

Spark Therapeutics, Inc.  
Form DEF 14A  
April 21, 2017

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

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SCHEDULE 14A  
Proxy Statement Pursuant to Section 14(a) of the  
Securities Exchange Act of 1934

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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)

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- 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:
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- (1) Amount Previously Paid:
  - (2) Form, Schedule or Registration Statement No.:
  - (3) Filing Party:
  - (4) Date Filed:
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April 21, 2017

Dear Stockholder:

You are cordially invited to attend the 2017 Annual Meeting of Stockholders, or Annual Meeting, of Spark Therapeutics, Inc., or the Company or Spark. The meeting will be held on May 31, 2017 at 8:30 a.m. Eastern Daylight Time, or EDT, at the offices of Ballard Spahr LLP, located at 1735 Market Street, 48th Floor, Philadelphia, PA 19103. 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 II directors for a three (3) year term, the approval, by non-binding vote, of executive compensation and the recommendation, by non-binding vote, of the frequency of future non-binding advisory votes on 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, 2017.

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](http://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 2017 ANNUAL MEETING OF STOCKHOLDERS

- Time** 8:30 a.m., EDT
- Date** May 31, 2017
- Place** The offices of Ballard Spahr LLP, 1735 Market Street, 48th Floor, Philadelphia, PA 19103.
- Purpose**
1. To elect Steven M. Altschuler, M.D., Lars G. Ekman, M.D., and Katherine A. High, M.D., as Class II 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 hold an advisory vote to determine the frequency of future stockholder advisory votes on the compensation paid to the Company's named executive officers;
  4. To ratify the selection of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017; and
  5. 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 11, 2017, 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 21, 2017

Important notice regarding the availability of proxy materials for the Spark Therapeutics, Inc. 2017 Annual Meeting of Stockholders to be held on May 31, 2017: The Notice of 2017 Annual Meeting of Stockholders, proxy statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2016 are available at [www.sparktx.com](http://www.sparktx.com)

by following the link for “Investors”. To obtain directions to the Ballard Spahr offices in order to attend the Annual Meeting in person, please visit the “Investors - Events” section of our website at [www.sparktx.com](http://www.sparktx.com) or contact Investor Relations at (855) 772-7589.

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SPARK THERAPEUTICS, INC.  
3737 MARKET STREET  
SUITE 1300  
PHILADELPHIA, PA 19104  
PROXY STATEMENT  
FOR THE 2017 ANNUAL MEETING OF STOCKHOLDERS  
TO BE HELD ON MAY 31, 2017  
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 21, 2017, 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 2017 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, 2016 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 21, 2017. 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 11, 2017.

How many votes can be cast by all stockholders?

A total of 31,092,670 shares of common stock of the Company were outstanding on April 11, 2017 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](http://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 II director nominees named herein to the Board, FOR the advisory resolution approving the compensation of the named executive officers, FOR holding an advisory vote on the compensation of the Company's named executive officers EVERY YEAR and FOR the ratification of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017, 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 of Directors recommends a vote:

Proposal 1: FOR election of the three Class II directors (page 5)

Proposal 2: FOR the advisory resolution approving the compensation of the Company's named executive officers (page 15)

Proposal 3: FOR holding an advisory vote on the compensation of the Company's named executive officers EVERY YEAR (page 16)

Proposal 4: FOR ratification of the selection of KPMG LLP as the Company's independent registered public accounting firm (page 45)

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, bankers 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 "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 4, 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 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 II director nominees**

The three nominees for election as Class II 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**

For the advisory vote on executive compensation, a majority of the the votes cast FOR is necessary to approve, on an advisory basis, the compensation of our named executive officers. Only FOR and AGAINST votes will affect the outcome. Abstentions will have no effect on the voting of Proposal 2. Proposal 2 is a non-routine matter.

**Proposal 3 - Advisory vote on frequency of advisory vote on executive compensation**

For the advisory vote on the frequency of the advisory vote on executive compensation, a plurality of votes cast is necessary for the approval of the advisory vote on the frequency of advisory votes on the compensation of the Company's named executive officers. This means that the option that receives the most votes will be recommended by the stockholders to the Board. Abstentions will have no effect on the voting of Proposal 3. Proposal 3 is a non-routine matter.

**Proposal 4 - Ratification of selection of KPMG LLP as our independent registered public accounting firm**

A majority of votes cast is necessary for ratification of the selection of KPMG LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017. Proposal 4 is a routine matter.

**PROPOSAL 1: ELECTION OF CLASS II 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. Steven M. Altschuler, M.D., Lars G. Ekman, M.D., and Katherine A. High, M.D., are the directors whose terms expire at this Annual Meeting and each of Drs. Altschuler, Ekman and High has been nominated for and has agreed to stand for re-election to the Board to serve as a Class II 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 II 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 II DIRECTOR  
(PROPOSAL 1 ON YOUR PROXY CARD)**

Steven M. Altschuler, M.D.

Lars G. Ekman, M.D.

Katherine A. High, M.D.

## DIRECTOR BIOGRAPHIES

The following table sets forth information concerning each member of our Board of Directors as of April 11, 2017. The biographical description of each director includes the specific experience, qualifications, attributes and skills that the Board of Directors 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	38	Chief Executive Officer and Director
Katherine A. High, M.D. (4)	65	President, Chief Scientific Officer and Director
Steven M. Altschuler, M.D. (2) (3)	63	Chairman of the Board of Directors
A. Lorrin Betz, M.D., Ph.D.	70	Director
Lars G. Ekman, M.D., Ph.D. (1) (3) (4)	67	Director
Anand Mehra, M.D. (1) (4)	41	Director
Vincent J. Milano (2)	53	Director
Elliott Sigal, M.D., Ph.D. (2) (3) (4)	65	Director
Lota Zoth, CPA (1)	57	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 Spark and as a member of our Board since our founding in 2013. Prior to founding Spark, Mr. Marrazzo launched and was Chief Business Officer of the U.S. division of Molecular Health, Inc. from 2011 to 2013. Mr. Marrazzo was part of the founding management of Generation Health from 2009 to 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 2011 to 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 co-founder and Chief Executive Officer.

### Katherine A. High, M.D.

Dr. Katherine A. High has served as our President and Chief Scientific Officer and a member of our Board since September 2014. 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. Dr. High was previously a Professor at the Perelman School of Medicine at the University of Pennsylvania and an Investigator of the Howard Hughes Medical Institute. She served as the Director of the Center for Cellular and Molecular Therapeutics at CHOP from 2004 to 2014, where her team’s research led to the discovery of new gene and cell therapies for genetic diseases. 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 AAV vectors in a variety of target tissues. Dr. High served a five-year term from 2000 to 2005 on the FDA 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, 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 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 served as the Senior Vice President of Health Affairs at the University of Miami and Chief Executive Officer of UHealth-University of Miami Health System since January 2016. Previously, he was Chief Executive Officer of CHOP and The Children's Hospital of Philadelphia Foundation, or the CHOP Foundation, from 2000 to 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 has served on the board of directors for Mead Johnson Nutrition Company since 2009 and is currently chair of the Compensation Committee and serves 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.

