

Spark Therapeutics, Inc.
Form DEF 14A
April 20, 2018

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

Filed by 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 Pursuant to §240.14a-12

Spark Therapeutics, Inc.

(Exact Name of Registrant as Specified in its Charter)

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

Payment of Filing Fee (Check the appropriate box):

No fee required.

Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

(1) Title of each class of securities to which transaction applies:

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

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

(4) Proposed maximum aggregate value of transaction:

(5) Total fee paid:

Fee paid previously with preliminary materials.

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

- (1) Amount Previously Paid:
 - (2) Form, Schedule or Registration Statement No.:
 - (3) Filing Party:
 - (4) Date Filed:
-

April 20, 2018

Dear Fellow Stockholder:

You are cordially invited to attend the 2018 Annual Meeting of Stockholders, or Annual Meeting, of Spark Therapeutics, Inc., or the Company or Spark. The meeting will be held on May 30, 2018 at 8:30 a.m. Eastern Daylight Time, or EDT, at The Study at University City, 20 S. 33rd Street, Philadelphia, Pennsylvania 19104.

Details regarding attendance at the meeting and the business to be conducted are more fully described in the accompanying Notice of Annual Meeting and Proxy Statement.

At the Annual Meeting, the agenda includes the election of three (3) Class III directors for a three (3) year term, the approval, by non-binding vote, of executive compensation, and the ratification of the appointment of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2018.

Under Securities and Exchange Commission rules, the Company is providing access to the proxy materials for the Annual Meeting via the Internet. Accordingly, you can access the proxy materials and vote at www.proxyvote.com.

Instructions for accessing the proxy materials and voting are described below and in the Notice of Annual Meeting that you received in the mail. Your vote is very important. Whether or not you plan to attend the meeting, please carefully review the enclosed proxy statement and then cast your vote, regardless of the number of shares you hold. If you are a stockholder of record, you may vote over the Internet, by telephone or, if you request to receive a printed set of the proxy materials, by completing, signing, dating and mailing the accompanying proxy card in the return envelope. Submitting your vote via the Internet or by telephone or proxy card will not affect your right to vote in person if you decide to attend the Annual Meeting. If your shares are held in street name (held for your account by a broker or other nominee), you will receive instructions from your broker or other nominee explaining how to vote your shares and you will have the option to cast your vote by telephone or over the Internet if your voting instruction form from your broker or nominee includes instructions and a toll-free telephone number or Internet website to do so. In any event, to be sure that your vote will be received in time, please cast your vote by your choice of available means at your earliest convenience.

Your continuing interest in the Company is very much appreciated.

Sincerely,

/s/ Jeffrey D. Marrazzo

Jeffrey D. Marrazzo

Chief Executive Officer

NOTICE OF 2018 ANNUAL MEETING OF STOCKHOLDERS

- Time** 8:30 a.m., EDT
- Date** May 30, 2018
- Place** The Study at University City, 20 S. 33rd Street, Philadelphia, Pennsylvania 19104.
- Purpose**
1. To elect Jeffrey D. Marrazzo, Vincent J. Milano and Elliott Sigal, M.D., Ph.D., as Class III members of the Board of Directors to serve until their successors are duly elected and qualified;
 2. To hold an advisory vote on the compensation paid to the Company's named executive officers;
 3. To ratify the selection of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2018; and
 4. To transact any other business that may properly come before the Annual Meeting or any adjournment thereof.
- Record Date** The Board of Directors has fixed the close of business on April 9, 2018, as the record date for determining stockholders entitled to notice of and to vote at the meeting.
- Meeting Attendance** All stockholders as of the record date, or their duly appointed proxies, are invited to attend the meeting. If you attend, you will be asked to present valid picture identification such as a driver's license or passport.
- Voting by Proxy** If you are a stockholder of record, please vote via the Internet or, for shares held in street name, please submit the voting instruction form you receive from your broker or nominee as soon as possible so your shares can be voted at the meeting. You may submit your voting instruction form by mail. If you are a stockholder of record, you also may vote by telephone or by submitting a proxy card by mail. If your shares are held in street name, you will receive instructions from your broker or other nominee explaining how to vote your shares, and you also may have the choice of instructing the record holder as to the voting of your shares over the Internet or by telephone. Follow the instructions on the voting instruction form you received from your broker or nominee.

By order of the Board of Directors,

/s/ Joseph W. La Barge
Joseph W. La Barge
Secretary
Philadelphia, Pennsylvania
April 20, 2018

Important notice regarding the availability of proxy materials for the Spark Therapeutics, Inc. 2018 Annual Meeting of Stockholders to be held on May 30, 2018: The Notice of 2018 Annual Meeting of Stockholders, proxy statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 are available at www.sparktx.com by following the link for "Investors". To obtain directions to The Study at University City in order to attend the Annual Meeting in person, please visit the "Investors - Events" section of our website at www.sparktx.com or contact Investor

Relations at (855) 772-7589.

TABLE OF CONTENTS

	PAGE
<u>Information about the Annual Meeting and Voting</u>	<u>1</u>
<u>Votes Required</u>	<u>3</u>
<u>Proposal 1: Election of Class III Directors</u>	<u>5</u>
<u>How Our Board is Organized</u>	<u>6</u>
<u>Director Biographies</u>	<u>6</u>
<u>Director Independence</u>	<u>9</u>
<u>Board Committees</u>	<u>9</u>
<u>Compensation Committee Interlocks and Insider Participation</u>	<u>11</u>
<u>Board Meetings and Attendance</u>	<u>11</u>
<u>Board Processes</u>	<u>11</u>
<u>Policies and Procedures for Related-Person Transactions</u>	<u>13</u>
<u>Stockholder Proposals</u>	<u>14</u>
<u>Proposal 2: Advisory Vote on Executive Compensation</u>	<u>15</u>
<u>Executive Officers and Director Compensation</u>	<u>16</u>
<u>Equity Incentive and Other Compensation Plans</u>	<u>37</u>
<u>Risk Considerations in Our Compensation Program</u>	<u>42</u>
<u>Security Ownership of Certain Beneficial Owners, Management and Related Stockholders Matters</u>	<u>43</u>
<u>Certain Relationships and Related Transactions and Director Independence</u>	<u>45</u>
<u>Section 16(a) Beneficial Ownership Reporting Compliance</u>	<u>45</u>
<u>Audit Committee Report</u>	<u>45</u>
<u>Proposal 3: Ratification of Selection of Independent Registered Public Accounting Firm</u>	<u>47</u>
<u>Auditor's Fees</u>	<u>47</u>
<u>Policies on Reporting of Concerns Regarding Accounting and Other Matters and On Communicating with</u>	<u>48</u>
<u>Non-Management Directors</u>	<u>48</u>
<u>Where You Can Find More Information</u>	<u>48</u>
<u>Form 10-K</u>	<u>48</u>
<u>Householding of Annual Meeting Materials</u>	<u>49</u>
<u>Other Business</u>	<u>49</u>

SPARK THERAPEUTICS, INC.
3737 MARKET STREET
SUITE 1300
PHILADELPHIA, PA 19104
PROXY STATEMENT
FOR THE 2018 ANNUAL MEETING OF STOCKHOLDERS
TO BE HELD ON MAY 30, 2018
AT 8:30 AM EDT

INFORMATION ABOUT THE ANNUAL MEETING AND VOTING

When are this proxy statement and the accompanying materials scheduled to be sent to stockholders?

We have elected to provide access to our proxy materials for the Annual Meeting to our stockholders via the Internet. Accordingly, on or about April 20, 2018, we will begin mailing a Notice of Internet Availability of Proxy Materials, or Notice of Internet Availability, and all other proxy materials, including the Notice of 2018 Annual Meeting of Stockholders, this proxy statement and accompanying proxy card. For shares held in street name (held for your account by a broker or other nominee), a voting instruction form and the Annual Report on Form 10-K for the fiscal year ended December 31, 2017 will be made available to stockholders on the Internet on the same date.

Why did I receive a Notice of Internet Availability instead of a full set of proxy materials?

Pursuant to rules adopted by the U.S. Securities and Exchange Commission, or SEC, we are providing access to our proxy materials over the Internet rather than printing and mailing the proxy materials. We believe electronic delivery will expedite the receipt of materials and will help lower our costs and reduce the environmental impact of our Annual Meeting materials. Therefore, a Notice of Internet Availability will be mailed to holders of record and beneficial owners of our common stock starting on or around April 20, 2018. The Notice of Internet Availability will provide instructions as to how stockholders may access and review the proxy materials, including the Notice of Annual Meeting, proxy statement, proxy card and Annual Report on Form 10-K, on the website referred to in the Notice of Internet Availability or, alternatively, how to request that a copy of the proxy materials, including a proxy card, be sent to them by mail. The Notice of Internet Availability also will provide voting instructions. In addition, stockholders of record may request to receive the proxy materials in printed form by mail or electronically by e-mail on an ongoing basis for future stockholder meetings. Please note that while our proxy materials are available at the website referenced in the Notice of Internet Availability, and our Notice of Annual Meeting, proxy statement and Annual Report on Form 10-K are available on our website, no other information contained on either website is incorporated by reference in, or considered to be a part of, this document.

Who is soliciting my vote?

The Board of Directors of Spark, or the Board, is soliciting your vote for the Annual Meeting.

When is the record date for the Annual Meeting?

The Board has fixed the record date for the Annual Meeting as of the close of business on April 9, 2018.

How many votes can be cast by all stockholders?

A total of 37,282,344 shares of common stock of the Company were outstanding on April 9, 2018, and entitled to be voted at the Annual Meeting. Each share of common stock is entitled to one vote on each matter.

How do I vote?

If you are a stockholder of record and your shares are registered directly in your name, you may vote:

By Internet. Access the website of the Company's tabulator, Broadridge, at: www.proxyvote.com, using the voter control number printed on the furnished proxy card. Your shares will be voted in accordance with your instructions.

You must specify how you want your shares voted or your Internet vote cannot be completed and you will receive an error message. If you vote on the Internet, you also may request electronic delivery of future proxy materials.

By Telephone. Call 1-800-690-6903 toll-free from the U.S., U.S. territories and Canada and follow the instructions on the enclosed proxy card. Your shares will be voted in accordance with your instructions. You must specify how you want your shares voted or your telephone vote cannot be completed.

By Mail. If you request printed proxy materials, complete and mail a proxy card in the postage prepaid envelope provided with such materials to Broadridge. Your proxy will be voted in accordance with your instructions. If you sign and return the enclosed proxy but do not specify how you want your shares voted, they will be voted FOR the election of the Class III director nominees named herein to the Board, FOR the advisory resolution approving the compensation of the named executive officers and FOR the ratification of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2018, and will be voted according to the discretion of the proxy holder upon any other business that may properly be brought before the meeting and at all adjournments and postponements thereof. If you are mailed or otherwise receive or obtain a proxy card, and you choose to vote by telephone or by Internet, you do not have to return your proxy card.

In Person at the Meeting. If you attend the meeting, be sure to bring a form of personal picture identification with you, and you may deliver your completed proxy card in person, or you may vote by completing a ballot, which will be available at the meeting.

Telephone and Internet voting for stockholders of record will be available until 11:59 p.m. EDT the day before the Annual Meeting, and mailed proxy cards must be received by the day before the Annual Meeting to be counted. If the Annual Meeting is adjourned or postponed, these deadlines may be extended.

If your shares of common stock are held in street name (held for your account by a broker or other nominee), you may vote:

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

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

In Person at the Meeting. If you attend the meeting, in addition to picture identification you should bring both an account statement or a letter from the record holder indicating that you owned the shares as of the record date, and contact the broker or other nominee who holds your shares to obtain a broker's proxy card and bring it with you to the meeting.

What are the Board's recommendations on how to vote my shares?

The Board recommends a vote:

Proposal 1: FOR the election of the three Class III directors

Proposal 2: FOR the advisory resolution approving the compensation of the Company's named executive officers

Proposal 3: FOR the ratification of the selection of KPMG LLP as the Company's independent registered public accounting firm

Who pays the cost for soliciting proxies?

The Company will pay the cost for the solicitation of proxies by the Board.

The solicitation of proxies will be made primarily by mail and through Internet access to materials. Proxies also may be solicited personally, by telephone, fax or e-mail by employees of the Company without any remuneration to such individuals other than their regular compensation. The Company also will reimburse brokers, banks, custodians, other nominees and fiduciaries for forwarding these materials to their principals to obtain the authorization for the execution of proxies.

How are proxies voted?

All shares represented by valid proxies received prior to the applicable deadlines will be voted and, where a stockholder specifies by means of the proxy a choice with respect to any matter to be acted upon, the shares will be voted in accordance with the stockholder's instructions. However, if no choice is specified on a proxy as to one or more of the proposals, the proxy will be voted in accordance with the Board's recommendations on such proposals as set forth in this proxy statement.

Can I change my vote?

After you have submitted your proxy, you may still change your vote and revoke your proxy prior to the Annual Meeting by taking any one of the following actions:

- submitting a new proxy by following the “Vote by Internet” or “Vote by Phone” instructions on the enclosed proxy card up until 11:59 p.m., EDT, the day before the Annual Meeting;
- signing another proxy card and either arranging for delivery of that proxy card by mail prior to the start of the Annual Meeting or by delivering that signed proxy card in person at the Annual Meeting;
- giving our Secretary a written notice before or at the Annual Meeting that you want to revoke your proxy; or
- voting in person at the Annual Meeting.

Your attendance at the Annual Meeting alone will not revoke your proxy. If the shares you own are held in “street name” by a bank, broker or other nominee record holder, which we collectively refer to in this proxy statement as “brokerage firms”, your brokerage firm, as the record holder of your shares, is required to vote your shares according to your instructions.

Could other matters be decided at the Annual Meeting?

The Company does not know of any other matters that may be presented for action at the Annual Meeting. Should any other business come before the meeting, the persons named on the enclosed proxy will have discretionary authority to vote the shares represented by such proxies in accordance with their best judgment. If you hold shares through a broker, bank or other nominee as described above, they will not be able to vote your shares on any other business that comes before the Annual Meeting unless they receive instructions from you with respect to such matter.

What happens if the meeting is postponed or adjourned?

Your proxy may be voted at the postponed or adjourned meeting. You will still be able to change your proxy as outlined above under “Can I change my vote?”.

How can I find out the results of the voting at the Annual Meeting?

Preliminary voting results will be announced at the Annual Meeting. Final voting results will be published in a Current Report on Form 8-K, or Form 8-K, that we will file with the SEC within four business days after the Annual Meeting.

What does it mean if I receive more than one proxy card or voting instruction form?

It means that you have multiple accounts at the transfer agent or with brokers. Please complete and return all proxy cards or voting instruction forms to ensure that all of your shares are voted.

Who should I call if I have any additional questions?

If you hold your shares directly, please call Joseph W. La Barge, Secretary of the Company, at (855) 772-7589. If your shares are held in street name, please call the telephone number provided on your voting instruction form or contact your broker or nominee holder directly.

VOTES REQUIRED

How is a quorum reached?

The presence, in person or by proxy, of holders of at least a majority of the total number of outstanding shares entitled to vote is necessary to constitute a quorum for the transaction of business at the Annual Meeting. Shares held of record by stockholders or brokers, banks or other nominees who do not return a signed and dated proxy or attend the Annual Meeting in person will not be considered present or represented at the Annual Meeting and will not be counted in determining the presence of a quorum. Abstentions and “broker non-votes”, if any, will be counted for purposes of determining whether a quorum is present for the transaction of business at the meeting. Broker non-votes occur when your broker or other nominee submits a proxy for your shares (because the broker or nominee has received instructions from you on one or more proposals, but not all, or has not received instructions from you but is entitled to vote on a particular “discretionary” matter) but does not indicate a vote for a particular proposal because the broker or other nominee does not have the authority to vote on that proposal and has not received voting instructions from you or has discretionary authority but chooses not to exercise it. If a quorum is not present, the meeting may be adjourned until a quorum is obtained.

How is the vote counted?

Votes cast by proxy or in person at the Annual Meeting will be counted by the persons appointed by Spark to act as tabulators for the meeting. The tabulators will count all votes “FOR”, “AGAINST” or to “WITHHOLD”, as well as abstentions and broker non-votes, as applicable, for each matter to be voted on at the Annual Meeting. Shares represented by proxies that withhold authority to vote for a nominee for election as a director will not be counted as votes “for” a director. Shares properly voted to “abstain” on a particular matter and broker non-votes are treated as having not voted on the particular matter and will therefore not affect the outcome of the proposals below.

Under the rules that govern brokers holding shares for their customers, brokers who do not receive voting instructions from their customers have the discretion to vote uninstructed shares on routine matters, but do not have discretion to vote such uninstructed shares on non-routine matters. Only Proposal 3, the ratification of the selection of KPMG LLP, is considered a routine matter where brokers are permitted to vote shares held by them without instruction. If your shares are held through a broker, those shares will not be voted in the election of directors unless you affirmatively provide the broker instructions on how to vote.

What vote is required to approve each item?

Votes cast by proxy or in person at the Annual Meeting will be counted by the persons appointed by the Company to act as tabulators for the meeting. The tabulators will count all votes “FOR”, “AGAINST” and to “WITHHOLD” abstentions and broker non-votes, as applicable, for each matter to be voted on at the Annual Meeting. Abstentions and broker non-votes are not counted as votes cast and, therefore, do not have the effect of votes in opposition to such proposals. A broker non-vote occurs when a nominee holding shares for a beneficial owner does not vote on a particular proposal because the nominee does not have discretionary voting power with respect to that item and has not received instructions from a the beneficial owner.

Proposal 1 - Election of three Class III director nominees

The three nominees for election as Class III directors who receive the highest number of the votes cast (called a plurality) for election of directors shall be elected directors. Proposal 1 is a non-routine matter.

Proposal 2 - Advisory vote on executive compensation

To approve the advisory vote on the compensation of our named executive officers, a majority of the votes cast must vote FOR the proposal. Shares that abstain and broker non-votes will not be counted as votes in favor of this proposal and also will not be counted as votes cast. Only FOR and AGAINST votes will affect the outcome. Accordingly, abstentions and broker non-votes will have no effect on the voting of Proposal 2. Proposal 2 is non-binding. Because the vote is advisory and non-binding on us or our Board in any way, our Board may decide that it is in our stockholders' best interests to compensate our named executive officers in an amount and in a manner that differs from that which is approved by our stockholders. Proposal 2 is a non-routine matter.

Proposal 3 - Ratification of selection of KPMG LLP as our independent registered public accounting firm

To approve Proposal 3, holders of a majority of votes cast must vote FOR the ratification of the selection of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2018. Proposal 3 is a routine matter.

