

bluebird bio, Inc.
Form DEF 14A
April 24, 2015

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

SCHEDULE 14A

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

(Amendment No.)

Filed by the Registrant

Filed by a party other than the Registrant

Check the appropriate box:

Preliminary Proxy Statement

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

Definitive Proxy Statement

Definitive Additional Materials

Soliciting Material Pursuant to §240.14a-12

bluebird bio, Inc.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement, if Other Than The Registrant)

Payment of Filing Fee (Check the appropriate box):

No fee required.

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

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

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

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

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Fee paid previously with preliminary materials.

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

(1) Amount Previously Paid:

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

(3) Filing Party:

(4) Date Filed:

April 24, 2015

Dear Stockholder:

You are cordially invited to attend the 2015 Annual Meeting of Stockholders of bluebird bio, Inc. The meeting will be held on June 4, 2015 at 8:30 a.m. EDT at the offices of the Company, located at 150 Second Street, Third Floor, Cambridge, Massachusetts.

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

At this Annual Meeting, the agenda includes the election of two (2) Class II directors for three-year terms, the ratification of the appointment of Ernst & Young LLP as bluebird's independent registered public accounting firm for the fiscal year ending December 31, 2015, 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.

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

We hope that you will join us on June 4, 2015. Your continuing interest in bluebird is very much appreciated.

Sincerely,

Nick Leschly

President & Chief Executive Officer

NOTICE OF 2015 ANNUAL MEETING OF STOCKHOLDERS

Time 8:30 a.m., Eastern Time

Date Thursday, June 4, 2015

Place The Company's offices at 150 Second Street, Third Floor, Cambridge, Massachusetts

Purpose To elect Daniel S. Lynch and John M. Maraganore as Class II members of the Board of Directors, to serve until the Company's 2018 Annual Meeting of Stockholders and until their successors are duly elected and qualified;

To hold an advisory vote on the compensation paid to the Company's named executive officers;

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;

To ratify the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2015; and

To transact any other business that may properly come before the meeting or any adjournment thereof.

Record Date The Board of Directors has fixed the close of business on April 10, 2015 as the record date for determining stockholders entitled to notice of and to vote at the meeting.

Meeting Admission All stockholders as of the record date, or their duly appointed proxies, may attend the meeting. If you attend, you will be asked to present valid picture identification such as a driver's license or passport. If your bluebird stock is held in a brokerage account or by a bank or other nominee, you are considered the beneficial owner of shares held in street name, and this proxy statement is being forwarded to you by your broker or nominee. As a result, your name does not appear on our list of stockholders. If your stock is held in street name, in addition to picture identification, you should bring with you a letter or account statement showing that you were the beneficial owner of the stock on the record date, in order to be admitted to the meeting.

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 may also 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 may also 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,

Jason F. Cole, Secretary

Cambridge, Massachusetts

April 24, 2015

Important Notice Regarding the Availability of Proxy Materials for the bluebird 2015 Annual Meeting of Stockholders to Be Held on June 4, 2015: The Notice of 2015 Annual Meeting of Stockholders, proxy statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2014, as amended, are available at www.bluebirdbio.com by following the link for “Investors & Media.” To obtain directions to our offices in order to attend the annual meeting in person, please visit the “Investors & Media – Calendar of Events” section of our website at www.bluebirdbio.com or contact Investor Relations at (339) 499-9300.

BLUEBIRD BIO, INC.

150 SECOND STREET

THIRD FLOOR

CAMBRIDGE, MASSACHUSETTS 02141

PROXY STATEMENT

FOR THE 2015 ANNUAL MEETING OF STOCKHOLDERS

TO BE HELD ON JUNE 4, 2015

AT 8:30 AM EDT

GENERAL INFORMATION

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

We have elected to provide access to our proxy materials to our stockholders via the Internet. Accordingly, on or about April 24, 2015, we will begin mailing a Notice of Internet Availability of Proxy Materials, or Notice of Internet Availability, and the proxy materials, including the Notice of 2015 Annual Meeting of Stockholders, this proxy statement and accompanying proxy card or, for shares held in street name (held for your account by a broker or other nominee), voting instruction form, and the Annual Report on Form 10-K for the year ending December 31, 2014 will be made available to stockholders on the Internet on the same date.