A. Lorris Betz, M.D., Ph.D.

Dr. A. Lorris Betz has served on our Board since January 2015. Dr. Betz served as Senior Vice President for Health Sciences and Dean of the School of Medicine at The University of Utah, where he also was a faculty member, and as Chief Executive Officer of the University of Utah Health Care, from 1999 to 2011. Dr. Betz also served twice as the Interim President of the University of Utah from January 2004 to August 2004 and from May 2011 to March 2012. Dr. Betz previously held various faculty positions at the University of Michigan from 1979 to 1998. Dr. Betz has served on the board of directors of the Association of Medical Colleges since 2012, including as Chairman from 2013 to 2014, and currently serves as a member of the Board of Trustees and Executive Committee of CHOP and the CHOP Foundation. Dr. Betz holds a B.S., M.D. and Ph. D. in biochemistry and physiology from the University of Wisconsin. He completed his pediatric residency and a research fellowship in pediatric neurology at the University of California, San Francisco. We believe that Dr. Betz is qualified to serve on our Board because of his extensive experience in medicine and the medical industry and his extensive leadership experience.

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

Dr. Lars Ekman has served on our Board since May 2014. He is currently Executive Partner at Sofinnova Ventures which he joined in 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 is Chairman of Amarin Corporation, Poseida Therapeutics, Inc., Prothena Biosciences Inc. and Sophiris Bio, Corp. He also serves on the board of directors of Ultragenyx Pharmaceutical Inc. He co-founded and served as Chief Executive Officer of Cebix, Inc., and served on its board from 2009 to 2015 as well as on the board of directors of InterMune, Inc. from 2006-2015, Elan Plc from 2005-2013 and Ocera Therapeutics, Inc. from 2009-2015. 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 is currently a General Partner of Sofinnova Ventures, which he joined in 2007. Prior to joining Sofinnova, 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 has previously served on the board of directors of Aerie Pharmaceuticals and Marinus Pharmaceuticals. He currently serves on the board of Aclaris Therapeutics, Inc. and Merus B.V., 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 is currently the Chief Executive Officer of Idera Pharmaceuticals Inc. 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 2008 to 2014, which was acquired by Shire Pharmaceuticals,

Inc. in January 2014. Mr. Milano joined ViroPharma in 1996 and served as Vice President, Chief Financial Officer and Treasurer from 1997 to 2006. 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.

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 2004 until his retirement in 2013 and was a member of the board of directors from 2011 to 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 2001-2013. 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 and the Mead Johnson Nutrition Company. 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. 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 for MedImmune Inc., or Medimmune, before 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., Aeras, Circassia Pharmaceuticals, PLC and NewLink Genetics Corporation. 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.

#### HOW OUR BOARD IS ORGANIZED

##### Composition of the Board of Directors

Our Board of Directors 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 Drs. Betz and Mehra and Ms. Zoth and their term expires at the annual meeting of stockholders to be held in 2019;

• the Class II directors are Drs. Altschuler, Ekman and High and their term expires at the 2017 Annual Meeting; and

• the Class III directors are Messrs. Marrazzo and Milano and Dr. Sigal and their term expires at the annual meeting of stockholders to be held in 2018.

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 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 2017, 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. Ekman and Mehra, who comprise our Audit Committee, Mr. Milano and Drs. Altschuler and Sigal, who comprise our Compensation Committee, and Drs. Ekman, Altschuler and Sigal, 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](http://www.sparktx.com).

#### Audit Committee

The members of our Audit Committee are Ms. Zoth and Drs. Ekman and Mehra. Ms. Zoth is the chair of the Audit Committee as of January 6, 2016, prior to which Mr. Milano was the chair of the Audit Committee. During the fiscal year ended December 31, 2016, the Audit Committee met six 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;
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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.

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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 Mr. Milano and Drs. Altschuler and Sigal. Mr. Milano is the chair of the Compensation Committee. During the fiscal year ended December 31, 2016, 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” if and when we are required to have such disclosure under SEC rules; 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 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 2016, 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 2016. 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 2016, 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. Dr. Ekman is the chair of the Nominating and Corporate Governance Committee. During the fiscal year ended December 31, 2016, the

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Nominating and Corporate Governance Committee met five 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. High, Ekman, Mehra and Sigal. Dr. High is the chair of the Science and Technology Committee. During fiscal year ended December 31, 2016, the science and technology committee met four times. 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, 2016. 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 is, or has ever been, an officer or employee of our Company.

#### BOARD MEETINGS AND ATTENDANCE

Our Board held eight meetings during the fiscal year ended December 31, 2016. 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, 2016 (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). Spark encourages its directors to attend the Annual Meeting of Stockholders. All members of the Board attended the 2016 annual meeting of the stockholders. Mr. Marrazzo and Dr. High attended the 2016 Annual Meeting of the stockholders in person. The rest of the Board attended via teleconference. 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, 2016.

#### BOARD PROCESSES

##### Identifying and evaluating director nominees

Our Board is responsible for selecting its own members. The Board delegates the selection and nomination process to the Nominating and Corporate Governance Committee, with the expectation that other members of the Board, and of management, will be requested to take part in the process as appropriate.

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

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Governance Committee deems to be appropriate in the evaluation process. The Nominating and Corporate Governance Committee then meets as a group 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. The nominee shall have the highest personal and professional integrity, shall have demonstrated exceptional ability and judgment, and shall be most effective, in conjunction with the other nominees to the Board, in collectively serving 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, and is 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 general counsel, 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.

#### Communication with stockholders

Our Board 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](http://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,

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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 general counsel. 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 2018, or the 2018 Annual Meeting, may do so by following the procedures prescribed in Rule 14a-8 under the Securities Exchange Act of 1934 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 2018 Annual Meeting made under Rule 14a-8 by December 22, 2017.

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

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notice is timely given and if the notice contains the information required by the Bylaws. To be timely, a notice with respect to the 2018 Annual Meeting must be delivered to our Secretary no earlier than January 31, 2018, and no later than March 2, 2018.

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 2017 Annual Meeting of Stockholders pursuant to the compensation disclosure rules of the Securities and Exchange Commission, 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)**

**PROPOSAL 3: ADVISORY VOTE ON THE FREQUENCY OF ADVISORY VOTES ON EXECUTIVE COMPENSATION**

As part of the Board's commitment to excellence in corporate governance, and as required by Section 14A(a)(2) of the Exchange Act, the Board is providing the Company's stockholders with an opportunity to provide an advisory vote to determine whether the stockholder vote on the compensation of the Company's named executive officers should occur every one, two or three years.

