milano       | 1/3/2018(3)  |   | 300,000     | 468,750      | 74,999  | 17.92   | 743,965                                      |
|                         | 8/13/2018(3) |   |             |              | 65,000  | 7.39  | 254,116                                      |
| R. Clayton Fletcher     | 1/3/2018(3)  |   | 160,000     | 250,000      | 33,749  | 17.92   | 334,779                                      |
|                         | 8/13/2018(3) |   |             |              | 32,500  | 7.39  | 127,058                                      |
| Joanna Horobin          | 1/3/2018(3)  |   | 170,000     | 265,625      | 33,749  | 17.92   | 334,779                                      |
|                         | 8/13/2018(3) |   |             |              | 32,500  | 7.39  | 127,058                                      |
| John J. Kirby           | 1/3/2018(3)  |   | 74,966      | 117,135      | 16,874  | 17.92   | 167,384                                      |
|                         | 8/13/2018(3) |   |             |              | 10,000  | 7.39  | 39,095                                       |
| Jonathan Yingling       | 1/3/2018(3)  |   | 160,000     | 250,000      | 33,749  | 17.92   | 334,779                                      |
|                         | 8/13/2018(3) |   |             |              | 32,500  | 7.39  | 127,058                                      |
| Louis J. Arcudi, III(4) | 1/3/2018(3)  |   | 123,333     | 192,708      | 33,749  | 17.92   | 334,779                                      |
|                         | 8/13/2018(3) |   |             |              | 32,500  | 7.39  | 127,058                                      |

- (1) The term of these options is ten years. The vesting of these stock options is time-based. See "Compensation Discussion and Analysis Components of Executive Compensation Equity Compensation" for a full description of the vesting terms for these options. See "Employment and Separation Agreements with our Named Executive Officers" for further information about acceleration of vesting of options in the event of the termination of employment and/or a change of control.
- (2) Represents the aggregate grant date fair value of option awards made to the named executive officers in 2017 as computed in accordance with ASC 718. These amounts do not represent the actual amounts paid to or realized by the named executive officers during 2018. See Note 11 to the financial statements included elsewhere in our annual report on Form 10-K for the year ended December 31, 2018 regarding assumptions we made in determining the fair value of option awards.
- (3) Granted pursuant to our 2013 Stock Incentive Plan.
- (4) The target and maximum amounts reported under Estimated Possible Payouts Under Non-Equity Incentive Plan Awards for Mr. Arcudi are pro-rated for Mr. Arcudi's resignation effective October 31, 2018. Pursuant to the Separation Agreement and Release dated October 31, 2018 by and between Mr. Arcudi and us, Mr. Arcudi received a pro-rated bonus for 2018 in the amount of \$103,183, the calculation of which is more fully described in the footnotes to the "Summary Compensation Table for Fiscal Year 2018."



Table of Contents**Outstanding Equity Awards at Fiscal Year-End**

The following table sets forth information regarding the outstanding stock options held by our named executive officers as of December 31, 2018. None of our named executive officers held shares of unvested restricted stock as of December 31, 2018.

**Outstanding Equity Awards at Fiscal Year-End for 2018**

| Name                 | Number of Securities Underlying Unexercised Options (#) Exercisable | Number of Securities Underlying Unexercised Options (#) Unexercisable | Option Exercise Price (\$) | Option Expiration Date |
|----------------------|---|---|----------------------------|------------------------|
| Vincent J. Milano    | 250,000   |   | 24.96                      | 12/1/2024              |
|                      | 25,780  | 11,719(1)   | 23.04                      | 1/6/2026               |
|                      | 16,406  | 21,094(2)   | 12.72                      | 1/4/2027               |
|                      |   | 74,999(3)   | 17.92                      | 1/3/2028               |
|                      |   | 65,000(4)   | 7.39                       | 8/13/2028              |
| R. Clayton Fletcher  | 70,312  | 4,688(5)  | 37.36                      | 1/26/2025              |
|                      | 15,897  | 7,227(1)  | 23.04                      | 1/6/2026               |
|                      | 10,117  | 13,007(2)   | 12.72                      | 1/4/2027               |
|                      |   | 33,749(3)   | 17.92                      | 1/3/2028               |
|                      |   | 32,500(4)   | 7.39                       | 8/13/2028              |
| Joanna Horobin       | 56,248  | 18,751(6)   | 31.04                      | 11/30/2025             |
|                      | 10,117  | 13,007(2)   | 12.72                      | 1/4/2027               |
|                      |   | 33,749(3)   | 17.92                      | 1/3/2028               |
|                      |   | 32,500(4)   | 7.39                       | 8/13/2028              |
| John J. Kirby        | 14,061  | 4,689(7)  | 24.88                      | 11/2/2025              |
|                      | 7,734   | 3,515(1)  | 23.04                      | 1/6/2026               |
|                      | 5,468   | 7,031(2)  | 12.72                      | 1/4/2027               |
|                      |   | 16,874(3)   | 17.92                      | 1/3/2028               |
|                      |   | 10,000(4)   | 7.39                       | 8/13/2028              |
| Jonathan Yingling    | 32,811  | 42,188(8)   | 12.40                      | 2/6/2027               |
|                      |   | 33,749(3)   | 17.92                      | 1/3/2028               |
|                      |   | 32,500(4)   | 7.39                       | 8/13/2028              |
| Louis J. Arcudi, III | 13,749  |   | 41.92                      | 12/23/2019             |
|                      | 11,874  |   | 21.92                      | 12/27/2020             |
|                      | 18,247  |   | 9.26                       | 11/28/2021             |
|                      | 43,541  |   | 5.52                       | 5/22/2023              |
|                      | 37,500  |   | 20.48                      | 12/10/2023             |
|                      | 24,999  |   | 31.76                      | 12/10/2024             |
|                      | 15,898  | 7,226(1)  | 23.04                      | 1/6/2026               |
|                      | 10,117  | 13,007(2)   | 12.72                      | 1/4/2027               |
|                      |   | 33,749(3)   | 17.92                      | 1/3/2028               |
|                      |   | 32,500(4)   | 7.39                       | 8/13/2028              |