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

Pursuant to rules adopted by the 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 28, 2015. 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 will also 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 bluebird bio, Inc. (the “Company” or “bluebird”) is soliciting your vote for the 2015 Annual Meeting of Stockholders.

When is the record date for the Annual Meeting?

The Company's Board of Directors has fixed the record date for the Annual Meeting as of the close of business on April 10, 2015.

How many votes can be cast by all stockholders?

A total of 32,776,482 shares of common stock of the Company were outstanding on April 10, 2015 and entitled to be voted at the meeting. Each share of common stock is entitled to one vote on each matter.

1

How do I vote?

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

- By Internet. Access the website of the Company's tabulator, Broadridge, at: www.proxyvote.com, using the voter control number printed on the furnished proxy card. Your shares will be voted in accordance with your instructions. You must specify how you want your shares voted or your Internet vote cannot be completed and you will receive an error message. If you vote on the Internet, you may also 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. Complete and mail a proxy card in the enclosed postage prepaid envelope 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 nominees named herein to the Company's Board of Directors, FOR the approval of compensation of the named executive officers and for holding an advisory vote on the compensation of the Company's named executive officers every THREE years, and FOR the ratification of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2015 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 or voting instruction form, and you choose to vote by telephone or by Internet, you do not have to return your proxy card or voting instruction form.
- 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.

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

- By Internet or By Telephone. You will receive instructions 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 both bring 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 two 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 THREE years (page 16)

Proposal 4: FOR ratification of the selection of Ernst & Young LLP as the Company's independent registered public accounting firm (page 43)

Who pays the cost for soliciting proxies?

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

2

Can I change my vote?

You may revoke your proxy at any time before it is voted by notifying the Secretary in writing, by returning a signed proxy with a later date, by transmitting a subsequent vote over the Internet or by telephone prior to the close of the Internet voting facility or the telephone voting facility, or by attending the meeting and voting in person. If your stock is held in street name, you must contact your broker or nominee for instructions as to how to change your vote.

What vote is required to approve each item?

The two nominees for election as Class II directors who receive a plurality of the votes cast for election of directors shall be elected directors (Proposal 1). A majority of votes cast is necessary for the approval of the advisory resolution on the compensation of the Company's named executive officers (Proposal 2). 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 (Proposal 3). This means that the option that receives the most votes will be recommended by the stockholders to the Board of Directors. Abstentions and broker non-votes are not counted for the advisory vote on frequency of advisory votes on the Company's executive compensation and, therefore, will have no effect on the outcome of the proposal. A majority of votes cast is necessary for ratification of the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2015 (Proposal 4).

If there are insufficient votes to approve Proposal(s) 1, 2, 3, or 4, your proxy may be voted by the persons named in the proxy to adjourn the Annual Meeting in order to solicit additional proxies in favor of the approval of such proposal. If the Annual Meeting is adjourned or postponed for any purpose, at any subsequent reconvening of the meeting, your proxy will be voted in the same manner as it would have been voted at the original convening of the Annual Meeting unless you withdraw or revoke your proxy. Your proxy may be voted in this manner even though it may have been voted on the same or any other matter at a previous session of the Annual Meeting.

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" (i.e., shares represented at the meeting held by brokers, bankers or other nominees as to which instructions have not been received from the beneficial owners or persons entitled to vote such shares and, with respect to one or more (but not all) issues), if any, will be counted for purposes of determining whether a quorum is present for the transaction of business at the meeting.

How is the vote counted?

Votes cast by proxy or in person at the Annual Meeting will be counted by the persons appointed by bluebird to act as tabulators for the meeting. The tabulators will count all votes "for," "against," to "withhold," frequency and abstentions and broker non-votes (i.e., where a broker has not received voting instructions from the beneficial owner and for which the broker does not have discretionary power to vote on a particular matter), 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 Proposals 1 and 3, but will be the same as a vote "against" Proposals 2 and 4.