Our Board intends to consider carefully the outcome of this vote in making a determination about the frequency of future executive compensation advisory votes. However, because this vote is advisory and non-binding, the Board may decide that it is in the best interests of our stockholders and the Company to hold the advisory vote to approve executive compensation more or less frequently, but no less frequently than once every three years, as required by the Exchange Act. In the future, we will propose an advisory vote on the frequency of the executive compensation advisory vote at least once every six calendar years as required by the Exchange Act.

After careful consideration, the Board believes that an executive compensation advisory vote should be held every year, and therefore our Board recommends that you vote for a frequency of every ONE YEAR for future executive compensation advisory votes.

The Board believes that an annual executive compensation advisory vote will facilitate more direct stockholder input about executive compensation. An annual executive compensation advisory vote is consistent with our policy of reviewing our compensation program annually, as well as seeking frequent input from our stockholders on corporate governance and executive compensation matters. We believe an annual vote would be the best governance practice for our Company at this time.

**THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE TO HOLD THE ADVISORY VOTE ON EXECUTIVE COMPENSATION EVERY YEAR (PROPOSAL 3 ON YOUR PROXY CARD)**

## EXECUTIVE OFFICER AND DIRECTOR COMPENSATION

## Executive officers

The following table sets forth information regarding our executive officers, as of April 11, 2017:

NAME	Age	Position
Jeffrey D. Marrazzo (1)	38	Chief Executive Officer
Katherine A. High, M.D. (2)	65	President and Chief Scientific Officer
Stephen W. Webster	56	Chief Financial Officer
Daniel R. Faga	37	Chief Business Officer
John P. Furey	52	Chief Operating Officer
Joseph W. La Barge	45	General Counsel

(1) Mr. Marrazzo also is a director of the Company and his biographical information appears on page 6.

(2) Dr. High also is a director of the Company and her biographical information appears on page 6.

**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.

**Daniel R. Faga.** Mr. Faga has served as our Chief Business Officer since May 2016. From 2009-2016, Mr. Faga was a Managing Director at Centerview Partners, where he had served as a founding member of Centerview's healthcare advisory practice. Primarily focused in the life sciences sector, Mr. Faga has deep expertise in corporate strategy, M&A and partnering, including advising on more than \$50 billion in biopharma transactions. 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 July 2015 to June 2016, Mr. Furey was Senior Vice President and Head of Global Operations for Baxalta, where he directed manufacturing, quality, engineering, and process development. Mr. Furey actively managed a \$2.5 billion production budget across Baxalta's global network and led a first-in-class supply chain organization for rare diseases. He led the team that coordinated and delivered the successful establishment of Baxalta through a spin out from Baxter and led the Baxter Vaccine inline business to realize significant top line and bottom line growth. He also spent two years in China as General Manager of Pfizer's vaccine business unit following a role with responsibility for global pricing and reimbursement at Pfizer Vaccines. In these roles, Mr. Furey gained extensive experience in pipeline development and global product launches. 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 General Counsel since November 2013. Prior to joining Spark, 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. Mr. La Barge holds a B.A. from Bucknell University and a J.D. from Temple University.

Compensation discussion and analysis

The Compensation Committee of our Board is responsible for establishing compensation policies with respect to our "named executive officers", or NEOs, which include our chief executive officer, chief financial officer and three other executive officers who are listed in the Summary Compensation table on page 27. Our named executive officers as of the

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end of our last completed fiscal year on December 31, 2016, were Mr. Marrazzo, Dr. High, Mr. Webster, Mr. Faga and Mr. Furey.

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

Prior to December 31, 2016, we were considered an "emerging growth company" under applicable federal securities law and as a result we did not hold a say-on-pay-vote at our prior annual meeting.

This proxy statement marks the first time we are seeking approval, on an advisory basis, of the compensation of our named executive officers and the frequency with which such votes must be conducted. As such, this Compensation Discussion and Analysis, and the related executive compensation tables, are intended to provide a detailed summary of our executive compensation programs.

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. Our product candidates 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 2016, we made significant progress toward our clinical development and business goals, including the following, which impacted executive compensation:

- maintained a strong safety track record in clinical development of all product candidates.
- substantially advanced our lead product candidate, voretigene neparovec, toward Biologics License Application (BLA) submission, including completion of non-clinical modules, significant advancement of assay development and CMC processes, and presented additional long-term follow up data suggesting consistent and sustained durable effect.
- demonstrated initial proof-of-concept in our SPK-FIX program for hemophilia B and received breakthrough therapy designation from the FDA for SPK-9001, the lead product candidate in the SPK-FIX program.
- initiated the ID Your IRD program to facilitate genetic testing in the U.S. and in certain other countries.
- had the Investigational New Drug Application (IND) cleared by the FDA for SPK-8011, our lead product candidate for hemophilia A.
- validated our gene therapy technology platform across two tissue types, with clinical-stage programs targeting delivery to the eye and liver.
- substantially built-out commercial and medical affairs organizations in advance of potential launch of voretigene neparovec.
- completed an equity financing with approximately \$128 million in net proceeds to us.
- entered into an exclusive license with Selecta Biosciences, Inc. to access Selecta's proprietary immune tolerance platform technology for co-administration with gene therapy targets, including factor VIII for hemophilia A, as well as exclusive options for up to four additional liver-directed gene therapy targets.
- managed operating expenses according to the Board-approved budget and managed organizational growth according to the Board-approved hiring plan while optimizing the structure and talent to scale a fully-integrated company.

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 executives' interests with those of stockholders through long-term incentives linked to individual 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 incentive compensation	To encourage executives and other employees to focus on long-term company performance; to facilitate retention; to reward outstanding company and individual performance.	Typically, subject to multi-year vesting based on continued service primarily in the form of stock options and restricted 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**

- Maintain an industry-specific peer group for benchmarking pay
- Target pay based on market norms
- Deliver compensation primarily through performance-based pay
- Offer market-competitive benefits that are consistent with our Company-wide compensation strategy
- Consult with an independent advisor on compensation levels and practices

**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 2016, 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 standards. 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 whose number of employees, market capitalization and stage of development are comparable;
- companies against which we compete for executive talent; and
- public companies headquartered in the U.S. for which compensation data are available.

**What We Don't Do**

- Allow hedging or pledging of equity
- Re-price stock options
- Provide excessive perquisites
- Provide tax gross-up payments for any change-of-control payments

Based on these criteria, the Compensation Committee approved the following peer group of 22 companies in 2015. This peer group remained unchanged in 2016, and is referred to as our "2016 Compensation Peer Group".