PROPOSAL 1: ELECTION OF CLASS III DIRECTORS

In accordance with Delaware law and the Company's Restated Certificate of Incorporation and Amended and Restated By-laws, the Board is divided into three classes of approximately equal size, with members of each class serving staggered three year terms. Jeffrey D. Marrazzo, Vincent J. Milano and Elliott Sigal, M.D., Ph.D., are the directors whose terms expire at this Annual Meeting and each of Messrs. Marrazzo and Milano and Dr. Sigal has been nominated for and has agreed to stand for re-election to the Board to serve as a Class III director of the Company. Pursuant to the By-laws, the Board has fixed the number of directors at nine (9) as of the date of the Annual Meeting. It is intended that, unless you give contrary instructions, shares represented by proxies solicited by the Board will be voted for the election of the three nominees listed below as director nominees. The vote of a plurality of the votes cast at the meeting will be required for the election of the Class III director nominees. Broker non-votes and votes withheld will not be treated as votes cast for this purpose and, therefore, will not affect the outcome of the election. The Company has no reason to believe that any nominee will be unavailable for election at the Annual Meeting. In the event that one or more nominees is unexpectedly not available to serve, proxies may be voted for another person nominated as a substitute by the Board, or the Board may reduce the number of directors to be elected at the Annual Meeting. Information relating to each nominee for election as director and for each continuing director, including his or her period of service as a director of the Company, principal occupation and other biographical material is shown under the heading "Director Biographies".

**THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE
FOR
EACH OF THESE NOMINEES FOR CLASS III DIRECTOR
(PROPOSAL 1 ON YOUR PROXY CARD)**

Jeffrey D. Marrazzo
Vincent J. Milano
Elliott Sigal, M.D., Ph.D.

HOW OUR BOARD IS ORGANIZED

Composition of the Board of Directors

Our Board currently is authorized to have nine members and is divided into three classes, Class I, Class II and Class III, with members of each class serving staggered three-year terms. The members of the classes are as follows:

the Class I directors are Dr. Mehra, Mr. Perez and Ms. Zoth and their terms expire at the annual meeting of stockholders to be held in 2019;

the Class II directors are Drs. Altschuler, Ekman and High and their terms expire at the annual meeting of stockholders to be held in 2020; and

the Class III directors are Messrs. Marrazzo and Milano and Dr. Sigal and their terms expire at the 2018 Annual Meeting.

Upon the expiration of the term of a class of directors, directors in that class are eligible to be elected for a new three-year term at the annual meeting of stockholders in the year in which their term expires. In accordance with the terms of our Restated Certificate of Incorporation and Amended and Restated By-laws, our directors may be removed only for cause by the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors.

DIRECTOR BIOGRAPHIES

The following table sets forth information concerning each member of our Board as of April 9, 2018. The biographical description of each director includes the specific experience, qualifications, attributes and skills that the Board would expect to consider if it were making a conclusion currently as to whether such person should serve as a director. In addition to the specific qualifications enumerated in their biographies, we believe that each of our directors possesses the attributes and characteristics described below under the heading “Board Processes - Minimum qualifications”.

NAME	Age	Position
Jeffrey D. Marrazzo	39	Chief Executive Officer and Director
Katherine A. High, M.D.	66	President, Head of Research and Development and Director
Steven M. Altschuler, M.D. (1) (2) (3)	64	Chairman of the Board
Lars G. Ekman, M.D., Ph.D. (1) (3) (4)	68	Director
Anand Mehra, M.D. (4)	42	Director
Vincent J. Milano (2)	54	Director
Robert J. Perez (2) (3)	53	Director
Elliott Sigal, M.D., Ph.D. (3) (4)	66	Director
Lota Zoth, CPA (1) (2)	58	Director

(1) Member of the Audit Committee.

(2) Member of the Compensation Committee.

(3) Member of the Nominating and Corporate Governance Committee.

(4) Member of the Science and Technology Committee.

Jeffrey D. Marrazzo

Jeffrey D. Marrazzo has served as Chief Executive Officer of the Company and as a member of our Board since May 2013. Prior to founding Spark, Mr. Marrazzo launched and was Chief Business Officer of the U.S. division of Molecular Health, Inc. from December 2011 to May 2013. Mr. Marrazzo was part of the founding management of Generation Health, Inc. from May 2009 to January 2011, up to and through the acquisition of a majority of the company’s shares by CVS Caremark. From 2008 to 2009, Mr. Marrazzo served as an employee and independent consultant to the business development and finance teams at Tengion Inc. and, from January 2011 to April 2013, Mr. Marrazzo served as an independent consultant to the Children's Hospital of Philadelphia, or CHOP. Previously, Mr. Marrazzo served as healthcare advisor to former Pennsylvania Governor Edward G. Rendell and as an IBM management consultant to global pharmaceutical companies. Mr. Marrazzo holds a B.S.E. and B.A. in systems

science and engineering and economics from the University of Pennsylvania and a dual M.B.A./M.P.A. from The Wharton School and Harvard University. We believe that Mr. Marrazzo is qualified to serve on our Board because of his extensive leadership experience in the life sciences industry and his extensive knowledge of our Company based on his role as Chief Executive Officer.

Katherine A. High, M.D.

Dr. Katherine A. High has served as our President and a member of our Board since September 2014 and has served as our Head of Research and Development since September 2017. From September 2014 through September 2017, Dr. High served as our Chief Scientific Officer. Prior to serving as our President, Dr. High provided advice to Spark and subsequently served as an independent consultant to Spark from December 2013 to September 2014. From July 1999 through September 2014, Dr. High was a Professor at the Perelman School of Medicine at the University of Pennsylvania. From March 2003 through September 2014, Dr. High was an Investigator of the Howard Hughes Medical Institute. She served as the Director of the Center for Cellular and Molecular Therapeutics at CHOP from September 2004 to April 2014. Dr. High began her independent research career at Yale University and the University of North Carolina studying the molecular basis of blood coagulation and the development of novel therapeutics for the treatment of bleeding disorders. Dr. High's studies at CHOP established the first proof of principle of gene therapy for hemophilia in preclinical models and led to a series of studies that characterized the human immune response to adeno-associated virus, or AAV, vectors in a variety of target tissues. Dr. High served a five-year term, from 2000 to 2005, on the the U.S. Food and Drug Administration Advisory Committee on Cell, Tissue and Gene Therapies and is a past-president of the American Society of Gene & Cell Therapy. Dr. High holds an A.B. in chemistry from Harvard University, an M.D. from the University of North Carolina School of Medicine, a business certification from the University of North Carolina Business School Management Institute for Hospital Administrators and an honorary M.A. from the University of Pennsylvania. We believe that Dr. High is qualified to serve on our Board because of her extensive executive and scientific leadership in the life sciences industry and her extensive knowledge of our Company based on her role as President and Head of Research and Development and her previous role as Chief Scientific Officer.

Non-Employee Directors

Steven M. Altschuler, M.D.

Dr. Steven M. Altschuler has served on our Board and has been the Chairman of our Board since October 2013. Dr. Altschuler has been serving as an Academic Healthcare Consultant working with multiple health systems since October 2017. He served as the Executive Vice President of Health Affairs at the University of Miami and Chief Executive Officer of UHealth-University of Miami Health System from January 2016 to October 2017. Previously, he was Chief Executive Officer of CHOP and The Children's Hospital of Philadelphia Foundation, or the CHOP Foundation, from April 2000 to November 2015. Prior to serving as the Chief Executive Officer of CHOP, Dr. Altschuler served in many leadership roles at CHOP including: Division Chief of Gastroenterology, Physician-in-Chief, inaugural holder of the Leonard and Madlyn Abramson Endowed Chair in Pediatrics and Professor and Chair of the Department of Pediatrics at the Perelman School of Medicine at the University of Pennsylvania, where he was a faculty member from 1985 to 2000. Dr. Altschuler served on the board of directors for Mead Johnson Nutrition Company from 2009 through 2017. Dr. Altschuler currently is chair of the Compensation and Audit Committees and has served on the board of directors of Weight Watchers International since 2012. Dr. Altschuler holds a B.A. in mathematics and an M.D., both from Case Western Reserve University. He completed his pediatric internship and residency at Children's Hospital Medical Center-Boston and fellowship training in gastroenterology and nutrition at CHOP and the University of Pennsylvania School of Medicine. We believe that Dr. Altschuler is qualified to serve on our Board because of his extensive experience in the medical industry, his service on the boards of directors of other life sciences companies and his extensive leadership experience.

Lars G. Ekman, M.D., Ph.D.

Dr. Lars G. Ekman has served on our Board since May 2014. He currently is Executive Partner at Sofinnova Ventures which he joined in March 2008. Prior to joining Sofinnova Ventures, Dr. Ekman was President of Research and Development at Elan Corporation (now Perrigo) from January 2001 to December 2007. Prior to Elan, he was Executive Vice President, Research and Development, at Schwarz Pharma AG (now UCB) and, prior to then, held a variety of senior scientific and clinical roles at Pharmacia (now Pfizer). Dr. Ekman has served as a director of Amarin Corporation since 2008, Prothena Biosciences Inc. since 2012, Sophiris Bio Inc. since 2010, Ultragenyx Pharmaceutical Inc. since 2016 and he co-founded and served as Chief Executive Officer of Cebix, Inc. from 2008 to 2011, and served on its board from 2009 to 2015. Dr. Ekman is a board-certified surgeon and holds an M.D. and a

Ph.D. in experimental biology from the University of Gothenburg, Sweden. We believe that Dr. Ekman is qualified to serve on our Board because of his extensive experience in the life sciences industry, both as an executive and as a venture capital investor, in addition to his extensive leadership experience.

Anand Mehra, M.D.

Dr. Anand Mehra has served on our Board since May 2014. Dr. Mehra currently is a General Partner of Sofinnova Ventures, which he joined in May 2007. Prior to joining Sofinnova Ventures, Dr. Mehra worked in J.P. Morgan's private equity and venture capital group and, before that, Dr. Mehra was a consultant in McKinsey & Company's pharmaceutical practice. Dr. Mehra previously has served on the board of directors of Aerie Pharmaceuticals and Marinus Pharmaceuticals. He currently

serves on the board of Aclaris Therapeutics, Inc. and Merus N.V., positions he has held since 2013 and 2015, respectively, as well as several private companies. Dr. Mehra holds a B.A. from the University of Virginia and an M.D. from Columbia University's College of Physicians and Surgeons. We believe that Dr. Mehra is qualified to serve on our Board because of his extensive experience in the life sciences industry, his service on the boards of directors of other life sciences companies and his extensive leadership experience.

Vincent J. Milano

Vincent J. Milano has served on our Board since June 2014. Mr. Milano has served as the Chief Executive Officer of Idera Pharmaceuticals Inc. since December 2014. Prior to joining Idera, Mr. Milano served as President, Chief Executive Officer and Chairman of the board of directors of ViroPharma Incorporated, or ViroPharma, from March 2008 to January 2014 when it was acquired by Shire Pharmaceuticals, Inc. Mr. Milano joined ViroPharma in 1996 and served as Vice President, Chief Financial Officer and Treasurer from 1997 to 2008. Prior to joining ViroPharma, Mr. Milano served as a Senior Manager at KPMG LLP, independent certified public accountants. Mr. Milano has served on the board of directors of Vanda Pharmaceuticals Inc. since 2010 and the board of directors of VenatoRx Pharmaceuticals, Inc., a privately held biotechnology company, since 2013. He also serves on the board of directors of Life Sciences Pennsylvania. Mr. Milano holds a B.S. in accounting from Rider College. We believe that Mr. Milano is qualified to serve on our Board because of his extensive experience in the life sciences industry, his financial expertise and his extensive leadership experience.

Robert J. Perez

Robert J. Perez has served on our Board since January 2018. Mr. Perez has served as the founder and Managing Partner of Vineyard Sound Advisors, a biopharmaceutical advisory firm since August 2015. He served as Chief Executive Officer of Cubist Pharmaceuticals, Inc., a public pharmaceutical development company, from December 2014 until it was acquired by Merck in January 2015. He joined Cubist in August 2003 as Senior Vice President, Sales and Marketing, and led the launch of Cubicin® (daptomycin for injection). He served as Executive Vice President and Chief Operating Officer from August 2007 to July 2012 and President and Chief Operating Officer from July 2012 to December 2014. Prior to joining Cubist, he served as Vice President of Biogen, Inc.'s CNS business unit from 2001 to 2003, where he was responsible for commercial leadership of an \$800 million neurology business unit, and from 1995 to 2001 he held positions of increasing responsibility within Biogen's CNS commercial organization. Mr. Perez currently serves as a member of the board of directors of AMAG Pharmaceuticals, Inc., Cidara Therapeutics, Inc., Zafgen, Inc. and Unum Therapeutics Inc., positions he has held since 2009, 2015, 2015 and 2018, respectively. Mr. Perez has been the Founder and Chairman of Life Sciences Cares since January 2016, and also has been a member of the Board of Trustees at The Dana Farber Cancer Institute, Inc. since January 2013. Mr. Perez received a B.S. in business from California State University, Los Angeles and an M.B.A. from the Anderson Graduate School of Management at the University of California, Los Angeles. We believe Mr. Perez is qualified to serve on our Board because of his extensive biotechnical and leadership experience, including his service at Cubist Pharmaceuticals, Inc. and Biogen, Inc.

Elliott Sigal, M.D., Ph.D.

Dr. Elliott Sigal has served on our Board since January 2014. Dr. Sigal served as Chief Scientific Officer of Bristol-Myers Squibb, or BMS, from October 2004 until his retirement in June 2013 and was a member of the board of directors from March 2011 to June 2013. Dr. Sigal joined BMS in 1997 and held positions of increasing responsibility in drug discovery and development and was a member of the executive committee from September 2001 through June 2013. Prior to BMS, he was Vice President of R&D and Chief Executive Officer for the genomics firm Mercator Genetics Inc. Dr. Sigal currently serves as a member of the board of directors for Adaptimmune Therapeutics plc, a role he has held since 2014. In addition, Dr. Sigal is an advisor to the life sciences venture firm New Enterprise Associates and consults for select biopharmaceutical companies. Dr. Sigal holds B.S., M.S. and Ph.D. degrees in industrial engineering from Purdue University and an M.D. from the University of Chicago. He completed his training in internal medicine and pulmonary medicine at the University of California, San Francisco, or UCSF. He received his research training at the Cardiovascular Research Institute at UCSF, where he served on the faculty of the UCSF Department of Medicine. We believe that Dr. Sigal is qualified to serve on our Board because of his extensive experience in the life sciences industry and his extensive leadership experience.

Lota Zoth, CPA

Lota Zoth has served on our Board since January 2016. Ms. Zoth has served in senior financial roles in a variety of commercial-stage companies over a 30-year career, including serving as Chief Financial Officer of MedImmune Inc., or Medimmune, from 2002 until its acquisition by AstraZeneca in 2007. Prior to joining MedImmune in 2002, Ms. Zoth served as Senior Vice President, Corporate Controller and Principal Accounting Officer at PSINet Inc., Vice President, Corporate Controller and Chief Accounting Officer at Sodexo Marriott Services, Inc., Marriott International and PepsiCo, Inc. Ms. Zoth also served as an auditor at Ernst & Young, LLP and is a Certified Public Accountant. Ms. Zoth received a B.B.A. in

accounting from Texas Tech University. She currently serves on the board of Orexigen Therapeutics, Inc., Circassia Pharmaceuticals, PLC, NewLink Genetics Corporation and Zymworks, roles she has held since 2012, 2015, 2012 and 2017, respectively. Orexigen Therapeutics, Inc. filed a petition for relief under Chapter 11 of the U.S. Bankruptcy Code on March 12, 2018. We believe that Ms. Zoth is qualified to serve on our Board because of her extensive experience in the life sciences industry, her financial expertise and extensive leadership experience.

DIRECTOR INDEPENDENCE

Rule 5605 of the NASDAQ Listing Rules requires a majority of a listed company's board of directors to be comprised of independent directors within one year of listing. In addition, the NASDAQ Listing Rules require that, subject to specified exceptions, each member of a listed company's audit, compensation and nominating and corporate governance committees be independent and that audit committee members also satisfy independence criteria set forth in Rule 10A-3 under the Securities Exchange Act of 1934, as amended, or the Exchange Act.

Under Rule 5605(a)(2) of the NASDAQ Listing Rules, a director will only qualify as an "independent director" if, in the opinion of our Board, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In order to be considered independent for purposes of Rule 10A-3, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors or any other board committee: (1) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries; or (2) be an affiliated person of the listed company or any of its subsidiaries. In addition, in affirmatively determining the independence of any director who will serve on a company's compensation committee, Rule 10C-1 under the Exchange Act requires that a company's board of directors consider all factors specifically relevant to determining whether a director has a relationship to such company which is material to that director's ability to be independent from management in connection with the duties of a compensation committee member, including, but not limited to: (1) the source of compensation of the director, including any consulting, advisory or other compensatory fee paid by such company to the director; and (2) whether the director is affiliated with the company or any of its subsidiaries or affiliates.

In February 2018, our Board undertook a review of the composition of our Board and its committees and the independence of each director. Based upon information requested from, and provided by, each director concerning his or her background, employment and affiliations, including family relationships, our Board has determined that each of our directors, with the exception of Mr. Marrazzo and Dr. High, is an "independent director" as defined under Rule 5605(a)(2) of the NASDAQ Listing Rules. Our Board also determined that Ms. Zoth and Drs. Altschuler and Ekman, who comprise our Audit Committee, Messrs. Milano and Perez and Dr. Altschuler and Ms. Zoth, who comprise our Compensation Committee, and Drs. Ekman, Altschuler and Sigal and Mr. Perez, who comprise our Nominating and Corporate Governance Committee, satisfy the independence standards for such committees established by the SEC and the NASDAQ Listing Rules, as applicable. In making such determinations, our Board considered the relationships that each such non-employee director has with our Company and all other facts and circumstances our Board deemed relevant in determining independence, including the beneficial ownership of our capital stock by each non-employee director.

There are no family relationships among any of our directors or executive officers.

BOARD COMMITTEES

Our Board has established four standing committees: Audit, Compensation, Nominating and Corporate Governance and Science and Technology, each of which operates under a charter that has been approved by our Board. Each such charter is available on the Investor Relations section of our website at www.sparktx.com.

Audit Committee

The members of our Audit Committee are Ms. Zoth and Drs. Altschuler and Ekman. Ms. Zoth is the chair of the Audit Committee. During the fiscal year ended December 31, 2017, the Audit Committee met five times. The report of the Audit Committee is included in this Proxy Statement under the heading "Audit Committee Report". 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 reports from such firm;
- reviewing and discussing with management and the 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, including the Company compliance hotline;
- assessing our risk management policies;
- establishing policies regarding hiring employees from the independent registered public accounting firm;
- procedures for the receipt and retention of accounting related complaints and concerns;
- meeting independently with our independent registered public accounting firm, management and internal auditing staff, if any;
- reviewing and approving or ratifying any related-person transactions; and
- preparing the Audit Committee report required by SEC rules.

All audit and non-audit services to be provided to us by our independent registered public accounting firm must be approved in advance by our Audit Committee.

Our Board has determined that Ms. Zoth is an “audit committee financial expert” as defined by applicable SEC rules. We believe that the composition of our Audit Committee meets the requirements for independence under the current NASDAQ Listing Rules and SEC rules and regulations.

Compensation Committee

The members of our Compensation Committee are Messrs. Milano and Perez, Dr. Altschuler and Ms. Zoth. Mr. Milano is the chair of the Compensation Committee. During the fiscal year ended December 31, 2017, the Compensation Committee met five times. Our Compensation Committee’s responsibilities include:

- annually reviewing and approving corporate goals and objectives relevant to compensation for the Chief Executive Officer and our other executive officers;
- determining our Chief Executive Officer's compensation as well as the compensation of our other executive officers;
- overseeing an evaluation of our senior executives;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our Board with respect to director compensation;
- reviewing and discussing annually with management our “Compensation Discussion and Analysis”; and
- preparing the annual Compensation Committee report required by SEC rules.