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 Ernst & Young 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 Proposals 1, 2 and 3 unless you affirmatively provide the broker instructions on how to vote on these non-routine matters.

3

Could other matters be decided at the Annual Meeting?

bluebird 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 until it is voted.

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 expect to file with the SEC within four business days after the annual meeting. If final voting results are not available to us in time to file a Form 8-K within four business days after the annual meeting, we intend to file a Form 8-K to publish preliminary results and, within four business days after the final results are known to us, file an additional Form 8-K to publish the final results.

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 Jason F. Cole, Secretary of the Company, at (339) 499-9300. If your shares are held in street name, please contact the telephone number provided on your voting instruction form or contact your broker or nominee holder directly.

PROPOSAL 1: ELECTION OF DIRECTORS

In accordance with Delaware law and the Company's certificate of incorporation and By-laws, the Board of Directors is divided into three classes of approximately equal size. The members of each class are elected to serve a three-year term with the term of office of each class ending in successive years. Daniel S. Lynch and John M. Maraganore are the directors whose terms expire at this Annual Meeting and each of Mr. Lynch and Dr. Maraganore has been nominated for and has agreed to stand for re-election to the Board of Directors to serve as a Class II director of the Company until the 2018 Annual Meeting and until his successor is duly elected. Pursuant to the By-laws, the Board of Directors has fixed the number of directors at eight (8) as of the date of this year's Annual Meeting of Stockholders.

It is intended that, unless you give contrary instructions, shares represented by proxies solicited by the Board of Directors will be voted for the election of the two 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. bluebird 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 of Directors, or the Board of Directors 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 bluebird, principal occupation and other biographical material is shown below.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE

FOR

EACH OF THESE NOMINEES FOR CLASS II DIRECTOR

(PROPOSAL 1 ON YOUR PROXY CARD)

5

DIRECTOR BIOGRAPHIES

The following table sets forth information concerning our directors as of April 24, 2015. 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.

CLASS II DIRECTOR NOMINEES

| | AGE | DIRECTOR SINCE |
|--|-----|----------------|
| <p>Daniel S. Lynch – Mr. Lynch is a Class II director who has served as chairman of our board of directors since May 2011. Since October 2007, Mr. Lynch has advised and served as executive chair or member of the board of directors for a number of private biopharmaceutical companies, which include Stromedix, Inc. (until its acquisition by Biogen Idec in February 2012), Avila Therapeutics, Inc. (until its acquisition by Celgene Corporation in February 2012), Nimbus Discovery, LLC, Edimer Pharmaceuticals and Ember Therapeutics, Inc. He serves on the board of directors of BIND Biosciences, Inc., Eleven Biotherapeutics, Inc., RaNA Therapeutics, Inc., and Blueprint Medicines, Inc. Mr. Lynch joined Third Rock Ventures, L.P., or Third Rock, as an entrepreneur-in-residence in May 2011, and became a Venture Partner in May 2013. Previously, Mr. Lynch served as chief executive and chief financial officer of ImClone Systems Corporation, or ImClone. As ImClone’s chief executive officer, he led ImClone through a significant turnaround, helping to restore the company’s reputation and to secure FDA approval of ERBITUX (Cetuximab), a novel cancer treatment. As its chief financial officer, Mr. Lynch led negotiations to form the major partnership between ImClone and Bristol-Myers Squibb. Earlier in his career, he served in various financial positions at Bristol-Myers Squibb over a 15-year tenure. He served on the board of directors and the audit committee of U.S. Oncology, Inc. for five years until December 2010, when it was acquired by McKesson. Mr. Lynch received his B.A. in mathematics from Wesleyan University and his M.B.A. from the Darden Graduate School of Business Administration at the University of Virginia. We believe that Mr. Lynch’s experience as chief executive officer and chief financial officer of a public pharmaceutical company and as executive chairman and director for many other life science companies, qualify him to serve as a member of our board of directors.</p> | 57 | May 2011 |
| <p>John M. Maraganore, Ph.D. – Dr. Maraganore is a Class II director who has served as a member of our board of directors since January 2012. Since December 2002, Dr. Maraganore has served as the chief executive officer and as a director of Alnylam Pharmaceuticals, Inc. From December 2002 to December 2007, Dr. Maraganore served as president of Alnylam. From April 2000 to December 2002, Dr. Maraganore served as senior vice president, strategic product development with Millennium Pharmaceuticals, Inc. (now a subsidiary of Takeda) where he was responsible for the company’s product franchises in Oncology and Cardiovascular, Inflammatory and Metabolic Diseases. He was previously Vice President, Strategic Planning and M&A and prior to that he was general manager of Millennium Bio Therapeutics, Inc. a former subsidiary of Millennium. Before Millennium, he served as director of molecular biology and director of market and business development at Biogen, Inc. (now Biogen Idec, Inc.). Prior to Biogen, Dr. Maraganore was a scientist at ZymoGenetics, Inc., and The Upjohn Company. Dr. Maraganore is also a director for Agios Pharmaceuticals and was previously a director of Regulus Therapeutics, Inc. (through May 2014). In addition, he</p> | 52 | January 2012 |