Aduro BioTech	Dynavax Technologies	NewLink Genetics
Alder Biopharmaceuticals	Exelixis	Ophthotech
Amicus Therapeutics	Halozyme Therapeutics	Portola Pharmaceuticals
BioCryst Pharmaceuticals	Heron Therapeutics	PTC Therapeutics
bluebird bio	Insmed	Sarepta Therapeutics
Celldex Therapeutics	Kite Pharma	Tesaro
Chimerix	MacroGenics	
Coherus Biosciences	Momenta Pharmaceuticals	

We believe that reviewing the compensation level and practices of our 2016 Compensation Peer Group, in addition to the compensation survey data highlighted below, provided the Compensation Committee with appropriate market references, for evaluating named executive officer compensation.

For the purposes of informing 2017 decisions, the Compensation Committee, with the advice of Willis Towers Watson, examined our peer group in light of the following factors:

- our growth in 2016, which is anticipated to continue throughout 2017,
- the stage of development of our clinical programs, and
- changes in our market capitalization.

Following this review, we modified the peer group to remove companies whose market capitalization and/or number of employees were below our targeted range. We also added some companies based on other key business metrics. Our peer group for 2017, or the "2017 Compensation Peer Group," was approved by our Compensation Committee and is comprised of the following 21 companies:

ACADIA Pharmaceuticals	Halozyme Therapeutics	Neurocrine Biosciences
Aduro BioTech	Heron Therapeutics	Ophthotech
Alder Biopharmaceuticals	Insmed	Portola Pharmaceuticals
Amicus Therapeutics	Juno Therapeutics	Sage Therapeutics
bluebird bio	Kite Pharma	Sarepta Therapeutics
Coherus Biosciences	MacroGenics	Tesaro
Exelixis	Momenta Pharmaceuticals	Ultragenyx Pharmaceutical

Additionally, we utilize multiple compensation surveys in setting 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, or CDB.
- Other key factors in determining executive compensation

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

- key R&D 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 domestic and international 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 and scope of duties and responsibilities.

In order to accomplish its objectives consistent with its philosophy for executive compensation, our Compensation Committee typically takes the following actions annually:

- reviews chief executive officer performance;
- seeks input from our chief executive officer on the performance of all other executive officers;
- reviews all components of executive officer compensation, including base salary, cash bonus targets and awards, equity compensation 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 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. The individual performance goals for the chief executive officer largely are coextensive with the corporate goals.

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 2016, these were granted in the first quarter of 2017.

#### 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 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 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 2017, 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 2017 Compensation Peer Group and relevant compensation survey data, to increase his annual base salary to from \$525,000 to \$565,000.

At the beginning of 2017, our Compensation Committee approved base salary increases for each of our remaining named executive officers, based upon each executive officer's achievement of individual goals and the comparison to the base salary of similar executive in our peer group and in relevant compensation survey data. The table below sets forth the adjustments to base salary for each of our named executive officers:

2017 Base Salary Increases

Executive Officer	2016 Base Salary	2017 Base Salary
Jeffrey	<del>\$525,000</del>	\$565,000
Marrazzo		
Katherine		
A High, M.D.	\$415,000	\$450,000
Stephen	<del>\$400,000</del>	\$415,000
Webster		
Daniel	<del>\$400,000</del>	\$410,000
(1)		
John		
P Furey	\$450,000	\$450,000
(2)		

(1) Mr. Faga's base salary adjustment was prorated based on his employment start date in May 2016.

(2) Mr. Furey's base salary was not adjusted because of his employment start date in December 2016.

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 2017, our Compensation Committee approved the 2016 annual incentive program payment pool, including the opportunity for eligible participants to achieve incentive awards above established bonus targets based on performance relative to Spark's five 2016 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 for 2016. 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 the corporate objectives for 2016, and the corresponding highlights and accomplishments related to each.

Primary corporate objectives	Key highlights and accomplishments
Execute the global registration plan for voretigene neparovec	<ul style="list-style-type: none"> <li>üAdvanced and completed substantial portions of the BLA as part of a rolling submission process.</li> <li>üSuccessfully obtained amendment to orphan product designation to cover inherited retinal diseases caused by biallelic RPE65 mutations.</li> </ul>
Execute the launch readiness plan for voretigene neparovec with a focus on framing potential product value	<ul style="list-style-type: none"> <li>üPresented additional data demonstrating potential long-term durable effect of voretigene neparovec.</li> <li>üContinued substantial build-out of infrastructure to support commercial launch of voretigene neparovec.</li> <li>üMaintained strong safety track record in clinical development of all product candidates.</li> </ul>
Advance our product portfolio by demonstrating human proof-of-concept in new indications and expand our clinical pipeline by additional indications	<ul style="list-style-type: none"> <li>üValidated technology platform in second tissue type, with product candidates now for the eye and liver.</li> <li>üFiled IND with the FDA in hemophilia A.</li> <li>üDemonstrated initial proof of concept of SPK-FIX hemophilia B program.</li> <li>üAdvanced SPK-CHM Phase 1/2 clinical trial with a targeted read-out of initial clinical data in early 2017.</li> <li>üReceived breakthrough therapy designation from the FDA for SPK-9001 in hemophilia B.</li> </ul>
Strengthen platform technology and capabilities to support our vision and pipeline	<ul style="list-style-type: none"> <li>üDeveloped novel capsid engineering capabilities internally as well as collaborating externally on capsid biology and engineering.</li> <li>üEntered into an exclusive license with Selecta Biosciences to access Selecta’s proprietary immune tolerance platform technology for co-administration with gene therapy targets.</li> <li>üManaged operating expenses according to Board-approved budget.</li> </ul>
Effectively grow and design the organization to efficient scale to meet global commercialization and product portfolio expansion goals	<ul style="list-style-type: none"> <li>üCompleted an equity financing with approximately \$128 million in net proceeds to Company.</li> <li>üManaged organizational growth according to Board-approved hiring plan while optimizing the structure and talent to scale a fully-integrated company.</li> </ul>
Advance the understanding and accessibility of genetic testing for IRDs.	<ul style="list-style-type: none"> <li>üInitiated ID Your IRD program and facilitated genetic testing in U.S. and in certain other countries.</li> </ul>

Based upon the above achievements, the Compensation Committee determined to use a corporate performance modifier of 120% for the 2016 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;  
enhanced and implemented Spark's mission, vision and shared values.

Dr. High:

continued to build organizational capabilities;  
progressed the global registration for voretigene neparvovec;  
advanced our product 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; and  
executed follow-on financing with \$128 million in net proceeds to Company.

Mr. Faga:

- continued to build organizational capabilities;
- executed various in-licensing transactions, including Selecta Biosciences agreement; and
- managed our Pfizer collaboration.

Mr. Furey was not eligible for participation in our year-end compensation program as a result of his employment start date in December 2016.

The table below shows the target award under the incentive program as a percentage of each named executive officer's 2016 base salary and the actual cash bonus payments to our named executive officers for 2016 performance, which were paid in the first quarter of 2017.