Our executive compensation program is administered by the Compensation Committee of our Board, subject to the oversight and approval of our full Board. Our Compensation Committee reviews our executive compensation practices on an annual basis and based on this review approves or, as appropriate, makes recommendations to our Board for approval of our executive compensation program. Our Chief Executive Officer recommends annual executive salary increases, annual equity awards and bonuses, if any, for the other executive officers, which are then reviewed and approved or adjusted by the Compensation Committee.

In designing our executive compensation program, our Compensation Committee considers publicly available compensation data for national and regional companies in the biotechnology/pharmaceutical industry to help guide its executive compensation decisions at the time of hiring and for subsequent adjustments in compensation. In 2017, our Compensation Committee engaged Willis Towers Watson as its independent compensation consultant to provide comparative data on executive compensation practices in our industry and to advise on our executive compensation program generally. The Compensation Committee also engaged Willis Towers Watson for recommendations and review of non-employee director compensation in 2018. Although our Compensation Committee considers the advice and recommendations of Willis Towers Watson as to our executive compensation program, our Compensation Committee ultimately makes their own decisions about these matters. In the future, we expect that our Compensation Committee will continue to engage independent compensation consultants to provide additional guidance on our executive compensation programs and to conduct further competitive benchmarking against a peer group of publicly traded companies.

In April 2017, the Compensation Committee reviewed information regarding the independence and potential conflicts of interest of Willis Towers Watson, taking into account, among other things, the factors set forth in the NASDAQ listing standards. Based on such review, the committee concluded that the engagement of Willis Towers Watson did not raise any conflict of interest.

Our director compensation program is administered by our Board with the assistance of the Compensation Committee. The Compensation Committee conducts an annual review of director compensation and makes recommendations to the Board with respect thereto.

Nominating and Corporate Governance Committee

The members of our Nominating and Corporate Governance Committee are Drs. Ekman, Altschuler and Sigal and Mr. Perez. Dr. Ekman is the chair of the Nominating and Corporate Governance Committee. During the fiscal year ended December 31, 2017, the Nominating and Corporate Governance Committee met four times. Our Nominating and Corporate Governance Committee's responsibilities include:

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

Science and Technology Committee

The members of our Science and Technology Committee are Drs. Sigal, Ekman and Mehra. Dr. Sigal is the chair of the Science and Technology Committee. During the fiscal year ended December 31, 2017, the Science and Technology Committee met one time. Our Science and Technology Committee's responsibilities include:

- reviewing, evaluating and advising our Board and management regarding the long-term strategic goals and objectives and the quality and direction of our research and development programs;
- monitoring and evaluating trends in research and development, and recommending to our Board and management emerging technologies for building our technological strength;
 - recommending approaches to acquiring and maintaining technology positions;
- advising our Board and management on the scientific aspects of business development transactions; and
- regularly reviewing our research and development pipeline.

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

Mr. Milano and Drs. Altschuler and Sigal served as members of the Compensation Committee during the year ended December 31, 2017. None of our executive officers serves as a director or a member of a Compensation Committee (or other committee serving an equivalent function) of any other entity that has one or more of its executive officers serving as a director or member of our Compensation Committee. None of the members of our current Compensation Committee or our Compensation Committee for the year ended December 31, 2017, is, or has ever been, an officer or employee of our Company.

BOARD MEETINGS AND ATTENDANCE

Our Board held five meetings during the fiscal year ended December 31, 2017. Each of the directors attended at least 75% of the meetings of the Board and the committees of the Board on which he or she served during the fiscal year ended December 31, 2017 (in each case, which were held during the period for which he or she was a director and/or a member of the applicable committee). The Company encourages its directors to attend the Annual Meeting of Stockholders. All members of the Board, other than Mr. Betz, who resigned from our Board in June 2017, attended the Company's 2017 Annual Meeting of Stockholders.

As required under applicable NASDAQ listing standards, the Company's independent directors met at least twice in regularly scheduled executive sessions at which only independent directors are present in the fiscal year ended December 31, 2017.

BOARD PROCESSES

Identifying and evaluating director nominees

Our Nominating and Corporate Governance Committee focuses on board composition and succession planning on a continuous basis, with the expectation that other members of the Board, and of management, will be requested to take part in the process as appropriate. The Nominating and Corporate Governance Committee recruits and recommends nominees for election to the full Board, with the goal of creating a well-rounded Board that is able to provide effective

oversight through an appropriate balance of skill sets, perspectives, diversity of experience, and other qualifications. Generally, our Nominating and Corporate Governance Committee identifies candidates for director nominees in consultation with management, through the use of search firms or other advisors, through the recommendations submitted by stockholders or through such other methods as the Nominating and Corporate Governance Committee deems to be helpful to identify candidates. Once candidates have been identified, our Nominating and Corporate Governance Committee confirms that the

candidates meet all of the minimum qualifications for director nominees established by the Nominating and Corporate Governance Committee. The Nominating and Corporate Governance Committee may gather information about the candidates through interviews, detailed questionnaires, background checks or any other means that the Nominating and Corporate Governance Committee deems to be appropriate in the evaluation process. The Nominating and Corporate Governance Committee then meets to discuss and evaluate the qualities and skills of each candidate, both on an individual basis and taking into account the overall composition and needs of our Board. Based on the results of the evaluation process, the Nominating and Corporate Governance Committee recommends candidates for the Board's approval as director nominees for election to the Board.

Minimum qualifications

Our Nominating and Corporate Governance Committee will consider, among other things, the following qualifications, skills and attributes when recommending candidates for the Board's selection as nominees for the Board and as candidates for appointment to the Board's committees. As basic qualifications, nominees for the Board must:

• Adhere to the highest standards of personal and professional integrity;

• Demonstrate exceptional ability and judgment; and

• Effectively serve, in conjunction with the other nominees to the Board, the long-term interests of the stockholders.

In evaluating proposed director candidates, our Nominating and Corporate Governance Committee may consider, in addition to the minimum qualifications and other criteria for Board membership approved by the Board from time to time, all facts and circumstances that it deems appropriate or advisable, including, among other things, diversity (including, but not limited to race, gender or national origin), the skills of the proposed director candidate, his or her depth and breadth of professional experience or other background characteristics, his or her independence and the needs of the Board. We have no formal policy regarding Board diversity, however we give consideration to diversity when evaluating potential new directors. Our Nominating and Corporate Governance Committee's priority in selecting Board members is identification of persons who will further the interests of our Company through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among Board members, and professional and personal experiences and expertise relevant to our growth strategy. The Nominating and Corporate Governance Committee will consider candidates recommended by stockholders. The policy adopted by the Nominating and Corporate Governance Committee provides that candidates recommended by stockholders are given appropriate consideration in the same manner as other candidates.

Board leadership and the role in risk oversight

Our Board currently is chaired by Dr. Altschuler. As a general policy, our Board believes that separation of the positions of Chief Executive Officer and chairman reinforces the independence of the Board from management, creates an environment that encourages objective oversight of management's performance and enhances the effectiveness of the Board as a whole. As such, Mr. Marrazzo serves as our Chief Executive Officer while Dr. Altschuler serves as our Chairman of the Board but is not an officer.

Our Board oversees the management of risks inherent in the operation of our business and the implementation of our business strategies. Our Board performs this oversight role by using several different levels of review. In connection with its reviews of the operations and corporate functions of the Company, our Board addresses the primary risks associated with those operations and corporate functions. In addition, our Board reviews the risks associated with the Company's business strategies periodically throughout the year as part of its consideration of undertaking any such business strategies.

Each committee of our Board also oversees the management of the Company's risk that falls within the committee's areas of responsibility. In performing this function, each committee has full access to management, as well as the ability to engage advisors. Our Chief Legal Officer, principal accounting officer and head of corporate compliance all periodically provide reports to the Audit Committee and are responsible for identifying, evaluating and implementing risk management controls and methodologies to address any identified risks. In connection with its risk management role, our Audit Committee meets privately with representatives from our independent registered public accounting firm. The Audit Committee oversees the operation of our risk management program, including the identification of the primary risks associated with our business and periodic updates to such risks, and reports to our Board regarding these activities.

Executive session

The Board generally meets in executive session at every regularly scheduled Board meeting. These sessions are led by our independent Chairman, and involve various topics including executive officer performance and compensation, among other issues.

12

Communication with stockholders

Our Board values stockholder feedback, and will give appropriate attention to written communications that are submitted by stockholders, and will respond if and as appropriate. Information regarding how to contact our Board is available on the Investor Relations section of our website at www.sparktx.com.

POLICIES AND PROCEDURES FOR RELATED-PERSON TRANSACTIONS

On December 29, 2014, our Board adopted written policies and procedures for the review of any transaction, arrangement or relationship in which we are a participant, the amount involved exceeds \$120,000 and one of our executive officers, directors, director nominees or 5% stockholders (or their immediate family members), each of which we refer to as a “related person,” has a direct or indirect material interest.

If a related person proposes to enter into such a transaction, arrangement or relationship, which we refer to as a “related-person transaction,” the related person must report the proposed related-person transaction to our Chief Legal Officer. The policy calls for the proposed related-person transaction to be reviewed and, if deemed appropriate, approved by the Audit Committee of our Board. Whenever practicable, the reporting, review and approval will occur prior to entry into the transaction. If advance review and approval is not practicable, the committee will review and, in its discretion, may ratify the related-person transaction. The policy also permits the chair of the Audit Committee to review and, if deemed appropriate, approve proposed related-person transactions that arise between committee meetings, subject to ratification by the committee at its next meeting. Any related-person transactions that are ongoing in nature will be reviewed annually.

A related-person transaction reviewed under the policy will be considered approved or ratified if it is authorized by the committee after full disclosure of the related person’s interest in the transaction. As appropriate for the circumstances, the committee will review and consider:

- the related person’s interest in the related-person transaction;
- the approximate dollar value of the amount involved in the related-person transaction;
- the approximate dollar value of the amount of the related person’s interest in the transaction without regard to the amount of any profit or loss;
- whether the transaction was undertaken in the ordinary course of our business;
- whether the terms of the transaction are no less favorable to us than terms that could have been reached with an unrelated third party;
- the purpose of, and the potential benefits to us of, the related-person transaction; and
- any other information regarding the related-person transaction or the related person in the context of the proposed transaction that would be material to investors in light of the circumstances of the particular transaction.

The Audit Committee may approve or ratify the transaction only if the Audit Committee determines that, under all of the circumstances, the transaction is not inconsistent with our best interests. The Audit Committee may impose any conditions on the related-person transaction that it deems appropriate.

In addition to the transactions that are excluded by the instructions to the SEC’s related-person transaction disclosure rule, our Board has determined that the following transactions do not create a material direct or indirect interest on behalf of related persons and, therefore, are not related-person transactions for purposes of this policy:

- interests arising solely from the related person’s position as an executive officer of another entity (whether or not the person is also a director of such entity) that is a participant in the transaction, where (a) the related person and all other related persons own in the aggregate less than a 10% equity interest in such entity; (b) the related person and his or her immediate family members are not involved in the negotiation of the terms of the transaction and do not receive any special benefits as a result of the transaction and; (c) the amount involved in the transaction equals less than the greater of \$200,000 or 5% of the annual gross revenues of the company receiving payment under the transaction; and
- a transaction that is specifically contemplated by provisions of our certificate of incorporation or bylaws.

The policy provides that transactions involving compensation of executive officers shall be reviewed and approved by the Compensation Committee in the manner specified in its charter.

STOCKHOLDER PROPOSALS

Deadlines for stockholder proposals and director nominations

Stockholders who wish to present proposals for inclusion in our proxy materials for the annual meeting of stockholders to be held in 2019, or the 2019 Annual Meeting, may do so by following the procedures prescribed in Rule 14a-8 under the Exchange Act and in our Bylaws. Our Secretary must receive stockholder proposals intended to be included in our proxy statement and form of proxy relating to our 2019 Annual Meeting made under Rule 14a-8 by December 21, 2018.

Under our current Bylaws, proposals of business and nominations for directors other than those to be included in our proxy materials following the procedures described in Rule 14a-8 may be made by stockholders entitled to vote at the meeting if notice is timely given and if the notice contains the information required by the Company's bylaws. To be timely, a notice with respect to the 2019 Annual Meeting must be delivered to our Secretary no earlier than January 30, 2019, and no later than March 1, 2019.

Any proposal of business or nomination should be mailed to: Joseph W. La Barge, Secretary, Spark Therapeutics, Inc. 3737 Market Street, Suite 1300, Philadelphia, PA 19104.

PROPOSAL 2: ADVISORY VOTE ON EXECUTIVE COMPENSATION

The Board is committed to excellence in governance. As part of that commitment, and as required by Section 14A(a)(1) of the Exchange Act, the Board is providing the stockholders with an opportunity to provide an advisory vote related to the compensation of the Company's named executive officers.

As described below under "Executive Officers and Director Compensation", we have developed a compensation policy that is designed to attract and retain key executives responsible for our success and motivate management to enhance long-term stockholder value. We believe our compensation policy strikes an appropriate balance between the implementation of responsible, measured compensation practices and the effective provision of incentives for our named executive officers to exert their best efforts for our success.

For the reasons discussed below, the Board unanimously recommends that stockholders vote in favor of the following resolution:

"RESOLVED, that the Company's stockholders hereby approve, on an advisory basis, the compensation of the named executive officers, as disclosed in the Company's proxy statement for the 2018 Annual Meeting of Stockholders pursuant to the compensation disclosure rules of the SEC, including the Compensation Discussion and Analysis, Summary Compensation Table and the other compensation related tables and disclosure."

As this vote is advisory, it will not be binding upon the Board or the Compensation Committee and neither the Board nor the Compensation Committee will be required to take any action as a result of the outcome of this vote. However, the Compensation Committee will carefully consider the outcome of this vote when considering future executive compensation policies.

**THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE
FOR**

**THE ADVISORY RESOLUTIONS APPROVING THE COMPANY'S EXECUTIVE COMPENSATION
(PROPOSAL 2 ON YOUR PROXY CARD)**

EXECUTIVE OFFICERS AND DIRECTOR COMPENSATION

Executive officers

The following table sets forth information regarding our executive officers, as of April 9, 2018:

NAME	Age	Position
Jeffrey D. Marrazzo	39	Chief Executive Officer
Katherine A. High, M.D.	66	President and Head of Research and Development
Stephen W. Webster	57	Chief Financial Officer
Lisa Dalton	45	Chief Human Resources Officer
Daniel R. Faga	38	Chief Business Officer
John P. Furey	53	Chief Operating Officer
Joseph W. La Barge	46	Chief Legal Officer
Federico Mingozi, Ph.D.	44	Chief Scientific Officer

Jeffrey D. Marrazzo. Mr. Marrazzo became our Chief Executive Officer and a director in May 2013. Please see Mr. Marrazzo's biographical information set forth in the Election of Directors section in this proxy statement.

Katherine A. High, M.D. Dr. High became our President, Chief Scientific Officer and a director in September 2014 and became our President and Head of Research and Development in September 2017. Please see Dr. High's biographical information set forth in the Election of Directors section in this proxy statement.

Stephen W. Webster. Mr. Webster has served as our Chief Financial Officer since July 2014. From June 2012 to November 2013, he served as Senior Vice President, Finance and Chief Financial Officer at Optimer Pharmaceuticals. From June 2008 to December 2011, Mr. Webster served as Senior Vice President, Finance and Chief Financial Officer at Adolor Corporation. Mr. Webster has served on the board of directors of Viking Therapeutics Inc. since June 2014 and on the board of directors of Nabriva Therapeutics AG since August 2016. Mr. Webster holds an A.B. in economics from Dartmouth College and an M.B.A. in finance from The Wharton School at the University of Pennsylvania.

Lisa Dalton. Ms. Dalton has served as our Chief Human Resources Officer since February 2018, prior to which she served as our Head of Human Resources since July 2014. Prior to joining the Company, Ms. Dalton served as a Vice President, Human Resources at Shire PLC from July 2004 through June 2014 where she led HR merger and acquisition activity and implementation, built and led the compensation function, implemented an HR systems platform and established the HR operations function. Ms. Dalton holds a B.A. in psychology from Pennsylvania State University and an M.B.A. from Rutgers University School of Business.

Daniel R. Faga. Mr. Faga has served as our Chief Business Officer since May 2016. From July 2009 until April 2016, Mr. Faga was a Managing Director at Centerview Partners, where he had served as a founding member of Centerview's healthcare advisory practice. Prior to Centerview, Mr. Faga worked at Merrill Lynch in its healthcare investment banking group and as a management consultant in the Life Sciences Practice at PRTM. Mr. Faga earned a B.S. in Engineering from Cornell University and an M.B.A. in Health Care Management from The Wharton School at the University of Pennsylvania.

John P. Furey. Mr. Furey has served as our Chief Operating Officer since December 2016. From October 2014 through August 2016, Mr. Furey was Senior Vice President and Head of Global Operations for Baxalta (now Shire PLC), or Baxalta, where he directed manufacturing, quality, engineering and process development. He led the team that coordinated and delivered the successful establishment of Baxalta through a spin out from Baxter International, Inc., or Baxter, and led the Baxter vaccine business to realize significant top-line and bottom-line growth. From March 2014 through September 2014, Mr. Furey served as Vice President and Program Management Office Lead, and from February 2013 until March 2014, Mr. Furey was a Vice President and Global Franchise Head, Vaccines Franchise for Baxter. Prior to Baxter, from April 2011 to January 2013 he served as General Manager in China of Pfizer Inc.'s, or Pfizer's, vaccine business unit following a role with responsibility for global pricing and reimbursement at Pfizer Vaccines. Earlier in his career, he held both commercial and operations positions of increasing scope and

responsibility with Pfizer and Wyeth Pharmaceuticals. Mr. Furey has an executive M.B.A. from St. Joseph's University, Philadelphia, a B.S. from Trinity College, Dublin, and a diploma in Environmental Health from the Dublin Institute of Technology.

Joseph W. La Barge. Mr. La Barge has served as our Chief Legal Officer since July 2017 and formerly served as our General Counsel from November 2013 to July 2017. Prior to joining the Company, Mr. La Barge was of counsel at Ballard Spahr LLP from April 2012 to April 2013, where he advised biotechnology companies in private and public financings, mergers and acquisitions and collaboration and licensing transactions. He also served as the Deputy General Counsel to the Kennedy Health System from April 2013 to November 2013. Mr. La Barge was the Vice President, General Counsel and Chief Compliance Officer at Tengion, Inc., in increasing roles of responsibility from November 2006 to December 2011, where he oversaw legal affairs, corporate compliance and quality assurance. Mr. La Barge serves on the board of directors of Life Sciences Pennsylvania and the National Pharmaceutical Council and also serves on the Government Affairs Committee of the American Society of Gene & Cell Therapy. Mr. La Barge holds a B.A. from Bucknell University and a J.D. from Temple University.

Federico Mingozzi, Ph.D. Dr. Mingozzi has served as our Chief Scientific Officer since September 2017. Prior to joining the Company, Dr. Mingozzi served as a Research Director at the French National Institute of Health and Medical Research from January 2016 until September 2017. From January 2013 to September 2017, Dr. Mingozzi served as the Head of the Immunology and Liver Gene Transfer Unit at Genethon, a leading French nonprofit research and development organization focused on gene therapy for rare diseases. From January 2013 to September 2017, Dr. Mingozzi served as faculty at the Pierre and Marie Curie University in Paris, France, and from September 2011 to September 2017 at the Universitat Autònoma de Barcelona, Spain. Dr. Mingozzi received his bachelor's degree in biology and his Ph.D. in biochemistry and molecular biology from the University of Ferrara in Italy, and his M.B.A. from Drexel University.