(1)

Represents vested portion of stock option award that vested 25% on January 6, 2017 (first anniversary date following the January 6, 2016 grant date), with the remainder vesting in 12 equal



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quarterly installments thereafter (until January 6, 2020), provided the named executive officer is still employed with us on each vesting date.

- (2) Represents unvested portion of stock option award that vested 25% on January 4, 2018 (first anniversary date following the January 4, 2017 grant date), with the remainder vesting in 12 equal quarterly installments thereafter (until January 4, 2021), provided the named executive is still employed with us on each vesting date.
- (3) Represents unvested portion of stock option award that will vest 25% on the first anniversary date following the January 3, 2018 grant date, with the remainder vesting in 12 equal quarterly installments thereafter (until January 3, 2022), provided the named executive is still employed with us on each vesting date.
- (4) Represents unvested portion of stock option award that will vest 25% on the first anniversary date following the August 13, 2018 grant date, with the remainder vesting in 12 equal quarterly installments thereafter (until August 13, 2022), provided the named executive is still employed with us on each vesting date.
- (5) Represents unvested portion of stock option award that vested 25% on January 26, 2016 (first anniversary date following the January 26, 2015 grant date), with the remainder vesting in 12 equal quarterly installments thereafter (until January 26, 2019), provided the named executive is still employed with us on each vesting date.
- (6) Represents unvested portion of stock option award that vested 25% on November 30, 2016 (first anniversary date following the November 30, 2015 grant date), with the remainder vesting in 12 equal quarterly installments thereafter (until November 30, 2019), provided the named executive is still employed with us on each vesting date.
- (7) Represents unvested portion of stock option award that vested 25% on November 2, 2016 (first anniversary date following the November 2, 2015 grant date), with the remainder vesting in 12 equal quarterly installments thereafter (until November 2, 2019), provided the named executive is still employed with us on each vesting date.
- (8) Represents unvested portion of stock option award that will vest 25% on the first anniversary date following the February 6, 2017 grant date, with the remainder vesting in 12 equal quarterly installments thereafter (until February 6, 2021), provided the named executive is still employed with us on each vesting date.

**Option Exercises and Stock Vested**

None of our named executive officers exercised any options during the year ended December 31, 2018.

**Potential Payments Upon Termination or Change in Control**

Under our employment agreement and employment offer letters with our executive officers, we have agreed to provide severance and other benefits in the event of the termination of their employment under specified circumstances. These agreements are described above under the caption "Employment and Separation Agreements with our Named Executive Officers."

However, in March 2017, we entered into a Severance and Change of Control Agreement with each of Messrs. Milano, Arcudi and Fletcher, and Drs. Horobin and Yingling that superseded the severance and change in control provisions of each of their respective employment offer letters. These agreements are also described above under the caption "Employment and Separation Agreements with our Named Executive Officers."

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In October 2018, we entered into a separation agreement and release with Mr. Arcudi, in connection with Mr. Arcudi's resignation effective October 31, 2018, as our Senior Vice President of Operations, Chief Financial Officer, Treasurer and Assistant Secretary, and we agreed to provide him certain severance benefits and other compensation. This agreement is described above under the caption "Employment and Separation Agreements with our Named Executive Officers," and the payments upon Mr. Arcudi's resignation were paid in accordance with this agreement and are set forth above in the "Summary Compensation Table."

### Termination of Employment Not In Connection With or Following a Change in Control

The following table sets forth the estimated potential benefits that our named executive officers would be entitled to receive upon their termination of employment with our company (other than a termination in connection with or following a change in control of our company) if the named executive officer's employment was terminated on December 31, 2018. This table represents estimates only and does not necessarily reflect the actual amounts that would be paid to our named executive officers, which would only be known at the time that they become eligible for payment following their termination.

| Name                | Cash Severance(1)<br>(\$) | Perquisites/<br>Benefits(2)<br>(\$) | Total<br>(\$) |
|---------------------|---------------------------|-------------------------------------|---------------|
| Vincent J. Milano   | 810,560                   | 25,414                              | 835,974       |
| R. Clayton Fletcher | 517,523                   | 25,414                              | 542,937       |
| Joanna Horobin      | 533,112                   | 25,414                              | 558,526       |
| John J. Kirby(3)    |                           |                                     |               |
| Jonathan Yingling   | 519,695                   | 25,414                              | 545,109       |

(1)

Cash severance under the Severance and Change of Control Agreements would be payable to Messrs. Milano and Fletcher, and Drs. Horobin and Yingling upon a termination of the executive's employment by the executive for "good reason" or by us without "cause", in either case, subject to the executive's timely execution and non-revocation of a general release of claims in a form provided by the Company and the executive's continued compliance with the invention, non-disclosure and non-competition agreement previously entered into in connection with the commencement of executive's employment. In such an event, executives would receive:

(i)

a lump sum cash payment payable within 30 days after the date of termination equal to the greater of (1) the average bonus paid or earned and accrued, but unpaid to the executive in respect of the three fiscal years immediately preceding the