#### 2016 Annual Incentive Payouts

Name	2016 Target (% of Salary)	2016 Target (\$ Value)	Corporate Performance Modifier	Individual Performance Modifier	2016 Actual Bonus	2016 Bonus (% of Target)
Jeffrey D. Marrazzo	60 %	\$315,000	120%	115%	\$435,000	138%
Katherine A. High, M.D.	45 %	\$186,750	120%	116%	\$260,000	139%
Stephen W. Webster	40 %	\$160,000	120%	112%	\$215,000	134%
Daniel Faga <sup>(1)</sup>	40 %	\$106,520	120%	117%	\$150,000	141%

(1) Mr. Faga's award opportunity and actual award payment were prorated based on his employment start date in May 2016.

#### Target cash incentive compensation for our named executive officers in 2017

The terms of the 2017 program are substantially the same as the 2016 program. The 2017 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 2017 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 2017 base salary, as well as the target annual incentive award opportunity in dollars for 2017.

#### 2017 Target Annual Incentives

Name	2017 Target (% of Salary)	2017 Target (\$ Value)
Jeffrey D. Marrazzo	60%	\$339,000
Katherine A. High, M.D.	45%	\$202,500
Stephen Webster	40%	\$166,000
Daniel Faga	40%	\$164,000
John Furey	40%	\$180,000

#### 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 share 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.

Historically, our equity awards have taken the form of stock options. We typically granted stock options to each executive officer upon commencement of employment and annually in conjunction with our review of individual

performance. For 2017

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grants, we modified our strategy to incorporate the use of time-based restricted stock units in order to promote long-term retention. In 2017, the mix of equity awards for our named executive officers continues to be more heavily weighted towards options than restricted stock units (70% options; 30% restricted stock units).

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 granted have exercise prices 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 Spark. All stock options have a ten-year term. Stock options granted in 2016 vest 25% after one year then quarterly over the remaining three years. Beginning in 2017, stock options and restricted stock units will vest annually over a four-year period. This move from quarterly to annual vesting provides a longer-term orientation and supports stock holding for executives. 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 stock option holder does not have any rights as a stockholder with respect to the shares subject to such stock option.

In connection with the annual review of each executive officer's individual performance and consistent with our compensation philosophy, in January 2017, our Compensation Committee approved annual equity incentive awards for our named executive officers. The January 2017 equity awards granted to our named executive officers are set forth in the table below:

#### 2017 Annual Equity Incentive

Name	Stock options (#)	Restricted stock units (#)
Jeffrey D. Marrazzo	70,000	20,000
Katherine A. High, M.D.	31,500	9,000
Stephen W. Webster	25,000	7,000
Daniel Faga	28,000	8,000

Mr. Furey was not eligible for an annual grant in January 2017 due to the fact that his employment began in December 2016.

Although we do not have a formal policy with respect to the grant of equity incentive awards to our named executive officers, or any formal equity ownership guidelines applicable to them, we believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. In addition, we believe that equity grants with a time-based vesting feature promote executive retention because this feature incentivizes our executives to remain in our employment during the vesting period. Accordingly, our Board of Directors 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 adopted, and 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

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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 2016, 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 are 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 2016, and have the amount of the reduction contributed to the 401(k) plan. Participants who are at least 50 years old also could make “catch-up” contributions, which in 2016 may be up to an additional \$5,500 above the statutory limit. We also made discretionary matching contributions to our 401(k) plan equal to 50% of the employee contributions up to 6% of the employee’s salary, subject to the statutorily prescribed limit, equal to \$18,000 in 2016. The match immediately vests in full. In addition to the discretionary matching contributions, we made a safe harbor contribution in an amount equal to 3% of eligible compensation, subject to a maximum compensation of \$265,000, which 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, generally disallows a tax deduction to public companies for compensation in excess of \$1 million per person paid to a company’s chief executive officer and its three other officers (other than the chief/principal financial officer) whose compensation is required to be disclosed to stockholders pursuant to the Exchange Act by reason of being among the company’s most highly compensated officers. Qualified performance-based compensation is not subject to the deduction limitation if specified requirements are met. We periodically review the potential effects of Section 162(m) and we consider whether to structure the performance-based portion of our executive compensation to comply with exemptions in Section 162(m), so that the compensation remains tax deductible to us. However, our Compensation Committee may, in its judgment, authorize compensation payments that do not comply with the exemptions in Section 162(m) when it believes that such payments are appropriate to attract, motivate and retain executive talent and are in our best interest and that of our stockholders.

#### 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.

#### 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 of Directors 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, 2016, which was filed with the SEC on February 28, 2017.

By the Compensation Committee of the Board of Directors of Spark,

Vincent Milano, Chairman  
Steven M. Altschuler, M.D.  
Elliott Sigal, M.D., Ph.D.

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## 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, 2014, 2015 and 2016.

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	2016	\$526,731(4)	\$3,575,667	\$ 435,000	\$ 38,056	\$4,575,454
	2015	\$447,039(5)	\$5,670,479	\$ 300,000	\$ 72,343	\$6,489,861
	2014	\$349,604(6)	\$1,128,401	\$ 146,301	\$ 40,509	\$1,664,815
Katherine A. High, M.D. President and Chief Scientific Officer	2016	\$416,558(7)	\$1,456,637	\$ 260,000	\$ 27,976	\$2,161,171
	2015	\$403,558(8)	\$3,175,603	\$ 230,000	\$ 17,835	\$3,826,996
	2014	\$108,538(9)	\$408,701	\$ 45,896	\$ 8,169	\$571,304
Stephen W. Webster Chief Financial Officer	2016	\$401,346(10)	\$1,456,637	\$ 215,000	\$ 38,642	\$2,111,625
	2015	\$348,280(11)	\$2,720,941	\$ 221,000	\$ 38,001	\$3,328,222
	2014	\$147,528(12)	\$481,494	\$ 52,500	\$ 12,861	\$694,383
Daniel R. Faga Chief Business Officer	2016	\$269,231(13)	\$4,052,876	\$ 300,000	\$ 21,055	\$4,643,162
John Furey Chief Operating Officer	2016	\$38,077 (14)	\$5,457,325	\$ —	\$ 2,514	\$5,497,916

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 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 note 3(k) and 11 of "Notes to Consolidated Financial Statements" in our Annual Report on Form 10-K filed with the SEC on February 28, 2017 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, 2016.

The amounts reported in the “Non-equity incentive plan compensation” column represent signing bonuses as well as bonuses awarded in July 2014 to Mr. Marrazzo to reflect performance from July 1, 2013 to June 30, 2014, in March 2015 to Messrs. Marrazzo and Webster for performance from July 1 to December 31, 2014, in January 2016 for performance in 2015, and in January 2017 for performance in 2016. Dr. High’s 2014 bonus reflects the terms of our employment agreement with her, her 2015 bonus reflects a bonus award in January 2016 for performance in 2015, and her 2016 bonus reflects a bonus award in January 2017 for performance in 2016. Mr. Faga's payments represent a sign-on bonus paid in May 2016 of \$150,000 and a pro-rated bonus award in January 2017 of \$150,000 for performance in 2016.