Compensation discussion and analysis

The Compensation Committee of our Board is responsible for establishing compensation policies with respect to our "named executive officers", which include our chief executive officer, chief financial officer and three other executive officers who are listed in the Summary Compensation table on page 28. Our named executive officers as of the end of our last completed fiscal year on December 31, 2017, were as follows:

NAME	Position
Jeffrey D. Marrazzo	Chief Executive Officer
Katherine A. High, M.D.	President and Head of Research and Development
Stephen W. Webster	Chief Financial Officer
Daniel R. Faga	Chief Business Officer
Joseph W. La Barge	Chief Legal Officer

Say-on-pay and transition from Emerging Growth Company status

Pursuant to Section 14A of the Exchange Act, at our 2017 Annual Meeting of Stockholders, or the 2017 Annual Meeting, our stockholders voted, in a non-binding, advisory manner, on a proposal to approve our named executive officers' compensation, which is commonly referred to as the "say-on-pay" vote. Prior to 2017, we were an "emerging growth company" under applicable federal securities law and, as a result, we did not hold a say-on-pay-vote at our annual meeting prior to the 2017 Annual Meeting. At the 2017 Annual Meeting, 99.8% of the votes cast by stockholders on this proposal were cast in support of the compensation paid to our named executive officers. While this vote is considered to be a non-binding advisory vote, our Compensation Committee and Board value the opinions of our stockholders and seriously consider the voting results when making future executive compensation decisions. Given the high level of support evidenced by last year's say-on-pay vote, our Compensation Committee determined that our stockholders generally are supportive of our current executive compensation philosophy and program. As a result, our Compensation Committee decided to maintain our approach to executive compensation and declined to make significant changes to our executive compensation program. Nevertheless, our Compensation Committee and Board will continue to monitor the executive compensation program to ensure it aligns the interests of our executive officers with the interests of our stockholders and adequately addresses any stockholder concerns that may be expressed in future votes.

Consistent with the recommendation of our Board and the preference of our stockholders as reflected in the non-binding advisory vote on the frequency of future “say-on-pay” votes conducted at our 2017 Annual Meeting of Stockholders, we intend to provide for annual advisory votes on the compensation of our named executive officers. The purpose of the following is to discuss the principles underlying our policies and decisions with respect to the compensation of our named executive officers, as well as factors considered relevant to this analysis.

Executive summary

We are a leader in the field of gene therapy, seeking to transform the lives of patients suffering from debilitating genetic diseases by developing potentially one-time, life-altering treatments. The goal of gene therapy is to overcome the effects of a malfunctioning, disease-causing gene. Gene therapies have the potential to provide long-lasting effects, dramatically and positively changing the lives of patients with conditions where no, or only palliative, therapies exist.

As described below, during 2017, we made significant progress toward our clinical development and business goals, including the following, which impacted executive compensation:

- Received FDA approval of LUXTURNA™ (voretigene neparvovec-ryzl) for the treatment of patients with vision loss due to confirmed biallelic RPE65 mutation-associated retinal dystrophy;
- Validated European Medicines Agency, or EMA, filing for LUXTURNA;
- Successfully prepared LUXTURNA for commercialization;
- Grew manufacturing capabilities including successful completion of FDA pre-approval inspections of our manufacturing facility and clinical trial sites and first approval of a United States AAV manufacturing facility;
- Advanced our product development pipeline to support long-term growth, including demonstrating human proof-of-concept of SPK-8011, our product candidate for hemophilia A;
- Completed an equity financing with approximately \$380 million in net proceeds to fund future clinical trials, manufacturing and commercialization activities and potential future acquisitions or licensing opportunities;
- Received a Rare Pediatric Disease Priority Review Voucher, or PRV, in connection with FDA approval of LUXTURNA;
- Fostered a culture that embodies the Company's mission, vision and shared values; and
- Continued expansion of key talent and capabilities.

The goal of our Compensation Committee is to ensure that our compensation programs are aligned with the interests of our stockholders and our business goals, while ensuring that the total compensation paid to each of our executive officers is fair, reasonable and competitive. We target our executives' overall total compensation to be within a competitive range of the market median of similar companies in terms of industry, number of employees, lifecycle, prevalence of programs and value provided, where quantifiable. The overall objectives of our executive compensation program are as follows:

- attract, retain and motivate superior executive talent;
- provide incentives that reward the achievement of performance goals that directly correlate to the enhancement of stockholder value, as well as facilitate employee retention; and
- align the interests of executives with those of stockholders through long-term incentives linked to individual and Company performance.

Key elements of our compensation programs include the following:

Element	Purpose	Features
Base salary	To attract and retain highly skilled executives.	Fixed component of pay to provide financial stability, based on responsibilities, experience, individual contributions and peer company data.
Annual cash incentive program	To promote and reward the achievement of key short-term strategic and business goals of the Company as well as individual performance; to motivate and attract executives.	Variable component of pay based on quantitative and qualitative annual Company and individual goals.
Long-term equity	To encourage executives and other employees to focus on long-term	Typically, subject to multi-year vesting based on continued service primarily in the form of stock options and restricted

incentive
compensation

Company performance; to facilitate
retention; to reward outstanding
Company and individual performance.

stock units, the value of which depends on the performance
of our common stock, in order to align executive interests
with those of our stockholders over the long-term.

In addition to our direct compensation elements, the following compensation program features are designed to align our executive officers with stockholder interests and market best practices:

What We Do

- üMaintain commitment to pay-for-performance philosophy
- üMaintain an industry-specific peer group for benchmarking compensation
- üTarget compensation based on market norms
- üDeliver compensation primarily through performance-based pay
- üOffer market-competitive benefits that are consistent with our Company-wide compensation strategy
- üConsult with an independent advisor on compensation levels and practices
- üMaintain significant stock ownership guidelines for our non-employee directors and executive officers

What We Don't Do

- ûAllow hedging or pledging of equity
- ûRe-price stock options
- ûProvide excessive perquisites
- ûProvide tax gross-up payments for any change-of-control payments

Introduction of stock ownership guidelines

Effective in February 2018, our Compensation Committee approved and our Board ratified stock ownership guidelines for our non-employee directors and our executive officers. These stock ownership guidelines were established in consultation with our compensation consultant and based in part on practice by our Compensation Peer Group, as defined below, and survey data for comparable organizations. We believe these guidelines, together with our long-term incentive compensation, further demonstrate our commitment to aligning the interests of our non-employee directors and executive officers with those of our stockholders, and enable our non-employee directors and named executive officers to share in our long-term growth and success.

Our stock ownership guidelines encourage our non-employee directors and executive officers to acquire and maintain an equity interest in the Company with a value based on a multiple of their cash retainer and base salary, respectively. The following equity holdings count toward satisfying the stock ownership guidelines:

- Stock directly owned and/or deferred (including vested restricted shares and shares held in retirement accounts);
- Vested and unexercised stock options; and
- Unvested restricted stock and restricted stock units.

We have established the following guidelines for 2018:

Role	Stock Ownership Guideline
Non-employee Director	3x annual cash retainer
Chief Executive Officer	3x base salary
All other executive officers	1x base salary

All of our executive officers and non-employee directors must be in compliance with the applicable stock ownership guidelines by the later of five years after the date of the introduction of the guidelines and the date such individual was determined to be an executive officer or was appointed as a director, as applicable. Based on a preliminary analysis of current levels of base salary and annual retainers, annual restricted stock unit grant levels and our current stock price, we expect all covered individuals to be in compliance with the guidelines within five years, if not sooner.

Compensation benchmarking

In designing our executive compensation program, our Compensation Committee works directly with management and considers publicly available compensation data (public proxy and compensation survey data) for comparable life sciences companies to help guide its executive compensation decisions. Further, in 2017, our Compensation Committee continued its engagement with Willis Towers Watson as its independent compensation consultant to provide strategic advice on matters related to executive and non-employee director compensation. Although our Compensation Committee considers the advice and recommendations of Willis Towers Watson, our Compensation Committee makes its own decisions about these matters. In the future, we expect that our Compensation Committee

will continue to engage an independent compensation consultant to provide strategic guidance on our executive compensation programs and to conduct further competitive benchmarking based on relevant market data.

The Compensation Committee reviewed information regarding the independence and potential conflicts of interest of Willis Towers Watson, taking into account, among other things, the factors set forth in the NASDAQ Listing Rules. Based on such review, the Compensation Committee concluded that the engagement of Willis Towers Watson did not raise any conflict of interest, and Willis Towers Watson served as an independent advisor.

In evaluating the total compensation of our named executive officers, our Compensation Committee, as advised by Willis Towers Watson, establishes a peer group of publicly traded life sciences companies that is selected considering the following criteria:

- companies with a number of employees, market capitalization and stage of development comparable to us;
- companies against which we compete for executive talent; and
- public companies headquartered in the U.S. for which compensation data are available.

For the purpose of informing 2018 compensation benchmarking decisions, the Compensation Committee, with the advice of Willis Towers Watson, examined our existing peer group in light of the following factors:

- our growth in 2017, which is anticipated to continue in 2018;
- the stage of development of our product, product candidates and clinical programs; and
- changes in our market capitalization.

Following this review, we modified the existing peer group by removing eight companies: Alder Biopharmaceuticals, Aduro BioTech, Coherus Biosciences, Heron Therapeutics, Kite Pharma, MacroGenics, Momenta Pharmaceuticals and Ophthotech; and adding seven companies: Agios Pharmaceuticals, Alnylam Pharmaceuticals, Array BioPharma, Clovis Oncology, Intercept Pharmaceuticals, Intexron Corporation and Ionis Pharmaceuticals. These changes were based on our headcount growth relative to peer companies, our market capitalization relative to the market capitalization of peer group companies and other business metrics, including evaluation of companies with whom we compete for talent, therapeutic areas and the status of peers' pipeline programs. The resulting "Compensation Peer Group" was approved by our Compensation Committee and is comprised of the following 20 companies:

ACADIA Pharmaceuticals	Exelixis	Neurocrine Biosciences
Agios Pharmaceuticals	Halozyne Therapeutics	Portola Pharmaceuticals
Alnylam Pharmaceuticals	Insmed	Sage Therapeutics
Amicus Therapeutics	Intercept Pharmaceuticals	Sarepta Therapeutics
Array BioPharma	Intrexon	Tesaro
bluebird bio	Ionis Pharmaceuticals	Ultragenyx Pharmaceutical
Clovis Oncology	Juno Therapeutics	

We believe that reviewing the compensation level and practices of the Compensation Peer Group, in addition to the compensation survey data, provide the Compensation Committee with appropriate market references for evaluating named executive officer compensation.

We utilize multiple compensation surveys in setting named executive compensation levels and evaluating leading practices, including:

- Mercer's Strategic Industry Rewards Solutions;
- Radford's Global Life Sciences Compensation Survey; and
- Willis Towers Watson's Pharmaceutical and Health Sciences Executive Compensation DataBank.

Other key factors in determining executive compensation

In addition to market competitive practices based on the Compensation Peer Group and compensation survey data, other performance factors we consider when determining the compensation of our named executive officers include:

- achievement of U.S. commercialization readiness goals with respect to LUXTURNA;
- key research and development achievements, including advances in our clinical product candidates;
- initiation and progress of clinical trials;
- expansion of manufacturing and operational capabilities;

- achievement of regulatory milestones;
- establishment/maintenance of key strategic relationships and new business initiatives, including financings;
- development of organizational capabilities and managing our growth; and
- continued operations expansion.

Executive compensation evaluation process

Our Compensation Committee intends that if we achieve our corporate goals and an 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 toward the 50th percentile of the market data. However, the Compensation Committee does not apply that targeted positioning formulaically and allows for individuals to be positioned at different percentiles based on factors such as experience, historical performance, scope of duties and responsibilities and criticality to our business.

In order to accomplish its objectives consistent with its philosophy for executive compensation, the 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 and the estimated payout obligations under severance and change in control scenarios;
- consults with Willis Towers Watson, our independent compensation consultant;
- holds executive sessions, without management present; and
- reviews information regarding the performance and executive compensation of other companies.

Goals for executive leadership are determined during our annual goal-setting process. We first determine goals for the Company as a whole, which helps decide goals for each executive individually. Annual corporate goals are proposed by management and approved by the Board. These corporate goals target the achievement of specific commercial, research, clinical, operational and financial objectives. The Compensation Committee determines how the various components of our annual Company goals will contribute to the overall performance evaluation.

Annual individual goals focus on contributions that facilitate the achievement of the corporate goals and are closely aligned with the corporate goals. Individual goals are proposed at the start of each year for each executive and approved by the Chief Executive Officer and, as appropriate, the Compensation Committee. The individual performance goals of each 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.

At the end of each year, the Compensation Committee evaluates corporate and individual performance. The Compensation Committee considers the achievement of the corporate goals and individual performance as factors in determining annual salary increases, annual bonuses and equity awards granted, if any, to our executive officers. In assessing corporate performance, the Compensation Committee evaluates corporate performance against the approved corporate goals for the year and also evaluates other aspects of corporate performance, including achievements and progress made 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 executive 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 equity awards and bonuses, if any, for the other executive officers, which are then reviewed and approved or adjusted by the Compensation Committee. In the case of the Chief Executive Officer, the Compensation Committee conducts his individual performance evaluation.

For all executives, annual base salary increases, if any, are implemented during the first quarter of the calendar year. Annual equity awards and bonuses, if any, are granted as determined by the Compensation Committee. For 2017, equity awards and annual bonuses were awarded in the first half of 2018.

Base salary

We provide base salaries to our executive officers to compensate them with a fair and competitive base level of compensation. Our Compensation Committee typically determines base salary levels based on the executive's responsibilities, experience, contributions, performance and, if applicable, the base salary level of the executive prior to joining the Company. In addition, our Compensation Committee reviews and considers base salaries paid by our peer group and from

21

compensation survey data for similar positions. Our Compensation Committee believes executive salaries should be targeted within a competitive range of the market median, although it retains discretion to position executives higher or lower than market median based upon an executive's experience, performance or other considerations.

With respect to Mr. Marrazzo, in January 2018, our Compensation Committee reviewed Mr. Marrazzo's overall compensation and determined, based on his strong accomplishments during the year and the comparison to the median base salary of chief executive officers in our Compensation Peer Group and relevant compensation survey data, to increase his annual base salary to from \$565,000 to \$595,000.

At the beginning of 2018, our Compensation Committee approved base salary increases for each of our other named executive officers, based upon the recommendation of the Chief Executive Officer and each named executive officer's achievement of individual goals and the comparison to the base salary of similar executives in our Compensation Peer Group and relevant compensation survey data. The table below sets forth the adjustments to base salary for each of our named executive officers:

2018 Base Salary Increases

Executive Officer	2017 Base Salary	2018 Base Salary
Jeffrey D. Marrazzo	\$565,000	\$595,000
Katherine A. High, M.D.	\$450,000	\$470,000
Stephen W. Webster	\$415,000	\$440,000
Daniel R. Faga	\$410,000	\$430,000
Joseph W. La Barge	\$385,000	\$400,000

Annual cash incentive program

Our Compensation Committee aims to determine an appropriate mix of cash payments and equity incentive awards to meet short- and long-term goals and objectives. In January 2018, our Compensation Committee approved the 2017 annual incentive program payment pool and corporate modifier, including the opportunity for eligible participants to achieve incentive awards above established bonus targets based on performance relative to our 2017 primary corporate objectives.

Consistent with the Company-wide annual incentive program approved by the Compensation Committee and applicable to all employees, including our named executive officers, both a corporate performance modifier and individual performance modifier factored into the determination of each executive officer's cash bonus award with respect to 2017.

Under the terms of our incentive plan, the corporate performance modifier 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 to 125%. The individual performance modifier is based on the degree to which individual performance objectives have been achieved, the competencies and behaviors demonstrated in achieving results and the completion of the ongoing responsibilities required by the position. The individual performance score may range from 0 to 125% and is approved by the Compensation Committee. The individual's actual award is then calculated as follows:

The table below outlines our corporate objectives for 2017, and the corresponding highlights and accomplishments related to each.

Primary corporate objectives	Key highlights and accomplishments
Successfully prepare LUXTURNA for commercialization	<ul style="list-style-type: none"> üSubmitted BLA to secure timely FDA action on LUXTURNA üReceived FDA approval in December, ahead of the Prescription Drug User Fee Act, or PDUFA, date, with broad label to support appropriate patient care üExecuted on U.S. launch preparations for LUXTURNA üEstablished the foundations of unique commercial programs supporting access to and pricing of LUXTURNA in the U.S. üSecured a PRV üMaintained track record of safety across all clinical programs
Advance product and technology portfolio to support long-term growth	<ul style="list-style-type: none"> üEstablished human proof-of-concept in SPK-8011 for hemophilia A üExpand clinical pipeline to progress toward human proof-of-concept in an additional genetic disease üDeveloped a manufacturing capacity plan that supports the pipeline across different demand scenarios <ul style="list-style-type: none"> üExecuted against plan to increase clinical supply capacity üAdvanced our suspension cell culture manufacturing system toward commercial scale
Grow manufacturing capabilities	<ul style="list-style-type: none"> üManaged the expanded Pfizer collaboration to successfully transition the program to Pfizer in 2018
Advance the scale-up of an efficient global organization	<ul style="list-style-type: none"> üHired key personnel and established infrastructure to support our global operating model üEstablished more robust governance structure to clarify decision rights, improve communications and ensure alignment with corporate goals üManaged capital efficiently
Foster a culture that embodies the Company's mission, vision and shared values	<ul style="list-style-type: none"> üDeveloped a culture and engagement plan to motivate and inspire our colleagues üEffectively implemented change management programs to support our transition to a commercial organization üDefined and enhanced leadership capabilities to manage our growth

Based upon the above achievements, the Compensation Committee determined to use a corporate performance modifier of 115% for the 2017 bonus calculation.

In assessing each named executive officer's individual performance modifier, the Compensation Committee further agreed:

Mr. Marrazzo:

- met or exceeded overall Company objectives;
- demonstrated exemplary leadership in support of expanding organizational capabilities;
- advanced the scale-up of an efficient global, fully-integrated organization; and
- fostered an engaging culture that embodies our mission, vision and shared values.

Dr. High:

- continued to build organizational capabilities;
- submitted BLA to secure timely FDA action on LUXTURNA;

- received FDA approval in December for LUXTURNA, ahead of PDUFA date, with a broad label to support appropriate patient care;
- established human proof of concept in SPK-8011 for hemophilia A;
- advanced our product and technology portfolio; and
- continued to progress pre-clinical and emerging programs.

Mr. Webster:

- continued to build organizational capabilities;
- successfully oversaw internal and external financial management and SOX compliance;
- prepared finance team and internal resources to support commercial organization; and
- executed follow-on financing with approximately \$380 million in net proceeds.