serves as a Venture Partner at Third Rock Ventures, LLC. Dr. Maraganore is a member of the Biotechnology Industry Organization (BIO) Board and the BIO Executive Committee. Dr. Maraganore holds a B.A. in biological sciences from the University of Chicago and an M.S. and a Ph.D. in biochemistry and molecular biology from the University of Chicago. We believe that Dr. Maraganore's experience as chief executive officer and president of a public pharmaceutical company and as a board member of other public pharmaceutical companies qualify him to serve as a member of our board of directors.

CURRENT DIRECTORS NOT STANDING FOR

ELECTION AT THE ANNUAL MEETING

| | AGE | DIRECTOR SINCE |
|--|-----|----------------|
| <p>Wendy L. Dixon, Ph.D. – Dr. Dixon is a Class III director who has served as a member of our board of directors since April 2013. In 2012, Dr. Dixon was a principal at Great Meadow Consulting LLC and in 2010, she served as senior advisor at The Monitor Group. Since 2005, Dr. Dixon has advised and consulted and in some instances served as a member of the board of director for a number of biopharmaceutical companies, including Alkermes PLC, Eleven Biotherapeutics, Incyte Corporation, Orexigen Therapeutics Inc. and Edimer Pharmaceuticals Inc. Dr. Dixon was formerly on the board of Ardea Biosciences, Inc. (sold to AstraZeneca PLC in 2012), Dentsply International, and Furiex Pharmaceuticals Inc. (sold to Actavis in 2014). Dr. Dixon also served as Chief Marketing Officer and President of Global Marketing for Bristol-Myers Squibb and as a member of the CEO’s Executive Committee from 2001 to 2009. She has had an over 30-year career in the pharmaceutical and biotechnology business, combining a technical background and experience in drug development and regulatory affairs with commercial responsibilities in building and leading organizations and launching and growing more than 20 pharmaceutical products including Tagamet, Fosamax, Singulair, Plavix, Abilify, Reyataz and Baraclude. From 1996 to 2001, she was Senior Vice President Marketing at Merck and prior to that she held executive management positions at West Pharmaceuticals, Osteotech and Centocor, and various positions at SmithKline and French (now GlaxoSmithKline) in marketing, regulatory affairs, project management and as a biochemist. Dr. Dixon received her B.Sc., M.Sc. and Ph.D. from the University of Cambridge (UK). We believe that, among other experience, qualifications, attributes and skills, Dr. Dixon’s technical background in drug development, commercialization, marketing and regulatory affairs qualify her to serve as a member of our board of directors.</p> | 59 | April 2013 |
| <p>Steven Gillis, Ph.D. – Dr. Gillis is a Class I director who has served as a member of our board of directors since April 2011. Since 2005, Dr. Gillis has been a managing director at ARCH Venture Partners, a venture capital firm. From 1994 to 2005, Dr. Gillis served as chief executive officer and chairman of the board of directors of Corixa Corporation, which he co-founded in October 1994. Previously, Dr. Gillis served as a director, head of research and development, chief scientific officer and acting chief executive officer of Immunex Corporation, which he co-founded. As a former director and chairman of Trubion Pharmaceuticals, Inc., Dr. Gillis led its acquisition by Emergent BioSolutions in the fall of 2010. Dr. Gillis currently serves as a director of Shire plc, Accelerator Corporation, Oncofactor Corp., Pulmatrix, Inc., and serves as director and chairman of Faraday Pharmaceuticals, Inc., VentiRX Pharmaceuticals, Inc., Theraclone Sciences, Inc., Lycera Corp., PhaseRx, Inc., and VBI Vaccines, Inc. Dr. Gillis received his B.A. in biology and English from Williams College and his Ph.D. in biological science from Dartmouth College. We believe that Dr. Gillis’s experience in the venture capital industry, particularly with biotech and pharmaceutical companies, combined with his experience in molecular and tumor immunology, qualify him to serve as a member of our board of directors.</p> | 63 | April 2011 |
| <p>Nick Leschly – Mr. Leschly is a Class I director who has served as our president and chief executive officer since September 2010. Previously, he served as our interim chief executive officer from March 2010 to September 2010. Formerly a partner of Third Rock Ventures,</p> | 42 | March 2010 |