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 2014, 2015 and 2016.

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

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

(6)Mr. Marrazzo's annualized base salary increased to \$392,000 from \$300,000 in 2014.

- (7)Dr. High's annualized base salary increased to \$415,000 from \$405,000 in 2016.
- (8)Dr. High's annualized base salary increased to \$405,000 from \$367,171 in 2015.
- (9)Dr. High joined us on September 16, 2014. Dr. High's annualized base salary for 2014 was \$367,171.
- (10)Mr. Webster's annualized base salary increased to \$400,000 from \$350,000 in 2016.
- (11)Mr. Webster's annualized base salary increased to \$350,000 from \$300,000 in 2015.
- (12)Mr. Webster joined us on July 7, 2014. Mr. Webster's annualized base salary for 2014 was \$300,000.
- (13)Mr. Faga joined us on May 2, 2016. Mr. Faga's annualized base salary for 2016 was \$400,000.
- (14)Mr. Furey joined us on December 1, 2016. Mr. Furey's annualized base salary for 2016 was \$450,000.

## Grants of plan-based awards

The following table shows information regarding grants of plan-based awards during the fiscal year end December 31, 2016 to our named executive officers.

Name and principal position	Grant date	Estimated future payouts under non-equity plan awards target (\$)	All other stock awards: Number of shares 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	1/5/2016	—	—	135,000	(3) \$40.44	\$3,575,667
Katherine A. High, M.D. President and Chief Scientific Officer	1/5/2016	—	—	55,000	(3) \$40.44	\$1,456,637
Stephen W. Webster Chief Financial Officer	1/5/2016	—	—	55,000	(3) \$40.44	\$1,456,637
Daniel R. Faga Chief Business Officer	5/2/2016	—	—	160,000	(4) \$37.62	\$4,052,876
John Furey Chief Operating Officer	12/1/2016	—	—	160,000	(4) \$49.74	\$5,457,325

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 note 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 28, 2017 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, 2016.

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

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

(4) New hire stock grant with time-based vesting criteria established by the Compensation Committee and described in CD&A above.



Outstanding equity awards at December 31, 2016

The following table sets forth information concerning outstanding equity awards at December 31, 2016 for each of our named executive officers.

Name	Option awards				Option expiration date	Stock awards	
	Number of securities underlying unexercised options exercisable	Number of securities underlying exercised options exercisable	exercise price (\$/share)			Number of shares or units of stock that have not vested	Market value of shares or units of stock that have not vested (\$)(1)
Jeffery D. Marrazzo	—	135,000	(2)	\$ 40.44	1/4/2026	—	—
	54,688	70,312	(3)	\$ 68.45	3/15/2025	—	—
	178,169	163,902	(4)	\$ 3.45	7/2/2024	—	—
Katherine A. High, M.D.	—	55,000	(5)	\$ 40.44	1/4/2026	25,000	(13)\$1,247,500
	30,625	39,375	(6)	\$ 68.45	3/15/2025	—	—
	98,906	59,343	(7)	\$ 3.45	7/2/2024	—	—
Stephen W. Webster	—	55,000	(8)	\$ 40.44	1/4/2026	—	—
	26,250	33,750	(9)	\$ 68.45	3/15/2025	—	—
	64,633	81,382	(10)	\$ 3.45	7/7/2024	—	—
Daniel R. Faga	—	160,000	(11)	\$ 37.62	5/1/2026	—	—
John Furey	—	160,000	(12)	\$ 49.74	11/30/2026	—	—

(1) The fair market value of the unvested stock awards was calculated using our common stock price of \$49.90 per share, the closing price of our common stock on the Nasdaq Global Select Market on December 31, 2016.

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 1, 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 55,000 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 70,000 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 158,249 shares of common stock granted on July 1, 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.

(8) Represents options to purchase 55,000 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 60,000 shares of common stock granted on March 16, 2015. The shares underlying (9) 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 (10) 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 160,000 shares of common stock granted on May 2, 2016. The shares underlying (11) 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 160,000 shares of common stock granted on December 1, 2016. The shares (12) underlying these options vest as follows: 25% vest on December 1, 2017 and the remainder vests in equal quarterly installments over the following three years.

(13) Restricted stock award vests in equal quarterly installments through March 13, 2017.

## 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, 2016.

Name	Option awards number of shares acquired on exercise	Option awards value realized on exercise	Stock awards number of shares acquired on vesting	Stock awards value realized on vesting
Jeffery D. Marrazzo	95,000	\$4,946,419	—	\$ —
Katherine A. High, M.D.	—	\$—	100,000	\$ —
Stephen W. Webster	20,000	\$938,804	—	\$ —

## Employment, severance and change-in-control arrangements

We have written employment agreements with each of our named executive officers - Mr. Marrazzo, Dr. High, Mr. Faga, Mr. Furey and Mr. Webster. 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 or her 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

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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, such named executive officer's unvested equity awards will vest on a monthly basis for the period from the last vesting date of each equity award through the date of termination of his or her employment.

In addition, if there occurs a change of control, any unvested equity granted prior to the corporate conversion will become vested. Additionally, 50% of the unvested portion of each of our executive officers' unvested equity awards that were outstanding at the time of the change of control will vest immediately, and 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 of control, such executive officer's unvested equity awards that were outstanding at the time of the change of 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, 2016 are set forth in the table below using our common stock price of \$49.90, the closing price of our common stock on the Nasdaq Global Select Market on December 31, 2016. 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	\$—	\$ 787,500	(1) \$ 1,680,000	(2)
	Bonus payment	—	315,000	(3) 315,000	(3)
	Continuation of benefits	—	32,254	(4) 32,254	(4)
	Market value of stock vesting	4,445,174	(5) 742,232	(6) 8,890,348	(7)
	Total	\$4,445,174	\$ 1,876,986	\$ 10,917,602	
Katherine A. High, M.D.	Severance payments	\$—	\$ 415,000	(1 ) \$ 902,625	(2)
	Bonus payment	—	186,750	(3 ) 186,750	(3)
	Continuation of benefits	—	21,502	(4 ) 32,254	(4)
	Market value of stock vesting	2,262,141	(5) 283,214	(6 ) 4,524,282	(7)
	Total	\$2,262,141	\$ 906,466	\$ 5,645,911	
Stephen W. Webster	Severance payments	\$—	\$ 400,000	(1 ) \$ 840,000	(2)
	Bonus payment	—	160,000	(3 ) 160,000	(3)
	Continuation of benefits	—	21,502	(4 ) 32,254	(4)
	Market value of stock vesting	2,150,247	(5) 490,086	(6 ) 4,300,494	(7)
	Total	\$2,150,247	\$ 1,071,588	\$ 5,332,748	
Daniel R. Faga	Severance payments	\$—	\$ 400,000	(1 ) \$ 840,000	(2)
	Bonus payment	—	106,250	(3 ) 160,000	(3)
	Continuation of benefits	—	20,039	(4 ) 30,059	(4)
	Market value of stock vesting	982,400	(5) 327,467	(6 ) 1,964,800	(7)
	Total	\$982,400	\$ 853,756	\$ 2,994,859	
John Furey	Severance payments	\$—	\$ 450,000	(1 ) \$ 945,000	(2)
	Bonus payment	—	—	(3 ) 180,000	(3)

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Continuation of benefits	—	21,502	(4 )	32,254	(4)
Market value of stock vesting	12,800	(5) 533	(6 )	25,600	(7)
Total	\$ 12,800	\$ 472,035		\$ 1,182,854	

(1) Upon involuntary termination or termination for Good Reason (not associated with a change-in-control), the CEO is entitled to 18 months base salary, while other NEOs are eligible for 12 months base salary.