Mr. Faga:

- continued to build organizational capabilities;
- supported successful LUXTURNA advisory committee meeting;
- executed various in-licensing transactions, including agreement with Genethon for SPK-GAA for Pompe disease;
- managed our expanded Pfizer collaboration, including amending our agreement with Pfizer to formalize transition of SPK-9001;
- supported decision making regarding advancement of our product and technology portfolio; and
- negotiated partnership with Novartis Pharma AG to commercialize LUXTURNA outside the U.S.

Mr. La Barge:

- continued to build organizational capabilities;
- oversaw support of label negotiations with FDA for LUXTURNA providing broad label to support appropriate patient care;
- secured a PRV with BLA approval of LUXTURNA;
- led federal policy development and implementation to support gene therapies and novel reimbursement paradigms for one-time therapeutics; and
- identified and managed enterprise-level risks to the Company.

The table below shows the target award under the incentive program as a percentage of each named executive officer's 2017 base salary and the actual cash bonus payments to our named executive officers for 2017 performance, which were paid in the first half of 2018.

2017 Annual Incentive Payouts

Name	2017 Target (% of Salary)	2017 Target (\$ Value)	Corporate Performance Modifier	Individual Performance Modifier	2017 Actual Bonus (\$)	2017 Bonus (% of Target)
Jeffrey D. Marrazzo	60 %	339,000	115%	115%	448,328	132%
Katherine A. High, M.D.	45 %	202,500	115%	112.5%	261,984	129%
Stephen W. Webster	40 %	166,000	115%	115%	219,535	132%
Daniel R. Faga	40 %	164,000	115%	120%	226,320	138%
Joseph W. La Barge	40 %	154,000	115%	117.5%	208,093	135%

Target cash incentive compensation for our named executive officers in 2018

The terms of the 2018 incentive program are substantially the same as the 2017 incentive program. The 2018 annual incentive program includes an opportunity for each named executive officer to achieve his or her target award percentage based on the achievement of our 2018 corporate goals and individual performance objectives.

The table below shows the target award under the incentive program as a percentage of each named executive officer's 2018 base salary, as well as the target annual incentive award opportunity in dollars for 2018.

2018 Target Annual Incentive

Name	2018 Target (% of Salary)	2018 Target (\$ Value)
Jeffrey D. Marrazzo	60%	357,000
Katherine A. High, M.D.	45%	211,500
Stephen W. Webster	40%	176,000
Daniel R. Faga	40%	172,000
Joseph W. La Barge	40%	160,000

Long-term incentive compensation

Our equity awards are designed to:

- reflect long-term stockholder value creation over a sustained period;
- align financial interests of employees with stockholders;
- recognize current performance as well as the expectation of future contributions;
- provide meaningful awards to support and encourage stock ownership; and
- retain key employees.

The market for qualified, talented executives in our industry is highly competitive. Accordingly, we believe equity compensation is a crucial component of our competitive executive compensation package and, as such, makes up the majority of our total executive compensation package.

We typically grant equity awards to each executive officer upon commencement of employment and annually in conjunction with our review of individual performance. Beginning in 2017, equity awards for our named executive officers have consisted of a combination of time-based stock options and restricted stock units. The mix is more heavily weighted toward options than restricted stock units (70% options; 30% restricted stock units), which proportion we consider an appropriate balance of incentivizing continued stockholder value creation and promoting retention.

All equity awards to our named executive officers are approved by our Compensation Committee and, other than awards to new hires, typically are granted at our Compensation Committee's first regularly scheduled meeting each year. No employment agreement contractually requires that a certain level of equity awards is awarded each year. Equity awards vary among our named executive officers based on their position and annual performance assessments. Each job level has a target annual grant level, which our Compensation Committee developed based on market data and input from our independent compensation consultant, Willis Towers Watson. The target annual grant level is used as a starting point in developing grant recommendations for each of the named executive officers. In addition, we review all components of compensation holistically to ensure total compensation is aligned with our overall philosophy and objectives.

All stock options that we grant have an exercise price equal to the fair market value of our stock on the grant date, so that the recipient will not earn any compensation from options unless our share price increases above the exercise price. Accordingly, this portion of compensation is at risk and is directly aligned with stockholder value creation. In addition, equity awards granted to our executives vest over four years, which we believe provides an incentive to our executives to add value to the Company over the long term and to remain employed with the Company. All stock options have a ten-year term. Beginning in 2017, stock options and restricted stock units vest annually over a four-year period. Vesting of equity awards to employees ceases upon termination of employment and exercise rights for vested stock options at time of termination typically cease three months following termination, except in the case of death or disability. Prior to the exercise of an option, the option holder does not have any rights as a stockholder with respect to the shares subject to such option.

In connection with the annual review of each named executive officer's individual performance and consistent with our compensation philosophy, in January 2018, our Compensation Committee approved annual equity incentive awards for our named executive officers. The January 2018 equity awards granted to our named executive officers are set forth in the table below:

2018 Annual Equity Incentive

Name	Stock options (#)	Restricted stock units (#)
Jeffrey D. Marrazzo	52,500	15,000
Katherine A. High, M.D.	31,500	9,000
Stephen W. Webster	28,000	8,000
Daniel R. Faga	35,000	10,000
Joseph W. La Barge	28,000	8,000

We believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. We believe these equity

grants, together with our stock ownership guidelines, further demonstrate our commitment to aligning the interests of our non-employee directors and executive officers with those of our stockholders and enable our non-employee directors and executive officers to share in our

25

long-term growth and success. In addition, we believe that equity grants with a time-based vesting feature promote executive retention because this feature incentivizes our executives to remain in our employment during the vesting period. Accordingly, our Board periodically reviews the equity incentive compensation of our executive officers and, from time to time, may grant equity incentive awards to them in the form of stock options or other equity awards. Our insider trading policy expressly prohibits short sales and derivative transactions by our employees; or other hedging or monetization transactions accomplished through the use of prepaid variable forwards, equity swaps, collars and exchange funds. In addition, our insider trading policy expressly prohibits our employees from purchasing our securities on margin, borrowing against Company securities held in a margin account or pledging our securities as collateral for a loan.

Rule 10b5-1 plans

Certain of our executive officers have previously adopted, and our other executive officers may in the future adopt, written plans, known as Rule 10b5-1 plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis. Under a Rule 10b5-1 plan, a broker executes trades pursuant to parameters established by the officer when entering into the plan, without further direction from the director or officer. It also is possible that the officer could amend or terminate the plan when not in possession of material, nonpublic information. In addition, our executive officers may buy or sell additional shares outside of a Rule 10b5-1 plan when they are not in possession of material, nonpublic information.

Benefits and other compensation

401(k) retirement plan

In 2017, we maintained a 401(k) retirement plan that was intended to be a tax-qualified defined contribution plan under Section 401(k) of the Internal Revenue Code. All of our employees were eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan included a salary deferral arrangement pursuant to which participants elected to reduce their current compensation by up to the statutorily prescribed limit, equal to \$18,000 in 2017, and have the amount of the reduction contributed to the 401(k) plan. Participants who were at least 50 years old also could make “catch-up” contributions, which in 2017 may be up to an additional \$6,000 above the statutory limit. We also made discretionary matching contributions to our 401(k) plan equal to 100% of the employee contributions up to 6% of the employee’s salary, subject to the statutorily prescribed limit, equal to \$18,000 in 2017. The match immediately vested in full.

Health and welfare benefits

Our named executive officers are eligible to participate in all of our employee benefit plans, including our medical, dental, vision, life and disability insurance plans, in each case on the same basis as other employees. We believe that these health and welfare benefits help ensure that we have a productive and focused workforce through reliable and competitive health and other benefits.

Compliance with IRS Code Section 162(m)

Section 162(m) of the Internal Revenue Code of 1986, as amended, or the Code, generally disallows a tax deduction to public companies for compensation in excess of \$1 million paid to each of the company’s chief executive officer and the three most highly compensated executive officers (other than the chief executive officer and chief financial officer). Pursuant to tax legislation signed into law on December 22, 2017 (the “Tax Act”), for taxable years beginning after December 31, 2017, the Section 162(m) deduction limitation is expanded so that it also applies to compensation in excess of \$1 million paid to a public company’s chief financial officer. Historically, compensation that qualified under Section 162(m) as performance-based compensation was exempt from the deduction limitation. However, subject to certain transition rules, the Tax Act eliminated the qualified performance-based compensation exception. As a result, for taxable years beginning after December 31, 2017, all compensation in excess of \$1 million paid to each of the executives described above (other than certain grandfathered compensation or compensation paid pursuant to certain equity awards granted during the transition period following our initial public offering) will not be deductible

by us.

Compensation risk assessment

We believe that our executive compensation program does not encourage excessive or unnecessary risk taking. This is primarily due to the fact that our compensation programs are designed to encourage our executive officers and other employees to remain focused on both short-term and long-term strategic goals, in particular in connection with our pay-for-performance compensation philosophy. As a result, we do not believe that our compensation programs are reasonably likely to have a material adverse effect on us.

26

Report of the Compensation Committee on executive compensation

Our Compensation Committee has reviewed and discussed the “Compensation Discussion and Analysis” required by Item 402(b) of Regulation S-K with management. Based upon such review and discussions, our Compensation Committee recommended to our Board that such section be included in this proxy statement and incorporated by reference in our Annual Report on Form 10-K for the year ended December 31, 2017, which was filed with the SEC on February 27, 2018.

By the Compensation Committee of the Board of Directors of Spark Therapeutics, Inc.,

Vincent Milano, Chairman

Steven M. Altschuler, M.D.

Robert J. Perez

Lota Zoth

Summary compensation table

The following table sets forth information regarding compensation awarded to, earned by or paid to our named executive officers during the fiscal years ended December 31, 2015, 2016 and 2017.

Name and principal position	Year	Salary	Equity awards (1)	Non-equity incentive plan compensation (2)	All other compensation (3)	Total
Jeffrey D. Marrazzo Chief Executive Officer	2017	\$563,462(4)	\$3,859,560	\$ 448,328	\$ 38,942	\$4,910,292
	2016	\$526,731(5)	\$3,575,667	\$ 435,000	\$ 38,056	\$4,575,454
	2015	\$447,039(6)	\$5,670,479	\$ 300,000	\$ 72,343	\$6,489,861
Katherine A. High, M.D. President and Head of Research and Development	2017	\$448,654(7)	\$1,736,802	\$ 261,984	\$ 38,942	\$2,486,382
	2016	\$416,558(8)	\$1,456,637	\$ 260,000	\$ 27,976	\$2,161,171
	2015	\$403,558(9)	\$3,175,603	\$ 230,000	\$ 17,835	\$3,826,996
Stephen W. Webster Chief Financial Officer	2017	\$414,423(10)	\$1,370,390	\$ 219,535	\$ 38,942	\$2,043,290
	2016	\$401,346(11)	\$1,456,637	\$ 215,000	\$ 38,642	\$2,111,625
	2015	\$348,280(12)	\$2,720,941	\$ 221,000	\$ 38,001	\$3,328,222
Daniel R. Faga Chief Business Officer	2017	\$400,616(13)	\$1,543,824	\$ 226,320	\$ 37,532	\$2,208,292
	2016	\$269,231(14)	\$4,052,876	\$ 300,000	\$ 21,055	\$4,643,162
Joseph W. La Barge Chief Legal Officer	2017	\$383,654(15)	\$1,370,390	\$ 208,093	\$ 38,942	\$2,001,079

(1) The amounts reported in the "Equity awards" column reflect the aggregate fair value of share-based compensation awarded during the year computed in accordance with the provisions of Financial Accounting Standards Board Accounting Standard Codification, or ASC, Topic 718, Compensation - Stock Compensation. Note that the amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the executives from the options. See notes 3(k) and 11 of "Notes to Consolidated Financial Statements" in our Annual Report on Form 10-K filed with the SEC on February 27, 2018 for a discussion of the assumptions made by the Company in determining the grant date fair value of our option awards for the fiscal year ended December 31, 2017.

(2) The amounts reported in the "Non-equity incentive plan compensation" column represent bonuses under our annual performance-based cash incentive program. See "Annual cash incentive program" for a description of that program. Annual cash incentive compensation earned during the year is typically paid in the following year. Mr. Faga's payments also represent a sign-on bonus paid in May 2016 of \$150,000.

(3) The compensation included in the "All other compensation" column consists of premiums we paid with respect to each of our named executive officers for: (a) medical, dental and vision insurance; (b) personal accident insurance; (c) life insurance; (d) long-term disability insurance; (e) short-term disability insurance; (f) matching contributions to our 401(k) plan; and (g) additional "safe harbor" contributions to our 401(k) plan for 2015 and 2016.

(4) Mr. Marrazzo's annualized base salary increased to \$565,000 from \$525,000 in 2017.

(5) Mr. Marrazzo's annualized base salary increased to \$525,000 from \$450,000 in 2016.

(6) Mr. Marrazzo's annualized base salary increased to \$450,000 from \$392,000 in 2015.

(7) Dr. High's annualized base salary increased to \$450,000 from \$415,000 in 2017.

(8) Dr. High's annualized base salary increased to \$415,000 from \$405,000 in 2016.

(9) Dr. High's annualized base salary increased to \$405,000 from \$367,171 in 2015.

- (10) Mr. Webster's annualized base salary increased to \$415,000 from \$400,000 in 2017.
- (11) Mr. Webster's annualized base salary increased to \$400,000 from \$350,000 in 2016.
- (12) Mr. Webster's annualized base salary increased to \$350,000 from \$300,000 in 2015.
- (13) Mr. Faga's annualized base salary increased to \$410,000 from \$400,000 in 2017.
- (14) Mr. Faga joined the Company on May 2, 2016. Mr. Faga's annualized base salary for 2016 was \$400,000.
- (15) Mr. La Barge's annualized base salary for 2017 was \$385,000.

Pay ratio

The following is a reasonable estimate, prepared under applicable SEC rules, of the ratio of the annual total compensation of our Chief Executive Officer to the median of the annual total compensation of our other employees. As is permitted under the SEC rules, we used 2017 “base salary” to determine our median employee definition and not total compensation as set forth in our Summary Compensation Table. We annualized pay for those who commenced employment during 2017. Of our 308 total

employees, eleven employees were excluded from six countries (less than 4% of total workforce) as follows: United Kingdom - 6, Ireland - 1, France - 1, Germany - 1, Italy - 1, Switzerland - 1. This resulted in an employee population of 297 that we used for purposes of our Chief Executive Officer pay ratio calculation. Using the fiscal year end date of December 31, 2017, we calculated the median base salary of this employee population. We then produced a sample of employees who were paid within a 5% range of that median base salary and selected an employee from within that group as our median employee. We then determined that this median employee's total compensation for 2017 was \$202,884. The Chief Executive Officer's total compensation for 2017 was \$4,910,292 as disclosed in the Summary Compensation Table. Therefore, our estimate of the ratio of Chief Executive Officer pay to median employee pay is 24:1. Given the different methodologies that various public companies will use to determine an estimate of their pay ratio, the ratio reported above should not be used as a basis for comparison between companies.

Grants of plan-based awards

The following table shows information regarding grants of plan-based awards during the fiscal year end December 31, 2017 to our named executive officers.

Name and principal position	Grant date	Estimated future payouts under non-equity incentive plan awards target (\$)	All other stock awards: Number of shares of stock or units (#)	All other stock and option awards: Number of securities underlying options (#)	Exercise or base price of stock and option awards (\$/share) (1)	Grant date fair value of stock and option award (2)
Jeffrey D. Marrazzo Chief Executive Officer	1/18/2017	—	20,000	70,000	(3)\$56.17	\$3,859,560
Katherine A. High, M.D. President and Head of Research & Development	1/18/2017	—	9,000	31,500	(3)\$56.17	\$1,736,802
Stephen W. Webster Chief Financial Officer	1/18/2017	—	7,000	25,000	(3)\$56.17	\$1,370,390
Daniel R. Faga Chief Business Officer	1/18/2017	—	8,000	28,000	(3)\$56.17	\$1,543,824
Joseph W. La Barge Chief Legal Officer	1/18/2017	—	7,000	25,000	(3)\$56.17	\$1,370,390

The exercise price of these stock options is determined by the Company based on the closing price of its common stock on the Nasdaq Global Select Market on the grant date. See notes 3(k) and 11 of "Notes to Consolidated (1) Financial Statements" in our Annual Report on Form 10-K filed with the SEC on February 27, 2018 for a discussion of the assumptions made by the Company in determining the grant date fair value of our option awards for the fiscal year ended December 31, 2017.

(2) Amounts represent the grant date fair value of the executive officer's stock options and awards, calculated in accordance with FASB ASC Topic 718, using a Black-Scholes valuation model for stock options.

(3) Option awarded with time-based vesting criteria established by the Compensation Committee and described in Compensation Discussion and Analysis above.

Outstanding equity awards at December 31, 2017

The following table sets forth information concerning outstanding equity awards at December 31, 2017 for each of our named executive officers.

Name	Option awards				Stock awards		Market value of shares or units of stock that have not vested (\$)(1)
	Number of securities underlying unexercised options exercisable	Number of securities underlying unexercised options unexercisable	Option exercise price (\$/share)	Option expiration date	Number of shares or units of stock that have not vested		
Jeffery D. Marrazzo	—	70,000	(2) \$56.17	1/17/2027	20,000	(20)\$1,028,400	
	59,063	75,937	(3) \$40.44	1/4/2026	—	—	
	85,938	39,062	(4) \$68.45	3/15/2025	—	—	
	127,437	54,634	(5) \$3.45	7/2/2024	—	—	
Katherine A. High, M.D.	—	31,500	(6) \$56.17	1/17/2027	9,000	(20)\$462,780	
	24,063	30,937	(7) \$40.44	1/4/2026	—	—	
	48,125	21,875	(8) \$68.45	3/15/2025	—	—	
	53,468	19,781	(9) \$3.45	7/2/2024	—	—	
Stephen W. Webster	—	25,000	(10) \$56.17	1/17/2027	7,000	(20)\$359,940	
	24,063	30,937	(11) \$40.44	1/4/2026	—	—	
	41,250	18,750	(12) \$68.45	3/15/2025	—	—	
	71,137	34,878	(13) \$3.45	7/7/2024	—	—	
Daniel R. Faga	—	28,000	(14) \$56.17	1/17/2027	8,000	(20)\$411,360	
	30,000	100,000	(15) \$37.62	5/1/2026	—	—	
Joseph W. La Barge	—	25,000	(16) \$56.17	1/17/2027	7,000	(20)\$359,940	
	19,688	25,312	(17) \$40.44	1/4/2026	—	—	
	30,938	14,062	(18) \$68.45	3/15/2025	—	—	
	2,895	5,788	(19) \$3.45	7/2/2024	—	—	
	629	—	\$3.45	6/10/2024	—	—	

(1) The fair market value of the unvested stock awards was calculated using our common stock price of \$51.42 per share, the closing price of our common stock on the Nasdaq Global Select Market on December 31, 2017.

Represents options to purchase 70,000 shares of common stock granted on January 18, 2017. The shares underlying these options vest as follows: 25% vest on January 18, 2018 and the remainder vests in equal annual installments over the following three years.

Represents options to purchase 135,000 shares of common stock granted on January 5, 2016. The shares underlying these options vest as follows: 25% vest on January 5, 2017 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 125,000 shares of common stock granted on March 16, 2015. The shares underlying these options vest as follows: 25% vested on March 16, 2016 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 437,071 shares of common stock granted on July 2, 2014. The shares underlying these options vest as follows: 25% vested on May 24, 2015 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 31,500 shares of common stock granted on January 18, 2017. The shares underlying these options vest as follows: 25% vest on January 18, 2018 and the remainder vests in equal annual installments over the following three years.