L.P. since its founding in 2007, Mr. Leschly played an integral role in the overall formation, development and business strategy of several of Third Rock's portfolio companies, including Agios Pharmaceuticals, Inc. and Edimer Pharmaceuticals, Inc. Prior to joining Third Rock, he worked at Millennium Pharmaceuticals, Inc., leading several early-stage drug development programs and served as the product and alliance leader for VELCADE. Mr. Leschly also founded and served as chief executive officer of MedXtend Corporation. He received his B.S. in molecular biology from Princeton University and his M.B.A. from Wharton Business School. We believe that Mr. Leschly's operation and historical experience with our Company gained from serving as our president, chief executive officer and member of the board of directors, combined with his experience in the venture capital industry and drug research and development qualify him to serve as a member of our board of directors.

CURRENT DIRECTORS NOT STANDING FOR

ELECTION AT THE ANNUAL MEETING

| | AGE | DIRECTOR SINCE |
|--|-----|----------------|
| <p>James Mandell, M.D. – Dr. Mandell is a Class III director who has served as a member of our board of directors since January 2014. Dr. Mandell became Chief Executive Officer of Boston Children’s Hospital and Children’s Medical Center on October 1, 2000, retiring from the position in October 2013. During his tenure, Dr. Mandell was a member of the Board of Trustees and Professor of Surgery at Harvard Medical School. Prior to joining Children’s, he served as Dean of Albany Medical College and Professor of Surgery and Pediatrics. Dr. Mandell was promoted from Chief of Urology to Dean of Albany Medical College in 1996. He also served as Executive Vice President for Health Affairs at Albany Medical Center and Executive Medical Director of Albany Medical Center Hospital. Prior to his tenure at Albany Medical College, he was a member of the medical staff at Children’s Hospital for nine years, advancing to an associate in surgery with an associate professor appointment at Harvard Medical School. Dr. Mandell serves on the Board of the Franciscan’s Hospital for Children, the Board of Beth Israel Deaconess Medical Center, and as Chair of the Board of the Harvard Risk Management Company. Dr. Mandell continues to practice Pediatric Urology at Children’s and is the Robert and Dana Smith Distinguished Professor at Harvard Medical School. In addition to a medical degree from the University of Florida College of Medicine, Dr. Mandell holds a Master’s in Health Systems Management from Union College, New York. We believe that, among other experience, qualifications, attributes and skills, Dr. Mandell’s background as a physician focused on pediatric diseases, and experience as the chief executive officer of a major hospital and medical center, including interactions with payers, qualifies him to serve as a member of our board of directors.</p> | 70 | January 2014 |
| <p>David P. Schenkein, M.D. – Dr. Schenkein is a Class III director who has served as a member of our board of directors since April 2013. Since August 2009, Dr. Schenkein has served as the chief executive officer of Agios Pharmaceuticals. From April 2006 to July 2009, Dr. Schenkein served as senior vice president of oncology development of Genentech. Dr. Schenkein is also a director at Agios Pharmaceuticals, Inc. and Foundation Medicine, Inc. Dr. Schenkein received his B.A. in chemistry from Wesleyan University and his M.D. from Upstate Medical School. We believe that Dr. Schenkein’s experience as chief executive officer of Agios Pharmaceuticals and his membership on the board of directors of a number of biopharmaceutical companies qualify him to serve as a member of our board of directors.</p> | 57 | April 2013 |