Upon involuntary termination or termination for Good Reason (within 24 months of a change-in-control), the CEO (2) 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.

- (3) 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, NEOs are eligible for the Company to continue to pay the employer-paid portion of medical, dental, and vision benefits. The CEO 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 NEOs 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).
- (5) Upon a change-in-control, vesting for 50% of unvested equity awards will accelerate upon the change-in-control. 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 on a monthly basis (vs. quarterly) for the period from the last vesting date of each equity award through 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 2016.

Neither Mr. Marrazzo nor Dr. High, our directors who also serve as our chief executive officer and our president and chief scientific officer, 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 2016 is presented in “Summary Compensation Table”.

Name (1)	Fees earned or paid in cash	Option awards (2)	Stock awards (3)	Total
Steven M. Altschuler, M.D. (4)	\$63,500	\$219,226	\$741,200	\$1,023,926
A. Lorris Betz, M.D., Ph.D. (5)	\$35,000	\$219,226	—	\$254,226
Lars G. Ekman, M.D., Ph.D.	\$55,000	\$219,226	—	\$274,226
Anand Mehra, M.D.	\$52,500	\$219,226	—	\$271,726
Vincent J. Milano	\$47,534	\$219,226	—	\$266,760
Elliott Sigal, M.D., Ph.D.	\$48,500	\$219,226	—	\$267,726
Lota Zoth, CPA	\$49,313	\$506,574	—	\$555,887

- The aggregate number of stock option awards outstanding as of December 31, 2016 for the non-employee members of the Board of Directors was: Dr. Altschuler: 43,203, Dr. Betz: 33,000, Dr. Ekman: 43,203, Dr. Mehra: 43,203, Mr. Milano: 43,203, Dr. Sigal: 48,989, and Ms. Zoth: 18,000. The aggregate number of stock awards outstanding as of December 31, 2016 for the non-employee members of the Board of Directors was: Dr. Altschuler: 20,000, Dr. Betz: 0, Dr. Ekman: 0, Dr. Mehra: 0, Mr. Milano: 0, Dr. Sigal: 3,276, and Ms. Zoth: 0.
- (2) 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 2016 as computed in accordance with Accounting Standards Codification, or 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 28, 2017 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, 2016. 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.
- (3) 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 2016 as computed in accordance with Accounting Standards Codification, or ASC, Topic 718 Compensation - Stock Compensation, not including any estimates of forfeitures.
- (4)

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. In recognition of Dr. Altschuler's contributions to the Board as its Chairman, our Compensation Committee awarded Dr. Altschuler a one-time restricted stock award of 20,000 shares of common stock. The restricted stock award vested one-third on July 1, 2016 and the remaining two-thirds will vest annually over the next two years.

(5) 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.

#### Director compensation arrangements

For 2016, our non-employee directors are compensated for their services on our Board of Directors as follows:

- upon appointment to the Board, directors receive a one-time annual stock option award of 12,000 options;
- annually, each member of the Board receives 6,000 stock options grant on the date of the annual meeting;
- each non-employee director receives an annual retainer of \$35,000;
- the chairman of the Board receives an additional annual retainer of \$25,000; and
- 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 \$7,500; chair an annual retainer of \$15,000;
  - Compensation Committee - an annual retainer of \$5,000; chair an annual retainer of \$10,000; and

• Nominating and Corporate Governance Committee - an annual retainer of \$3,500; chair an annual retainer of \$7,500; 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:

- for any breach of the director's duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- for voting or assenting to unlawful payments of dividends, stock repurchases or other distributions; or
- for 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, if 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 11, 2017, there were options to purchase 1,375,133 shares of our common stock outstanding under the 2014 plan, at a weighted-average exercise price of \$4.16 per share, and options to purchase 792,064 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 of Directors. As of January 1, 2017, the number of shares authorized for issuance under the 2015 plan automatically increased, pursuant to the terms of the plan, by 1,234,641 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;

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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).

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 11, 2017, there were options to purchase 3,094,216 shares of our common stock outstanding under the 2015 plan, at a weighted-average exercise price of \$51.52 per share, and 103,984 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 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 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 provides 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. As of January 1, 2017, the number of shares authorized for issuance under the 2015 ESPP automatically increased, pursuant to the terms of the plan, by 308,660 shares of common stock. During the year ended December 31, 2016, we issued 8,012 shares of common stock pursuant to the 2015 ESPP. 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.

#### 401(k) retirement plan

We maintain a 401(k) retirement plan that is intended to be a tax-qualified defined contribution plan under Section 401(k) of the Internal Revenue Code. In general, all of our employees are eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan includes a salary deferral arrangement pursuant to which participants may elect to reduce their current compensation by up to the statutorily prescribed limit, equal to \$18,000 in 2017, and have the amount of the reduction contributed to the 401(k) plan. Participants who are at least 50 years old also can make "catch-up" contributions, which in 2017 may be up to an additional \$6,000 above the statutory limit. We also currently make 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 vests in full.

Securities authorized for issuance under equity compensation plans

The following table contains information about our equity compensation plans as of December 31, 2016. As of December 31, 2016, we had three equity compensation plans, our 2015 plan, 2015 ESPP and 2014 plan, 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)
Equity compensation plans approved by security holders	4,201,493	(1)\$33.25	(2)913,358
Equity compensation plans not approved by security holders	—	—	—
Total	4,201,493	\$33.25	913,358

(1) Includes 19,500 shares subject to 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.

(2) The calculation does not take into account the 19,500 shares of common stock subject to outstanding restricted stock units. Such shares will be issued at the time the restricted stock units vests, without any cash consideration payable for those shares.

(3) Consists of shares available for future issuance under the 2015 plan and 2015 ESPP. As of December 31, 2016, 430,542 shares of common stock were available for issuance under the 2015 plan, and 482,816 shares of common stock were available for issuance under the 2015 ESPP.

(4) Our 2015 plan and our 2015 ESPP contains an "evergreen" provision, which allows for an annual increase in the 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 General Counsel.