Represents options to purchase 55,000 shares of common stock granted on January 5, 2016. The shares underlying (7) these options vest as follows: 25% vest on January 5, 2017 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 70,000 shares of common stock granted on March 16, 2015. The shares underlying (8) these options vest as follows: 25% vested on March 16, 2016 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 158,249 shares of common stock granted on July 2, 2014. The shares underlying (9) these options vest as follows: 25% vested on May 24, 2015 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 25,000 shares of common stock granted on January 18, 2017. The shares (10) underlying these options vest as follows: 25% vest on January 18, 2018 and the remainder vests in equal annual installments over the following three years.

Represents options to purchase 55,000 shares of common stock granted on January 5, 2016. The shares (11) underlying these options vest as follows: 25% vest on January 5, 2017 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 60,000 shares of common stock granted on March 16, 2015. The shares (12) underlying these options vest as follows: 25% vested on March 16, 2016 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 186,015 shares of common stock granted on July 7, 2014. The shares underlying (13) these options vest as follows: 25% vested on July 7, 2015 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 28,000 shares of common stock granted on January 18, 2017. The shares (14) underlying these options vest as follows: 25% vest on January 18, 2018 and the remainder vests in equal annual installments over the following three years.

Represents options to purchase 160,000 shares of common stock granted on May 2, 2016. The shares underlying (15) these options vest as follows: 25% vest on May 2, 2017 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 25,000 shares of common stock granted on January 18, 2017. The shares (16) underlying these options vest as follows: 25% vest on January 18, 2018 and the remainder vests in equal annual installments over the following three years.

Represents options to purchase 45,000 shares of common stock granted on January 5, 2016. The shares (17) underlying these options vest as follows: 25% vest on January 5, 2017 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 45,000 shares of common stock granted on March 16, 2015. The shares (18) underlying these options vest as follows: 25% vested on March 16, 2016 and the remainder vests in equal quarterly installments over the following three years.

Represents options to purchase 46,308 shares of common stock granted on July 2, 2014. The shares underlying (19) these options vest as follows: 25% vested on May 24, 2015 and the remainder vests in equal quarterly installments over the following three years.

Restricted stock award granted on January 18, 2017. The award vests in four equal annual installments through (20) January 18, 2021.

Option exercises and stock vested

The following table shows the number of shares acquired upon exercise of stock options and the number of shares that vested under restricted stock awards held by each of our named executive officers during the fiscal year ended December 31, 2017.

Name	Option		Stock	
	awards	Option	awards	Stock
	number	awards	number	awards
	of shares	value	of shares	value
	acquired	realized on	acquired	realized on
	on	exercise	on	vesting
	exercise		vesting	
Jeffery D. Marrazzo	160,000	\$9,917,103	—	\$—
Katherine A. High, M.D.	85,000	\$5,349,226	25,000	\$1,452,000
Stephen W. Webster	40,000	\$2,534,997	—	\$—
Daniel R. Faga	30,000	\$1,104,394	—	\$—
Joseph W. La Barge	29,000	\$1,809,053	3,049	\$211,635

Employment, severance and change-in-control arrangements

We have written employment agreements with each of our named executive officers - Mr. Marrazzo, Dr. High, Mr. Webster, Mr. Faga and Mr. La Barge. The agreements with each of our executive officers provide for at-will employment. In addition, each of our executive officers is subject to invention assignment, non-disclosure, non-competition and non-solicitation agreements through separate agreements that were executed and delivered by the executives in connection with their employment agreements.

Potential payments upon termination or change in control

Pursuant to the terms of each executive officer's employment agreement, upon execution and effectiveness of a separation agreement and release of claims, each executive officer is entitled to severance payments if his or her employment is terminated under specified circumstances.

Mr. Marrazzo

If we terminate Mr. Marrazzo's employment without cause, or if Mr. Marrazzo terminates his employment with us for good reason, each as defined in his employment agreement, Mr. Marrazzo is entitled to continue receiving his base salary and insurance benefits for a period of 18 months following the date of termination of employment, the amount of any bonus determined by our Board to be payable to Mr. Marrazzo for the immediately preceding year that has not yet been paid and a payment in an amount equal to the pro rata portion of his target bonus for the fiscal year in which the termination occurs.

If, within 24 months following a change in control, as defined in Mr. Marrazzo's employment agreement, we terminate Mr. Marrazzo's employment without cause or Mr. Marrazzo terminates his employment with us for good reason, Mr. Marrazzo is entitled to continue receiving his base salary for a period of 24 months and insurance benefits for a period of 18 months following the date of termination of employment, the amount of any bonus determined by our Board to be payable to him for the immediately preceding year that has not yet been paid, a payment in an amount equal to the pro rata portion of Mr. Marrazzo's target bonus for the fiscal year in which the termination occurs and an additional payment equal to two times his target bonus for the fiscal year in which the termination occurs.

Other executive officers

If we terminate any of our other executive officers' employment without cause, or if such executive officer terminates his or her employment with us for good reason, each as defined in his or her employment agreement, such executive officer is entitled to continue receiving his or her base salary and insurance benefits for a period of 12 months following the date of termination of employment, the amount of any bonus determined by our Board to be payable to the executive officer for the immediately preceding year that has not yet been paid and a payment in an amount equal to the pro rata portion of his or her target bonus for the fiscal year in which the termination occurs.

If, within 24 months following a change in control, as defined in such executive officer's employment agreement, we terminate such executive officer's employment without cause or such executive officer terminates his or her employment with us for good reason, such executive officer is entitled to continue receiving his or her base salary and insurance benefits for a period of 18 months following the date of termination of employment, the amount of any bonus determined by our Board to be payable to the executive for the immediately preceding year that has not yet been paid, a payment in an amount equal to the pro rata portion of such executive officer's target bonus for the fiscal year in which the termination occurs and an additional payment equal to 1.5 times his or her target bonus for the fiscal year in which the termination occurs.

Equity awards

If we terminate any of our executive officers' employment without cause, or if any such executive officer terminates his or her employment with us for good reason, the vesting periods for such named executive officer's unvested equity awards will accelerate based on the ratio of months worked by the executive during the vesting period to the number of months in the vesting period.

In addition, if there is a change in control, any unvested equity granted prior to the corporate conversion will vest as follows: (a) 50% of the unvested portion of each of our executive officers' unvested equity awards that were outstanding at the time of the change in control will vest immediately, and (b) the remaining 50% will vest in equal quarterly installments over the following two years or, if shorter, over the remaining period of the award's original vesting schedule; provided, however, that the new vesting schedule will not replace any more favorable vesting acceleration provision provided for in any equity award agreement governing an equity award held by such executive officer. Following a termination without cause or for good reason within 24 months of the change in control, such executive officer's unvested equity awards that were outstanding at the time of the change in control will vest in full. To the extent that any severance or other compensation payment to any of our executive officers pursuant to an employment agreement or any other agreement constitutes an "excess parachute payment" within the meaning of Sections 280G and 4999 of the Internal Revenue Code of 1986, as amended, then such executive officer will receive the full amount of such severance and other payments, or a reduced amount intended to avoid the application of Sections 280G and 4999, whichever provides the executive with the highest amount on an after-tax basis.

Potential termination and change-in-control payments

Potential termination and change-in-control payments pursuant to the employment agreements assuming termination or change in control, or CIC, occurred on December 31, 2017 are set forth in the table below using our common stock price of \$51.42, the closing price of our common stock on the Nasdaq Global Select Market on December 31, 2017. In addition to the amounts shown in the table below, each executive would receive payments for amounts of base salary and vacation time accrued through the date of termination and payment for any reimbursable business expenses incurred.

Name	Benefit	Triggering event		
		Change in control (without termination)	Resignation for good reason or termination without cause (Absent a CIC)	Resignation for good reason or termination without cause within 24 months following CIC
Jeffrey D. Marrazzo	Severance payments	\$—	\$ 847,500 (1)	\$ 1,808,000 (2)
	Bonus payment	—	339,000 (3)	339,000 (3)
	Continuation of benefits	—	31,933 (4)	31,933 (4)
	Market value of stock vesting	2,241,437 (5)	815,150 (6)	4,482,981 (7)
	Total	\$2,241,437	\$ 2,033,583	\$ 6,661,914
Katherine A. High, M.D.	Severance payments	\$—	\$ 450,000 (1)	\$ 978,750 (2)
	Bonus payment	—	202,500 (3)	202,500 (3)
	Continuation of benefits	—	21,289 (4)	31,933 (4)
	Market value of stock vesting	875,652 (5)	320,643 (6)	1,751,363 (7)
	Total	\$ 875,652	\$ 994,432	\$ 2,964,546
Stephen W. Webster	Severance payments	\$—	\$ 415,000 (1)	\$ 871,500 (2)
	Bonus payment	—	166,000 (3)	166,000 (3)
	Continuation of benefits	—	21,289 (4)	31,933 (4)
	Market value of stock vesting	1,186,309 (5)	642,030 (6)	2,372,726 (7)
	Total	\$ 1,186,309	\$ 1,244,319	\$ 3,442,159
Daniel R. Faga	Severance payments	\$—	\$ 410,000 (1)	\$ 861,000 (2)
	Bonus payment	—	164,000 (3)	164,000 (3)
	Continuation of benefits	—	19,826 (4)	29,739 (4)
	Market value of stock vesting	895,680 (5)	188,414 (6)	1,791,360 (7)
	Total	\$ 895,680	\$ 782,240	\$ 2,846,099
Joseph W. La Barge	Severance payments	\$—	\$ 385,000 (1)	\$ 808,500 (2)
	Bonus payment	—	154,000 (3)	154,000 (3)
	Continuation of benefits	—	21,289 (4)	31,933 (4)

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Market value of stock vesting	457,758	(5) 166,249	(6) 915,516	(7)
Total	\$457,758	\$726,538	\$1,909,949	

Upon involuntary termination or termination for Good Reason (not associated with a change in control), the Chief Executive Officer is entitled to 18 months base salary, while other named executive officers are eligible for 12 months base salary.

Upon involuntary termination or termination for Good Reason (within 24 months of a change in control), the Chief Executive Officer is eligible for 24 months base salary and two times the target annual incentive, while other named executive officers are eligible for 18 months base salary and 1.5 times the target annual incentive.

Upon involuntary termination or termination for Good Reason, all named executive officers are eligible to receive a prorata bonus for the year of termination based on the executive's individual incentive target and hire date.

Upon termination, named executive officers are eligible for the Company to continue to pay the employer-paid portion of medical and dental benefits. The Chief Executive Officer is entitled to 18 months of the employer-paid portion of benefits for involuntary termination or termination for Good Reason

(not associated with a change-in-control or within 24 months of a change-in-control). Other named executive officers are eligible for 12 months of the employer-paid portion of benefits for involuntary termination or termination for Good Reason (not associated with a change-in-control) and 18 months of the employer-paid portion of benefits for involuntary termination or termination for Good Reason (within 24 months of a change-in-control).

- Upon a change-in-control, vesting for 50% of unvested equity awards will accelerate upon the change-in-control.
- (5) The remaining 50% will continue to vest quarterly over a two-year period or, if shorter, over the remaining period of the award's original vesting schedule.
- (6) Upon an involuntary termination or termination for Good Reason (absent a change-in-control), unvested equity will vest based on the proportion of the vesting schedule worked as of the date of termination.
- (7) Upon an involuntary termination or termination for Good Reason (within 24 months of a change-in-control), all unvested equity awards will vest.

Director compensation

The following table sets forth a summary of the compensation we paid to our non-employee directors during 2017. Neither Mr. Marrazzo nor Dr. High, our directors who also serve as our Chief Executive Officer and our President and Head of Research and Development, respectively, receive any additional compensation for his or her service as a director. The compensation received by Mr. Marrazzo and Dr. High as an employee during 2017 is presented in the "Summary Compensation Table".

Name (1)	Fees earned or paid in cash	Option awards (2)	Stock awards (3)	Total
Steven M. Altschuler, M.D. (4)	\$76,667	\$131,923	\$76,395	\$284,985
A. Lorris Betz, M.D., Ph.D. (5)	\$17,917	\$—	\$—	\$17,917
Lars G. Ekman, M.D., Ph.D.	\$60,833	\$131,923	\$76,395	\$192,756
Anand Mehra, M.D.	\$51,875	\$131,923	\$76,395	\$183,798
Vincent J. Milano	\$50,833	\$131,923	\$76,395	\$182,756
Robert J. Perez (6)	\$—	\$—	\$—	\$—
Elliott Sigal, M.D., Ph.D.	\$53,750	\$131,923	\$76,395	\$185,673
Lota Zoth, CPA	\$55,833	\$131,923	\$76,395	\$187,756

The aggregate number of stock option awards outstanding as of December 31, 2017 for the non-employee members of the Board was: Dr. Altschuler: 47,203, Dr. Betz: 0, Dr. Ekman: 47,203, Dr. Mehra: 47,203, Mr. Milano: 47,203, Dr. Sigal: 48,989, and Ms. Zoth: 22,000. The aggregate number of restricted stock awards outstanding as of December 31, 2017 for the non-employee members of the Board was: Dr. Altschuler: 8,167, Dr. Betz: 0, Dr. Ekman: 1,500, Dr. Mehra: 1,500, Mr. Milano: 1,500, Dr. Sigal: 1,864, and Ms. Zoth: 1,500.

The amounts reported in the Option awards column represent the grant date fair value of the stock options granted to our non-employee directors during 2017 as computed in accordance with ASC Topic 718, Compensation - Stock Compensation, not including any estimates of forfeitures. See note 11 of "Notes to Consolidated Financial Statements" in our Annual Report on Form 10-K filed with the SEC on February 27, 2018 for a discussion of assumptions made by the Company in determining the grant date fair value of our option awards for the fiscal year ended December 31, 2017. Note that the amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the directors from the options. The amounts reported in the Stock awards column represent the grant date fair value of the stock awards granted to our non-employee directors during 2017 as computed in accordance with ASC Topic 718, Compensation - Stock Compensation, not including any estimates of forfeitures.

Prior to July 1, 2015, Dr. Altschuler served as the CEO of CHOP and the CHOP Foundation. Pursuant to his agreement with such entities, Dr. Altschuler continues to hold options to purchase 43,203 shares of common stock as nominee of the CHOP Foundation, which will receive the economic benefit associated with such option awards.

All payments that Dr. Betz received in cash are paid directly to the CHOP Foundation. Any economic value received by Dr. Betz from granted options will be remitted to the CHOP Foundation. Dr. Betz resigned from the Board on June 30, 2017.

Mr. Perez joined the Board in January 2018.

Director compensation arrangements

For 2017, our non-employee directors are compensated for their services on our Board as follows:

upon appointment to the Board, directors receive a one-time stock option award of 8,000 options and 3,000 restricted stock units;

annually, each member of the Board receives a grant of 4,000 stock options and 1,500 restricted stock units, on the date of the annual meeting;

each non-employee director receives an annual retainer of \$40,000;

the chairman of the Board receives an additional annual retainer of \$30,000;

each non-employee director who serves as member of a committee of our Board receives additional compensation as follows:

Audit Committee - an annual retainer of \$10,000; chair an annual retainer of \$20,000;

Compensation Committee - an annual retainer of \$7,500; chair an annual retainer of \$15,000; and

Nominating and Corporate Governance Committee - an annual retainer of \$5,000; chair an annual retainer of \$10,000; and

Science and Technology Committee - an annual retainer of \$5,000; if a non-employee director chair, an annual retainer of \$10,000.

Each annual retainer is payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of each payment will be prorated for any portion of a quarter that a director is not serving on our Board.

Each member of our Board also will continue to be entitled to be reimbursed for reasonable travel and other expenses incurred in connection with attending meetings of the Board and any committee of the Board on which he or she serves.

Limitation of liability and indemnification

Our Restated Certificate of Incorporation limits the personal liability of directors for breach of fiduciary duty to the maximum extent permitted by the Delaware General Corporation Law, or DGCL, and provides that no director will have personal liability to us or to our stockholders for monetary damages for breach of fiduciary duty or other duty as a director. However, these provisions do not eliminate or limit the liability of any of our directors:

- ~~f~~or any breach of the director's duty of loyalty to us or our stockholders;
- ~~f~~or acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- ~~f~~or voting or assenting to unlawful payments of dividends, stock repurchases or other distributions; or
- ~~f~~or any transaction from which the director derived an improper personal benefit.

Any amendment to, or repeal of, these provisions will not eliminate or reduce the effect of these provisions in respect of any act, omission or claim that occurred or arose prior to such amendment or repeal. If the DGCL is amended to provide for further limitations on the personal liability of directors of corporations, then the personal liability of our directors will be further limited to the greatest extent permitted by the DGCL.

In addition, our Restated Certificate of Incorporation provides that we must indemnify our directors and officers and we must advance expenses, including attorneys' fees, to our directors and officers in connection with legal proceedings, subject to very limited exceptions.

We maintain a general liability insurance policy that covers certain liabilities of our directors and executive officers arising out of claims based on acts or omissions in their capacities as directors or executive officers. In addition, we intend to enter into indemnification agreements with each of our directors and executive officers. These indemnification agreements may require us, among other things, to indemnify each such director or executive officer for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by him or her in any action or proceeding arising out of his or her service as one of our directors or executive officers.

Certain of our non-employee directors may, through their relationships with their employers, be insured and/or indemnified against certain liabilities incurred in their capacity as members of our Board.

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, or the Securities Act, may be permitted to directors, executive officers or persons controlling us, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

EQUITY INCENTIVE AND OTHER COMPENSATION PLANS

Stock option and other compensation plans

In this section we describe our 2014 stock incentive plan, as amended to date, or the 2014 plan, our 2015 stock incentive plan, or the 2015 plan, and our 2015 employee stock purchase plan. Prior to our initial public offering, we granted awards to eligible participants under the 2014 plan. Following the effectiveness of the registration statement for our initial public offering, we ceased granting awards under the 2014 plan and started granting awards to eligible participants under the 2015 plan.

2014 plan

The 2014 plan was adopted by our Board and approved by our stockholders in May 2014. The 2014 plan provides for the grant of incentive stock options, nonstatutory stock options, restricted stock awards, restricted stock unit awards, stock appreciation rights and other stock-based awards. Our employees, officers, directors, consultants and advisors are eligible to receive awards under our 2014 plan; however, incentive stock options may only be granted to our employees.

The type of award granted under our 2014 plan and the terms of such award are set forth in the applicable award agreement.

Pursuant to the terms of the 2014 plan, our Board (or a committee delegated by our Board) administers the plan and, subject to any limitations in the plan, selects the recipients of awards and determines:

- the number of shares of our common stock covered by options and the dates upon which the options become exercisable;
- the type of options to be granted;
- the duration of options, which may not be in excess of ten years;
- the exercise price of options, which must be at least equal to the fair market value of our common stock on the date of grant; and
- the number of shares of our common stock subject to, and the terms of any stock appreciation rights, restricted stock awards, restricted stock units or other stock-based awards and the terms and conditions of such awards, including conditions for repurchase, measurement price, issue price and repurchase price (though the measurement price of stock appreciation rights must be at least equal to the fair market value of our common stock on the date of grant and the duration of such awards may not be in excess of ten years).