| <p>Mark Vachon. – Mr. Vachon is a Class I director who has served as a member of our board of directors since July 2014. Mr. Vachon assumed a variety of leadership positions across the General Electric organization over 30 years and was a company officer beginning in 1999 and a member of GE’s Corporate Executive Council. Mr. Vachon was President and CEO of GE Healthcare Americas from 2009 and 2010, and prior to that he was President and CEO of Global Diagnostics Imaging, GE Healthcare, between 2006 and 2009. Between 2003 and 2006, Mr. Vachon was Executive Vice President and CFO of GE Healthcare. Mr. Vachon serves on the board of trustees of Northeastern University and the board of directors of Numotion. Mr. Vachon holds a B.S. in Finance from Northeastern University and plans to graduate with an M.A. from Boston College in May 2015. We believe that Mr. Vachon’s experience in financial and executive operating roles and in the healthcare field on a global</p> | 56 | July 2014 |

basis qualify him to serve as a member of our board of directors.

8

EXECUTIVE OFFICERS

The following table sets forth information regarding our executive officers, as of April 24, 2015:

| Name | Age | Position(s) |
|--------------------------|-----|---|
| Executive Officers: | | |
| Nick Leschly(1) | 42 | President, Chief Executive Officer and Director |
| Jeffrey T. Walsh | 49 | Chief Operating Officer |
| Mitchell H. Finer, Ph.D. | 56 | Chief Scientific Officer |
| David Davidson, M.D. | 51 | Chief Medical Officer |
| James M. DeTore | 50 | Chief Financial Officer and Treasurer (Principal Financial Officer) |
| Jason F. Cole, Esq. | 42 | Senior Vice President, General Counsel and Secretary |
| Eric Sullivan | 35 | Senior Director, Finance (Principal Accounting Officer) |

(1) Nick Leschly is also a director of the Company and his biographical information appears on page 8.

Jeffrey T. Walsh – Mr. Walsh has served as our Chief Operating Officer since May 2011. Mr. Walsh has over 25 years of experience in executive leadership positions with responsibility for finance, business development, commercial and business operations, strategic planning and legal functions with established and emerging public and private life sciences companies. From November 2008 to February 2011, Mr. Walsh served as chief business officer of Taligen Therapeutics, Inc. where he played a key role in the growth of the company and the ultimate sale of Taligen Therapeutics, Inc. to Alexion Pharmaceuticals, Inc. in January 2011. Mr. Walsh started his career at SmithKline Beecham Corporation in finance and worldwide business development roles. He subsequently held senior business development, finance and operations roles at PathoGenesis Corp. (acquired by Chiron Corporation), Allscripts Healthcare Solutions Inc., EXACT Sciences Corporation and Inotek Pharmaceuticals Corp. Mr. Walsh received his B.A. in sociology and economics from Yale University and his M.B.A. from the Kellogg Graduate School of Management at Northwestern University.