##### Accounting considerations

We account for equity compensation paid to our employees in accordance with FASB Accounting Standards Codification Topic 718, Compensation-Stock Compensation, or ASC 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 11, 2017, 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 31,092,670 shares of common stock outstanding as of April 11, 2017. 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 11, 2017, 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	
<b>Named Executive Officers and Directors</b>			
Jeffrey D. Marrazzo (1)	567,491	1.8	%
Katherine A. High, M.D. (2)	370,984	1.2	%
Stephen W. Webster (3)	137,573	*	
Daniel R. Faga (4)	40,000	*	
John P. Furey	—	*	
Steven M. Altschuler, M.D. (5)	45,569	*	
A. Lorris Betz, M.D., Ph.D. (6)	26,250	*	
Lars Ekman, M.D., Ph.D. (7)	33,902	*	
Anand Mehra, M.D. (8)	938,888	3.0	%
Vincent J. Milano (9)	33,902	*	
Elliott Sigal, M.D., Ph.D. (10)	82,626	*	
All executive officers and directors as a group (13 persons)	2,342,228	7.3	%
<b>5% Stockholders</b>			
CHOP Foundation (11)	5,822,859	18.7	%
FMR LLC (12)	4,575,757	14.7	%
T. Rowe Price Associates, Inc. (13)	3,210,596	10.3	%
The Vanguard Group (14)	1,736,974	5.6	%
BlackRock, Inc. (15)	1,552,652	5.0	%

\* Less than 1%

Consists of (a) 230,000 shares of common stock and (b) 337,491 shares of shares of common stock underlying (1) options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date owned by Mr. Marrazzo.

Consists of (a) 210,000 shares of common stock and (b) 160,984 shares of shares of common stock underlying (2) options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date owned by Dr. High.

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- Consists of (a) 2,500 shares of common stock and (b) 135,073 shares of shares of common stock underlying
- (3) options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date owned by Mr. Webster.
- (4) Consists of shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date owned by Mr. Faga.
- Consists of (a) 11,667 shares of common stock owned by Dr. Altschuler, (b) 6,000 shares of shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date owned by Dr. Altschuler, and (b) 27,902 shares of common stock underlying options that are exercisable
- (5) as of April 11, 2017 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.
- Consists of 26,250 shares of shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date. Dr. Betz holds such options as a nominee of the CHOP
- (6) Foundation, which shall receive any economic benefit associated with such options. Dr. Betz disclaims beneficial ownership of such options.
- (7) Consists of 33,902 shares of shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date.
- Consists of 904,986 shares of common stock owned by Sofinnova Venture Partners VIII, L.P. ("SVP VIII") and (b) 33,902 shares of common stock under options that are exercisable as of April 11, 2017 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 persons and entities disclaim
- (8) 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 13D/A that was filed with the SEC on December 16, 2016. 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 33,902 shares of shares of common stock underlying options that are exercisable as of April 11, 2017 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) 39,853 shares of common stock underlying options that are exercisable as
- (10) of April 11, 2017 or will become exercisable within 60 days after such date. Dr. Sigal 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.
- Consists of (a) 5,768,707 shares of common stock owned by the CHOP Foundation, (b) 27,902 shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60 days after such date issued to Dr. Altschuler as a nominee of the CHOP Foundation and (c) 26,250 shares of shares of common stock underlying options that are exercisable as of April 11, 2017 or will become exercisable within 60
- (11) days after such date issued to Dr. Betz 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 February 14, 2017.
- (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 14, 2017.

(13) Based on information provided in a Schedule 13G/A filed on February 10, 2017. 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) 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 37,863 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 2,432 shares of the common stock of the Company. Based on information provided in a Schedule 13G filed on February 13, 2017.

(15) The address for BlackRock, Inc. is 55 E 52<sup>nd</sup> 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 more than five percent of the total outstanding common shares. Based on information provided in a Schedule 13G filed on January 30, 2017.

#### CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

During 2016, 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 \$7.4 million during the year ended December 31, 2016. 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 June 2016, we offered 3,025,000 shares of common stock and CHOP offered 1,000,000 shares of our common stock. Affiliates of FMR LLC and The Vanguard Group, holders of more than 5% of our voting securities, purchased 378,500 and 135,000 shares, respectively, of our common stock in this offering through the underwriters at the offering price of \$45.00 per share. No other directors, executive officers or 5% stockholders or their affiliates purchased stock in this follow-on offering.

#### Investors' rights agreement

We are a party to an investors' rights agreement, dated May 23, 2014, which we refer to as the Investors' Rights Agreement, with certain of our stockholders who purchased shares of our Series A Preferred Stock and Series B Preferred Stock, which includes certain of our stockholders and entities affiliated with two of our directors. The Investors' Rights Agreement provides these holders the right to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing.

#### 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, Spark believes that all Section 16(a) filing requirements were complied with during the fiscal year ended December 31, 2016, except that a Form 4 for Katherine High for transactions on May 24, 2016, was filed before the market opened on May 27, 2016.

#### AUDIT COMMITTEE REPORT (1)

The Audit Committee has reviewed the Company's audited financial statements for the fiscal year ended December 31, 2016, 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 Auditing Standard 1301 (AS 1301)  
(Communication with Audit

Committees), as adopted by the Public Company Accounting Oversight Board, or PCAOB. 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, 2016, for filing with the SEC.

Respectfully submitted by the  
Audit Committee of the Board of Directors

Lota Zoth, CPA, Chair  
Lars Ekman, M.D., Ph.D.  
Anand Mehra, M.D.

This section is not "soliciting material," is not deemed filed with the SEC and is not to be incorporated by reference (1) in any filing of the Company under the Securities Act of 1933 or the Securities Exchange Act of 1934, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

**PROPOSAL 4: 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 Spark for the fiscal year ending December 31, 2017. KPMG LLP acted as the independent registered public accounting firm for the Company for the years ended December 31, 2014, December 31, 2015, and December 31, 2016. 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. Spark 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 Spark.

**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	2015	2016
Audit fees (1)	\$410,000	\$745,000
Audit-related fees	—	—
Tax fees (2)	56,370	129,756
All other fees	—	—

Total fees \$466,370 \$874,756

(1) Audit fees consist of fees for the audit of our financial statements, the review of our interim financial statements and services associated with our registration statements on Form S-3 and consent on Form S-8.

(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, 2017 (PROPOSAL 4 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 Spark, 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 General Counsel, 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 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](http://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](http://www.sec.gov). You may also read and copy any document the Company files with the SEC on our website at [www.sparktx.com](http://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. Spark has not authorized anyone to provide you with information that is different from what is contained in this document. This document is dated April 21, 2017. 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](http://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, 2016 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

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#### HOUSEHOLDING OF ANNUAL MEETING MATERIALS

Stockholders of Spark 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, 2016, unless Spark 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, 2016, 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 Spark 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.