Effect of certain changes in capitalization.

Upon the occurrence of any of a stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of our common stock other than an ordinary cash dividend, our Board shall equitably adjust:

- the number and class of securities available under the 2014 plan;
- the number and class of securities and exercise price per share of each outstanding option;
- the share and per-share provisions and the measurement price of each outstanding stock appreciation right;
- the number of shares subject to, and the repurchase price per share subject to, each outstanding restricted stock award; and
- the share and per-share related provisions and the purchase price, if any, of each other stock-based award.

Effect of certain corporate transactions

Upon a merger or other reorganization event (as defined in our 2014 plan), our Board may, in its sole discretion, take any one or more of the following actions pursuant to the 2014 plan as to some or all outstanding awards other than restricted stock:

- provide that all outstanding awards shall be assumed, or substantially equivalent awards shall be substituted, by the acquiring or successor corporation (or an affiliate thereof);
- upon written notice to a participant, provide that all of the participant's vested but unexercised awards will terminate immediately prior to the consummation of such reorganization event unless exercised by the participant;

provide that outstanding awards shall become exercisable, realizable or deliverable, or restrictions applicable to an award shall lapse, in whole or in part, prior to or upon such reorganization event;
in the event of a reorganization event pursuant to which holders of shares of our common stock will receive a cash payment for each share surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each award held by a participant equal to (1) the number of shares of our common stock subject to the vested portion of the award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event) multiplied by (2) the excess, if any, of the cash payment for each share surrendered in the

reorganization event over the exercise, measurement or purchase price of such award and any applicable tax withholdings, in exchange for the termination of such award; and/or provide that, in connection with a liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise, measurement or purchase price thereof and any applicable tax withholdings).

Our Board does not need to take the same action with respect to all awards and may take different actions with respect to portions of the same award.

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

Upon the occurrence of a reorganization event other than a liquidation or dissolution, the repurchase and other rights with respect to outstanding awards of restricted stock will continue for the benefit of the successor company and will, unless the Board may otherwise determine, apply to the cash, securities or other property into which shares of our common stock are converted or exchanged pursuant to the reorganization event. Upon the occurrence of a reorganization event involving a liquidation or dissolution, all restrictions and conditions on each outstanding restricted stock award will automatically be deemed terminated or satisfied, unless otherwise provided in the agreement evidencing the restricted stock award.

At any time, our Board may, in its sole discretion, provide that any award under the 2014 plan will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part.

As of April 9, 2018, there were options to purchase 857,747 shares of our common stock outstanding under the 2014 plan, at a weighted-average exercise price of \$4.25 per share, and options to purchase 1,237,880 shares of our common stock had been exercised.

Our Board may amend, suspend or terminate the 2014 plan at any time, except that stockholder approval may be required to comply with applicable law or stock market requirements.

2015 plan

Our 2015 plan, which became effective on January 30, 2015, was adopted by our Board and approved by our stockholders in January 2015. The 2015 plan provides for the grant of incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock units and other stock-based awards. Under the 2015 plan, the number of shares of our common stock that is reserved for issuance is the sum of: (1) 1,830,000 plus; (2) 209,519 shares reserved for issuance under the 2014 plan that remained available for grant under the 2014 plan immediately prior to the closing of our initial public offering and the number of shares of our common stock subject to outstanding awards under the 2014 plan that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased by us at their original issuance price pursuant to a contractual repurchase right; plus (3) an annual increase, to be added on the first day of each fiscal year, beginning with the fiscal year ending December 31, 2016 and continuing until, and including, the fiscal year ending December 31, 2025, equal to the lowest of 1,724,000 shares of our common stock, 4% of the number of shares of our common stock outstanding on the first day of such fiscal year and an amount determined by our Board. As of December 31, 2017, 727,229 shares were available for issuance under the 2015 Plan. As of January 1, 2018, the number of shares authorized for issuance under the 2015 plan automatically increased, pursuant to the terms of the plan, by 1,485,322 shares of common stock.

Our employees, officers, directors, consultants and advisors are eligible to receive awards under the 2015 plan. Incentive stock options, however, may only be granted to our employees.

Pursuant to the terms of the 2015 plan, our Board (or a committee delegated by our Board) administer the plan and, subject to any limitations in the plan, will select the recipients of awards and determine:

- the number of shares of our common stock covered by options and the dates upon which the options become exercisable;
- the type of options to be granted;
- the duration of options, which may not be in excess of ten years;
-

the exercise price of options, which must be at least equal to the fair market value of our common stock on the date of grant; and
the number of shares of our common stock subject to and the terms of any stock appreciation rights, restricted stock awards, restricted stock units or other stock-based awards and the terms and conditions of such awards, including conditions for repurchase, issue price and repurchase price (though the measurement price of stock appreciation rights must be at least equal to the fair market value of our common stock on the date of grant and the duration of such awards may not be in excess of ten years).

38

If our Board delegates authority to an executive officer to grant awards under the 2015 plan, the executive officer will have the power to make awards to all of our employees, except executive officers. Our Board will fix the terms of the awards to be granted by such executive officer, including the exercise price of such awards (which may include a formula by which the exercise price will be determined), and the maximum number of shares subject to awards that such executive officer may make.

As of April 9, 2018, there were options to purchase 3,178,530 shares of our common stock outstanding under the 2015 plan, at a weighted-average exercise price of \$51.91 per share, and 452,073 options to purchase shares of our common stock had been exercised.

Effect of certain changes in capitalization

Upon the occurrence of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of our common stock other than an ordinary cash dividend, our Board shall equitably adjust:

- the number and class of securities available under the 2015 plan;
- the share counting rules under the 2015 plan;
- the number and class of securities and exercise price per share of each outstanding option;
- the share and per-share provisions and the measurement price of each outstanding stock appreciation right;
- the number of shares subject to, and the repurchase price per share subject to, each outstanding restricted stock award; and
- the share and per-share related provisions and the purchase price, if any, of each other stock-based award.

Effect of certain corporate transactions

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

- provide that all outstanding awards shall be assumed, or substantially equivalent awards shall be substituted, by the acquiring or successor corporation (or an affiliate thereof);
- upon written notice to a participant, provide that all of the participant's unvested and/or vested but unexercised awards will terminate immediately prior to the consummation of such reorganization event unless exercised by the participant (to the extent then exercisable);
- provide that outstanding awards shall become exercisable, realizable or deliverable, or restrictions applicable to an award shall lapse, in whole or in part, prior to or upon such reorganization event;
- in the event of a reorganization event pursuant to which holders of shares of our common stock will receive a cash payment for each share surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each award held by a participant equal to (1) the number of shares of our common stock subject to the vested portion of the award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event) multiplied by (2) the excess, if any, of the cash payment for each share surrendered in the reorganization event over the exercise, measurement or purchase price of such award and any applicable tax withholdings, in exchange for the termination of such award; and/or
- provide that, in connection with a liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise, measurement or purchase price thereof and any applicable tax withholdings).

Our Board does not need to take the same action with respect to all awards, all awards held by a participant or all awards of the same type.

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

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

The 2015 plan provides that, except to the extent specifically provided to the contrary in an award agreement or any other agreement between the participant and us, immediately prior to a change in control event (as defined in our 2015 plan), the vesting schedule of each outstanding option and restricted stock award shall be accelerated in part so that 50% of the unvested portion of such award shall immediately become exercisable or free from forfeiture or repurchase, as applicable, and the remaining 50% shall vest in substantially equal quarterly installments over the following two years, or, if shorter, in accordance with the original vesting schedule set forth in the award agreement governing such award. Additionally, each such option or restricted stock award shall vest in full and become exercisable or free from forfeiture or repurchase, as applicable, if, on or prior to the second anniversary of the change in control event, the participant's employment with the Company or the acquiring company is terminated for good reason by the participant or is terminated without cause by the Company or the acquiring corporation (as such terms are defined in the 2015 plan). However, if the acquiring corporation does not provide for the assumption or substitution of unvested options or restricted stock awards in connection with the change in control event, each such option and restricted stock award shall vest in full and become exercisable or free from forfeiture or repurchase, as applicable, immediately prior to the change in control event. Our Board may specify in an award agreement at the time of grant the effect of a change in control event on an restricted stock units, stock appreciation rights or other stock-based awards.

At any time, our Board may, in its sole discretion, provide that any award under the 2015 plan will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in whole or in part as the case may be.

No award may be granted under the 2015 plan on or after January 29, 2025. Our Board may amend, suspend or terminate the 2015 plan at any time, except that stockholder approval may be required to comply with applicable law or stock market requirements.

2015 employee stock purchase plan

Our 2015 employee stock purchase plan, or the 2015 ESPP, which became effective upon the closing of our initial public offering, was adopted by our Board and approved by our stockholders in January 2015. The 2015 ESPP is administered by our Board or by a committee appointed by our Board. The 2015 ESPP initially provided participating employees with the opportunity to purchase an aggregate of 220,000 shares of our common stock. The number of shares of our common stock reserved for issuance under the 2015 ESPP automatically will increase on the first day of each fiscal year, beginning with the fiscal year ending December 31, 2016, and continuing until, and including, the fiscal year ending December 31, 2026, in an amount equal to the lowest of: (1) 440,000 shares of our common stock; (2) 1% of the total number of shares of our common stock outstanding on the first day of the applicable fiscal year; and (3) an amount determined by our Board. For the year ended December 31, 2017, we issued 11,804 shares of common stock pursuant to the 2015 ESPP. As of January 1, 2018, the number of shares authorized for issuance under the 2015 ESPP automatically increased, pursuant to the terms of the plan, by 371,330 shares of common stock.

All of our employees and employees of any of our designated subsidiaries, as defined in the 2015 ESPP, are eligible to participate in the 2015 ESPP, provided that:

• such person is customarily employed by us or a designated subsidiary for more than 20 hours a week and for more than five months in a calendar year; and

• such person was our employee or an employee of a designated subsidiary at least fifteen business days prior to the first day of the applicable offering period under the 2015 ESPP.

No employee may purchase shares of our common stock under the 2015 ESPP and any of our other employee stock purchase plans in excess of \$25,000 of the fair market value of our common stock (as of the date of the option grant) in any calendar year. In addition, no employee may purchase shares of our common stock under the 2015 ESPP that would result in the employee owning 5% or more of the total combined voting power or value of our stock.

Each offering will consist of a six-month offering period during which payroll deductions will be made and held for the purchase of our common stock at the end of the offering period. Our Board may, at its discretion, choose a different period of not more than 12 months for offerings.

On the commencement date of each offering period, each eligible employee may authorize up to a maximum of 15% of his or her compensation to be deducted by us during the offering period. Each employee who continues to be a participant in the 2015 ESPP on the last business day of the offering period will be deemed to have exercised an option to purchase from us the number of whole shares of our common stock that his or her accumulated payroll deductions on such date will buy, not in excess of the maximum numbers set forth above. Under the terms of the 2015 ESPP, the purchase price shall be determined by our Board for each offering period and will be at least 85% of the applicable closing price of our common stock. If our Board does not make a determination of the purchase price, the purchase price will be 85% of the lesser of the closing price of our common stock on the first business day of the offering period or on the last business day of the offering period.

An employee may, for any reason, withdraw from participation in an offering prior to the end of an offering period and permanently withdraw the balance accumulated in the employee's account. If an employee elects to discontinue his or her payroll deductions during an offering period but does not elect to withdraw his or her funds, funds previously deducted will be applied to the purchase of common stock at the end of the offering period. If a participating employee's employment ends before the last business day of an offering period, no additional payroll deductions will be made and the balance in the employee's account will be paid to the employee.

We will be required to make equitable adjustments to the number and class of securities available under the 2015 ESPP, the share limitations under the 2015 ESPP and the purchase price for an offering period under the 2015 ESPP to reflect stock splits, reverse stock splits, stock dividends, recapitalizations, combinations of shares, reclassifications of shares, spin-offs and other similar changes in capitalization or events or any dividends or distributions to holders of our common stock other than ordinary cash dividends.

In connection with a merger or other reorganization event (as defined in the 2015 ESPP), our Board or a committee of our Board may take any one or more of the following actions as to outstanding options to purchase shares of our common stock under the 2015 ESPP on such terms as our Board or committee determines:

provide that options shall be assumed, or substantially equivalent options shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof);

upon written notice to employees, provide that all outstanding options will be terminated immediately prior to the consummation of such reorganization event and that all such outstanding options will become exercisable to the extent of accumulated payroll deductions as of a date specified by our Board or committee in such notice, which date shall not be less than ten days preceding the effective date of the reorganization event;

upon written notice to employees, provide that all outstanding options will be cancelled as of a date prior to the effective date of the reorganization event and that all accumulated payroll deductions will be returned to participating employees on such date;

in the event of a reorganization event under the terms of which holders of our common stock will receive upon consummation thereof a cash payment for each share surrendered in the reorganization event, change the last day of the offering period to be the date of the consummation of the reorganization event and make or provide for a cash payment to each employee equal to (1) the cash payment for each share surrendered in the reorganization event times the number of shares of our common stock that the employee's accumulated payroll deductions as of immediately prior to the reorganization event could purchase at the applicable purchase price, where the acquisition price is treated as the fair market value of our common stock on the last day of the applicable offering period for purposes of determining the purchase price and where the number of shares that could be purchased is subject to the applicable limitations under the 2015 ESPP minus (2) the result of multiplying such number of shares by the purchase price; and/or

provide that, in connection with our liquidation or dissolution, options shall convert into the right to receive liquidation proceeds (net of the purchase price thereof).

The 2015 ESPP may be terminated at any time by our Board. Upon termination, we will refund all amounts in the accounts of participating employees.

Securities authorized for issuance under equity compensation plans

The following table contains information about our equity compensation plans as of December 31, 2017. As of December 31, 2017, we had three equity compensation plans, our 2015 plan, 2015 ESPP and 2014 plan, each of which were approved by our stockholders.

Plan category	Number of securities to be issued upon exercise of outstanding options, vesting of restricted stock and other rights		Weighted-average exercise price of outstanding options, warrants and rights		Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column(a))
	(a)	(b)	(c)	(d)	(e)
Equity compensation plans approved by security holders	4,220,541	(1)\$ 40.11	(2)1,506,901	(3)	(4)
Equity compensation plans not approved by security holders	—	—	—		
Total	4,220,541	\$ 40.11	1,506,901		

(1) Includes 697,667 restricted stock units that will entitle the holder to one share of each unit that vests over the holder's period of continued service to the Company.

The calculation does not take into account the 697,667 shares of common stock subject to outstanding restricted (2) stock units. Such shares will be issued at the time the restricted stock units vests, without any cash consideration payable for those shares.

Consists of shares available for future issuance under the 2015 plan and 2015 ESPP. As of December 31, 2017, (3) 727,229 shares of common stock were available for issuance under the 2015 plan, and 779,672 shares of common stock were available for issuance under the 2015 ESPP.

Our 2015 plan and our 2015 ESPP contains an "evergreen" provision, which allows for an annual increase in the (4) number of shares of common stock available under the plans on the first day of each fiscal year. The annual increase in the number of shares for the 2015 plan, shall be equal to the lowest of 1,724,000 shares of our common stock, 4% of the number of shares of our common stock outstanding on the first day of the fiscal year and an amount determined by our Board. The annual increase in the number of shares for the 2015 ESPP, shall be equal to the lowest of 440,000 shares of our common stock, 1% of the number of shares of our common stock outstanding on the first day of the fiscal year and an amount determined by our Board.

RISK CONSIDERATION IN OUR COMPENSATION PROGRAM

Limits on hedging and pledging

As part of our insider trading policy, all employees, including executive officers and members of our Board, are prohibited from engaging in certain types of hedging transactions involving our securities, specifically short sales, including short sales "against the box," and purchases or sales of puts, calls or other derivative securities. Our insider trading policy also prohibits certain types of pledges of our securities by all employees, including executive officers, and members of our Board, specifically purchases of our securities on margin, borrowing against our securities held in a margin account or pledging our securities as collateral for a loan, with an exception for pledges of our securities as collateral for a loan only after certain prerequisites are met and only with the pre-approval of our Chief Financial Officer or Chief Legal Officer.

Accounting considerations

We account for equity compensation paid to our employees in accordance with ASC Topic 718, which requires us to measure and recognize compensation expense in our financial statements for all stock-based payments based on an estimate of their fair value over the service period of the award. We record cash compensation as an expense at the time the obligation is accrued.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS, MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The following table sets forth information with respect to the beneficial ownership of our common stock, as of April 9, 2018, by:

- each person known by us to beneficially own more than 5% of our common stock;
- each of our directors;
- each of our named executive officers;
- and all of our executive officers and directors as a group.

The number of shares beneficially owned by each stockholder is determined under rules issued by the SEC and includes voting or investment power with respect to securities. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable. The information is not necessarily indicative of beneficial ownership for any other purpose.

The percentage ownership calculations for beneficial ownership are based on 37,282,344 shares of common stock outstanding as of April 9, 2018. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock subject to options, warrants or other rights held by such person that are currently exercisable, or will become exercisable within 60 days of April 9, 2018, are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person.

Unless otherwise indicated, the address of all listed stockholders is 3737 Market Street, Suite 1300, Philadelphia, PA 19104.

Name of beneficial owner	Number of shares beneficially owned	Percentage of shares beneficially owned	
Named Executive Officers and Directors			
Jeffrey D. Marrazzo (1)	662,613	1.8	%
Katherine A. High, M.D. (2)	370,021	1.0	%
Stephen W. Webster (3)	180,192	*	
Daniel R. Faga (4)	48,121	*	
Joseph W. La Barge (5)	81,465	*	
Steven M. Altschuler, M.D. (6)	64,711	*	
Lars Ekman, M.D., Ph.D. (7)	48,703	*	
Anand Mehra, M.D. (8)	529,973	1.4	%
Vincent J. Milano (9)	46,378	*	
Robert J. Perez	—	*	
Elliott Sigal, M.D., Ph.D. (10)	97,262	*	
Lota Zoth, CPA (11)	20,500	*	
All executive officers and directors as a group (15 persons)	2,252,301	5.9	%
5% Stockholders			
FMR, LLC (12)	5,550,816	14.9	%
T. Rowe Price Associates, Inc. (13)	4,126,961	11.1	%
CHOP Foundation (14)	3,989,835	10.7	%

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Wellington Management Company, LLP (15)	3,780,420	10.1	%
BlackRock, Inc. (16)	2,650,258	7.1	%
The Vanguard Group (17)	2,577,279	6.9	%
JPMorgan Chase & Co (18)	2,239,459	6.0	%

* Less than 1%

Consists of (a) 293,354 shares of common stock and (b) 369,259 shares of common stock underlying options that (1) are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Mr. Marrazzo.

(2) Consists of (a) 211,459 shares of common stock and (b) 158,562 shares of common stock underlying options that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Dr. High.

43

- (3) Consists of (a) 3,615 shares of common stock and (b) 176,577 shares of common stock underlying options that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Mr. Webster.
- (4) Consists of (a) 1,121 shares of common stock and (b) 47,000 shares of common stock underlying options that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Mr. Faga.
- (5) Consists of (a) 6,640 shares of common stock, (b) 74,625 shares of common stock underlying options that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Mr. La Barge and (c) 200 shares held by Mr. La Barge's children, with respect to which Mr. La Barge disclaims beneficial ownership.
- Consists of (a) 18,333 shares of common stock owned by Dr. Altschuler, (b) 11,500 shares of common stock underlying options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Dr. Altschuler, and (b) 34,878 shares of common stock underlying options
- (6) that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date that were issued to Dr. Altschuler in his previous capacity as chief executive officer of the CHOP Foundation. Dr. Altschuler holds such options as a nominee of the CHOP Foundation, which shall receive any economic benefit associated with such option. Dr. Altschuler disclaims beneficial ownership of such options.
- (7) Consists of shares of common stock underlying options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date.
- Consists of 468,945 shares of common stock owned by Sofinnova Venture Partners VIII, L.P. ("SVP VIII") and (b) 48,703 shares of common stock under options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date owned by Dr. Mehra. Sofinnova Management VIII, L.L.C. ("SM VIII") is the general partner of SVP VIII and Anand Mehra, Michael Powell and James I. Healy, are the managing members of SM VIII (the Managing Members"). SVP VIII, SM VIII, SM VIII and the Managing Member may be deemed to have shared voting and dispositive power over the shares owned by SVP VIII. Such
- (8) persons and entities disclaim beneficial ownership over the shares owned by SVP VIII except to the extent of any pecuniary interest therein. The address of each such person or entity is Sofinnova Ventures, 3000 Sand Hill Road, Bldg. 4, Suite 250, Menlo Park, CA 94025. We obtained much of the information regarding beneficial ownership of these shares from a Schedule Form 4 that was filed with the SEC on July 26, 2017. Dr. Mehra is a managing member of Sofinnova Management VIII, L.L.C., the sole general partner of Sofinnova Venture Partners VIII, L.P. Dr. Mehra may be deemed to have voting and investment power over the shares held by Sofinnova Venture Partners VIII, L.P. Dr. Mehra disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein.
- (9) Consists of shares of common stock underlying options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date.
- Consists of (a) 11,214 shares of common stock owned by Dr. Sigal, (b) 31,559 shares of common stock owned by Sigal Family Investments, LLC and (c) 54,489 shares of common stock underlying options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date. Dr. Sigal
- (10) is a manager of Sigal Family Investments, LLC. Dr. Sigal may be deemed to have voting and investment power over the shares held by Sigal Family Investments, LLC. Dr. Sigal disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein.
- (11) Consists of shares of common stock underlying options and restricted stock units that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date.
- (12) All shares are held by FMR, LLC. Abigail P. Johnson is the chairman and chief executive officer of FMR LLC. Members of the Johnson family, including Abigail P. Johnson, are the predominant owners, directly or through trusts, of Series B voting common shares of FMR LLC representing 49% of the voting power of FMR LLC. The Johnson family group and all other Series B shareholders have entered into a shareholders' voting agreement under which all Series B voting common shares will be voted in accordance with the majority vote of Series B voting common shares. Accordingly, through their ownership of voting common shares and the execution of the shareholders' voting agreement, members of the Johnson family may be deemed, under the Investment Company Act of 1940, to form a controlling group with respect to FMR LLC. Neither FMR LLC nor Abigail P. Johnson

has the sole power to vote or direct the voting of the shares owned directly by the Fidelity Entities advised by Fidelity Management & Research Company, a wholly owned subsidiary of FMR LLC, which power resides with the Fidelity Entities' Boards of Trustees. Fidelity Management & Research Company carries out the voting of the shares under written guidelines established by the Fidelity Entities' Boards of Trustees. The address for FMR, LLC is 245 Summer Street, Boston, Massachusetts 02210. Beneficial ownership is derived from a Schedule 13G /A filed on February 13, 2018.

- (13) Based on information provided in the Schedule 13G/A filed on February 14, 2018. T. Rowe Price Associates, Inc. ("Price Associates") does not serve as custodian of the assets of any of its clients; accordingly, in each instance only the client or the client's custodian or trustee bank has the right to receive dividends paid with respect to, and proceeds from the sale of, such securities. The ultimate power to direct the receipt of dividends paid with respect to, and the proceeds from the sale of, such securities, is vested in the individual and institutional clients which Price Associates serves as investment adviser. Any and all discretionary authority which has been delegated to Price Associates may be revoked in whole or in part at any time. The address of Price Associates is 100 E. Pratt Street, Baltimore, MD 21202.

- (14) Consists of (a) 3,954,957 shares of common stock owned by the CHOP Foundation and (b) 34,878 shares of common stock underlying options that are exercisable as of April 9, 2018 or will become exercisable within 60 days after such date issued to Dr. Altschuler as a nominee of the CHOP Foundation. The CHOP Foundation's board of trustees, or a committee designated by the board of trustees, has voting and investment power of their shares. The address of the CHOP Foundation is 34th Civic Center Boulevard, Philadelphia, PA 19104. We obtained much of the information regarding beneficial ownership of these shares from a Schedule 13D that was filed with the SEC on March 9, 2018.

- (15) Based on information provided in the Schedule 13G filed on April 10, 2018. Wellington Management Group LLP, Wellington Group Holdings LLP and Wellington Investment Advisors Holdings LLP each have shared voting power with respect to 3,071,876 shares and shared dispositive power with respect to 3,780,420 shares. Wellington Management Company LLP, a Wellington Investment Advisor, has shared voting power with respect to 3,041,212 shares and shared dispositive power with respect to 3,663,871 shares. Wellington Management Group LLP, as parent holding company of certain holding companies and the Wellington Investment Advisors, are owned of record by clients of the Wellington Investment Advisors. Wellington Investment Advisors Holdings LLP controls directly, or indirectly through Wellington Management Global Holdings, Ltd., the Wellington Investment Advisors. Wellington Investment Advisors Holdings LLP is owned by Wellington Group Holdings LLP. Wellington Group Holdings LLP is owned by Wellington Management Group LLP. The address of Wellington Management Company LLP is 280 Congress Street, Boston, MA 02210.

- (16) The address for BlackRock, Inc. is 55 E 52nd Street, New York, NY 10055. Various persons have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of the common stock of the Company. No one person's interest in the common stock of the Company was more than five percent of the total outstanding common shares. Based on information provided in a Schedule 13G filed on January 23, 2018
- (17) The address for The Vanguard Group is 100 Vanguard Blvd, Malvern, PA 19355. Vanguard Fiduciary Trust Company, a wholly-owned subsidiary of The Vanguard Group, Inc., is the beneficial owner of 52,652 shares of the common stock of the Company as a result of its serving as investment manager of collective trust accounts and Vanguard Investments Australia, Ltd., a wholly-owned subsidiary of The Vanguard Group, Inc., is the beneficial owner of 8,332 shares of the common stock of the Company. Based on information provided in a Schedule 13G filed on February 12, 2018.

- (18) The address for JPMorgan Chase & Co is 270 Park Avenue, New York, New York 10017. Based on information provided in a Schedule 13G filed on January 11, 2018.

CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

During 2017, we have engaged in the following transactions with our directors, executive officers and holders of more than 5% of our voting securities and affiliates of our directors, executive officers and holders of more than 5% of our voting securities. We believe that all of the transactions described below were made on terms no less favorable to us than could have been obtained from unaffiliated third parties.

Ongoing collaboration with CHOP

In October 2013, we entered into a licensing agreement with CHOP, which we amended in December 2013, May 2014, December 2014 and October 2015. We also entered into a technology assignment agreement, a master research service agreement and an administrative services agreement with CHOP in October 2013, a sponsored research agreement with CHOP in October 2014 and multiple clinical trial agreements with CHOP at various times regarding the conduct of our various clinical trials. We also entered into an additional licensing agreement with CHOP in November 2015, which supplements our existing license agreement with CHOP by granting us a worldwide exclusive license, with the right to sublicense, to use and practice a provisional patent application related to the production of gene therapies. Pursuant to these agreements, we paid CHOP \$6.1 million during the year ended December 31, 2017. Steven M. Altschuler, M.D., chairman of our Board, previously served as the chief executive officer of CHOP and the CHOP Foundation.

Participation in follow-on offering

In our follow-on offering in August 2017, we offered 5,296,053 shares of common stock. Affiliates of FMR LLC, The Vanguard Group, T. Rowe Price Associates, Inc., Wellington Management Company, LLP, BlackRock Inc. and JPMorgan Chase & Co., who are all holders of more than 5% of our voting securities, purchased 690,789, 280,000, 354,371, 58,905, 20,000 and 350,000 shares, respectively, of our common stock in this offering through the underwriters at the offering price of \$76.00 per share. No other directors, executive officers or 5% stockholders or their affiliates purchased stock in this follow-on offering.

Indemnification arrangements

Our Restated Certificate of Incorporation provides that we will indemnify our directors and officers to the fullest extent permitted by Delaware law. In addition, we have entered into indemnification agreements with each of our directors and executive officers that may be broader in scope than the specific indemnification provisions contained in the DGCL. See the “Director Compensation—Limitation of liability and indemnification” section of this proxy for a further discussion of these arrangements.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Exchange Act requires our directors, executive officers and persons who own more than 10% of the Company's common stock to file with the SEC reports of ownership and changes in ownership of our common stock. Such persons are required by regulations of the SEC to furnish the Company with copies of all such filings. Based on our review of the reports we have received, the Company believes that all Section 16(a) filing requirements were complied with during the fiscal year ended December 31, 2017, except for two Forms 4 for Katherine High, the first of which was for transactions on August 29, 2017, and the second of which was for transactions on October 31, 2017, one Form 4 for John Furey for transactions on December 8, 2017, and December 11, 2017, for which he disclaims beneficial ownership and one Form 4 for Elliott Sigal for transactions on October 12, 2017 and November 28, 2017.

AUDIT COMMITTEE REPORT ⁽¹⁾

The Audit Committee has reviewed the Company's audited financial statements for the fiscal year ended December 31, 2017, and has discussed these statements with management and representatives of KPMG LLP, the Company's independent registered public accounting firm. Company management is responsible for the preparation of the Company's financial statements and for maintaining an adequate system of disclosure controls and procedures and internal control over financial reporting for that purpose. KPMG LLP is responsible for expressing an opinion on the conformity of the audited financial statements with generally accepted accounting principles, their judgments as to the

quality, not just the acceptability, of the Company's accounting principles and such other matters as are required to be discussed with the Audit Committee under generally accepted auditing standards. The Audit Committee is responsible for providing independent, objective oversight of the Company's accounting functions and internal controls.

The Audit Committee also received from, and discussed with, members of KPMG LLP the written disclosures and other communications that the Company's independent registered public accounting firm is required to provide to the Audit Committee, including the matters required to be discussed by AS 1301, Communication with Audit Committees, as adopted by the Public Company Accounting Oversight Board, or PCAOB. AS 1301 requires our independent registered public accounting firm to discuss with the Audit Committee, among other things, the following:

- methods to account for significant unusual transactions;
- the effect of significant accounting policies in controversial or emerging areas for which there is a lack of authoritative guidance or consensus;
- the process used by management in formulating particularly sensitive accounting estimates and the basis for the independent registered public accounting firm's conclusions regarding the reasonableness of those estimates; and
- disagreements with management regarding financial accounting and reporting matters and audit procedures.

KPMG LLP also provided the Audit Committee with the written disclosures and the letter required by Rule 3526 of the PCAOB. PCAOB Rule 3526 requires independent registered public accounting firms annually to disclose in writing all relationships that in their professional opinion may reasonably be thought to bear on independence, to confirm their perceived independence and engage in a discussion of independence. The Audit Committee has reviewed this disclosure and has discussed with members of KPMG LLP their independence from the Company. Based on its discussions with management and our independent registered public accounting firm, and its review of the representations and information provided by management and our independent registered public accounting firm, the Audit Committee recommended to the Board that the audited financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, for filing with the SEC.

Respectfully submitted by the
Audit Committee of the Board of Directors

Lota Zoth, CPA, Chair
Steven Altschuler, M.D.
Lars Ekman, M.D., Ph.D

This report is not "soliciting material," is not deemed filed with the SEC and is not to be incorporated by reference in (1) any filing of the Company under the Securities Act or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

PROPOSAL 3: RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The firm of KPMG LLP, independent registered public accounting firm, has been selected by the Audit Committee as auditors for the Company for the fiscal year ending December 31, 2018. KPMG LLP acted as the independent registered public accounting firm for the Company for the years ended December 31, 2014, December 31, 2015, December 31, 2016 and December 31, 2017. A representative of KPMG LLP is expected to be present at the Annual Meeting with the opportunity to make a statement if he or she or they desires and to respond to appropriate questions. The Company’s organizational documents do not require that the stockholders ratify the selection of KPMG LLP as the Company’s independent registered public accounting firm. The Company requests such ratification as a matter of good corporate practice. A majority of the votes properly cast is required for the approval of the ratification of the selection of KPMG LLP as our independent registered public accounting firm, and brokers, bankers and other nominees have discretionary voting power on this routine matter. Abstentions and broker non-votes will have no effect on the ratification. If the stockholders do not ratify the selection, the Audit Committee will reconsider whether to retain KPMG LLP, but still may retain this firm. Even if the selection is ratified, the Audit Committee, in its discretion, may change the appointment at any time during the year if it determines that such a change would be in the best interests of the Company and its stockholders.

The Audit Committee, or a designated member thereof, pre-approves each audit and non-audit service rendered by KPMG LLP to the Company.

AUDITOR'S FEES

The following table summarizes the fees of KPMG LLP, our independent registered public accounting firm, billed to us for each of the last two fiscal years.

Fee category	2016	2017
Audit fees (1)	\$745,000	\$805,000
Audit-related fees	—	—
Tax fees (2)	129,756	229,422
All other fees	—	5,000

Total fees \$874,756 \$1,039,422

(1) Audit fees consist of fees for the audit of our financial statements, the review of our interim financial statements and services associated with the issuance of comfort letters and the issuance of consents on registration statements.

(2) Tax fees consists of fees incurred for tax compliance, tax advice and tax planning and includes fees for tax return preparation and tax consulting.

The aggregate fees included in the Audit fees are billed for the fiscal year. The aggregate fees included in the Audit-related fees and Tax fees are fees billed in the fiscal year.

All such audit and non-audit services and fees were pre-approved by our Audit Committee in accordance with the “Pre-Approval Policies” described below.

Pre-approval policies

The Audit Committee of our Board has adopted policies and procedures for the pre-approval of audit and non-audit services for the purpose of maintaining the independence of our independent auditor. We may not engage our independent auditor to render any audit or non-audit service unless either the service is approved in advance by the Audit Committee, or the engagement to render the service is entered into pursuant to the Audit Committee’s pre-approval policies and procedures.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE FOR

THE RATIFICATION OF THE SELECTION OF KPMG LLP AS THE COMPANY’S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR THE FISCAL YEAR ENDING DECEMBER 31, 2018 (PROPOSAL 3 ON YOUR PROXY CARD)

POLICIES ON REPORTING OF CONCERNS REGARDING ACCOUNTING AND OTHER MATTERS AND ON COMMUNICATING WITH NON-MANAGEMENT DIRECTORS

The Board and the Audit Committee have adopted policies on reporting concerns regarding accounting and other matters and on communicating with the non-management directors. Any person, whether or not an employee, who has a concern about the conduct of the Company, or any of its people, including with respect to accounting, internal accounting controls or auditing matters, may, in a confidential or anonymous manner, communicate that concern to the Company's Chief Legal Officer, who is the designated contact for these purposes. Contact may be made: in writing (anonymity cannot be maintained), addressed to the General Counsel by U.S. mail to c/o Spark Therapeutics, Inc., 3737 Market Street, Suite 1300, Philadelphia, PA 19104; online at <http://compliance.sparktx.com/> (which may be done anonymously); or by phoning a voicemail account that we have established for receipt of questions and reports of potential violations of the code of business conduct and ethics. The voicemail account may be reached at 1-844-826-8149 and calls may be made anonymously. Any interested party, whether or not an employee, who wishes to communicate directly with the Audit Committee, also may contact the Audit Committee using one of the above methods.

Code of conduct and ethics

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions. We have posted on our website, www.sparktx.com, a current copy of the code and all disclosures that are required by law or NASDAQ stock market listing standards concerning any amendments to, or waivers from, any provision of the code.

WHERE YOU CAN FIND MORE INFORMATION

The Company files annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any reports, statements, or other information that Company files at the SEC's public reference room at the following location: 100 F Street, N.E., Washington, D.C. 20549.

Please call the SEC at 1-800-732-0330 for further information on the public reference room. The Company's SEC filings are also available to the public from commercial document retrieval services and at the website maintained by the SEC at www.sec.gov. You may also read and copy any document the Company files with the SEC on our website at www.sparktx.com under the "Investors" menu.

You should rely on the information contained in this document to vote your shares at the Annual Meeting. The Company has not authorized anyone to provide you with information that is different from what is contained in this document. This document is dated April 20, 2018. You should not assume that the information contained in this document is accurate as of any date other than that date, and the mailing of this document to stockholders at any time after that date does not create an implication to the contrary. This Proxy Statement does not constitute a solicitation of a proxy in any jurisdiction where, or to or from any person to whom, it is unlawful to make such proxy solicitations in such jurisdiction.

FORM 10-K

We are subject to the informational requirements of the Exchange Act and, in accordance therewith, file reports, proxy statements and other information with the SEC. Reports, proxy statements and other information filed by us may be inspected without charge and copies obtained upon payment of prescribed fees from the Public Reference Section of the SEC at 100 F Street, NE, Washington, D.C. 20549, or by way of the SEC's website, www.sec.gov.

We will provide without charge to each person to whom a copy of the Proxy Statement is delivered, upon the written or oral request of any such persons, additional copies of our Annual Report on Form 10-K, for the fiscal year ended December 31, 2017 as filed with the SEC. Requests for such copies should be addressed to:

Spark Therapeutics, Inc.
3737 Market Street
Suite 1300
Philadelphia, PA 19104
(855) 772-7589

Attention: Joseph W. La Barge, Secretary

48

HOUSEHOLDING OF ANNUAL MEETING MATERIALS

Stockholders of the Company's common stock who share a single address may receive only one copy of this Proxy Statement, Notice of Internet Availability and our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, unless the Company has received contrary instructions from any stockholder at that address. This practice, known as "householding," is designed to reduce the Company's printing and postage costs. However, if any stockholder residing at such an address wishes to receive a separate copy of this Proxy Statement, Notice of Internet Availability or our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, he or she may contact Spark Therapeutics, Inc., 3737 Market Street, Suite 1300, Philadelphia, PA 19104, (855) 772-7589, Attention: Joseph W. La Barge, Secretary, and the Company will deliver those documents to such stockholder promptly upon receiving the request. Any such stockholder may also contact Joseph W. La Barge, Secretary, using the above contact information if he or she would like to receive separate proxy statements, notice of internet availability and annual reports in the future. If you are receiving multiple copies of our annual reports, notice of internet availability and proxy statements, you may request householding in the future by contacting Joseph W. La Barge, Secretary.

OTHER BUSINESS

The Board knows of no business to be brought before the Annual Meeting which is not referred to in the accompanying Notice of Annual Meeting. Should any such matters be presented, the persons named in the proxy shall have the authority to take such action in regard to such matters as in their judgment seems advisable. If you hold shares through a broker, bank or other nominee as described above, they will not be able to vote your shares on any other business that comes before the Annual Meeting unless they receive instructions from you with respect to such matter.