Mitchell H. Finer, Ph.D. – Dr. Finer has served as our Chief Scientific Officer since March 2010. Prior to joining us, Dr. Finer served as senior vice president of development and operations for Novocell, Inc. (now ViaCyte, Inc.), a stem cell engineering company researching treatments for diabetes and other chronic diseases from November 2008 through March 2010. From July 2005 through November 2008, Dr. Finer served as chief executive officer of Intracel Holdings LLC. From June 2003 to June 2005, he held the position of president and chief executive officer of Genteric Inc., or Genteric, which filed a voluntary petition for reorganization under Chapter 11 of the U.S. bankruptcy code in August 2004. Previously, he had served as Genteric's chief scientific officer from November 2002 to June 2003 and as vice president of research and development for the Gencell division of Aventis Pharma (now Sanofi) from April 2002 to November 2002. He was also a founder and vice president of research for Cell Genesys Inc., and a founder of Abgenix, Inc. and Avalanche Biotechnologies, Inc. Dr. Finer received his B.A. in biochemistry and bacteriology from the University of California at Berkeley and his Ph.D. in biochemistry and molecular biology from Harvard University. He completed a postdoctoral fellowship at the Whitehead Institute for Biomedical Research.

David Davidson, M.D. – Dr. Davidson has served as our Chief Medical Officer since February 2012. Prior to joining us, Dr. Davidson served as a senior medical director at Genzyme Corporation, or Genzyme, where he led clinical research for programs in Phases I through IV across a wide range of therapeutic areas for more than a decade. Most recently, Dr. Davidson was the medical leader for Genzyme's gene therapy and Pompe disease enzyme replacement therapy programs. In addition to Dr. Davidson's translational medicine experience, he has also worked on a number of commercial products, including Fabrazyme and Myozyme/Lumizyme, and was integral in crafting the new drug application that resulted in the approval of Welchol. Prior to Genzyme, Dr. Davidson was a medical director at GelTex Pharmaceuticals Inc. Previously, he completed clinical and research fellowships in infectious diseases at the

Harvard Longwood Combined Infectious Diseases Program. Dr. Davidson received his B.A. from Columbia University and his M.D. from New York University School of Medicine. In addition, he completed an internal medicine internship, residency training and an endocrinology research fellowship at the University of Chicago Hospitals.

James M. DeTore – Mr. DeTore has served as our Chief Financial Officer and treasurer since November 2014. Prior to joining us, Mr. DeTore served as Vice President, Corporate Finance of Ironwood Pharmaceuticals, Inc. from February 2010 to November 2014, as Vice President, Finance from June 2006 to January 2010 and as Corporate Controller of Microbia, Inc. (Ironwood's predecessor company) from October 2003 to May 2006. From May 1995 through September 2003, Mr. DeTore held financial positions of increasing responsibility at Genzyme Corporation. Mr. DeTore received both his B.S. in finance and MBA from Northeastern University.

Jason F. Cole, Esq. – Mr. Cole has served as our Senior Vice President, General Counsel and Secretary since March 2014. Prior to joining us, Mr. Cole served as Executive Vice President, Corporate Development and General Counsel at Zalicus Inc. from September 2011 through March 2014, and as Senior Vice President, General Counsel of Zalicus and its predecessor company CombinatoRx, Incorporated from January 2006 to September 2011. From 1999 to 2006, Mr. Cole was a corporate and securities attorney at Ropes & Gray LLP. Mr. Cole received an A.B. in government from Dartmouth College and a J.D. from Columbia University School of Law.

Eric Sullivan – Mr. Sullivan has served as our Senior Director of Finance since November 2013. Previously, Mr. Sullivan served as Corporate Controller of Merrimack Pharmaceuticals from January 2011 to November 2013 and as Assistant Controller of Merrimack Pharmaceuticals from September 2008 to December 2010. Prior to Merrimack Pharmaceuticals, Mr. Sullivan held positions at NSTAR and PricewaterhouseCoopers LLP. Mr. Sullivan received his B.S. in accountancy from Bentley University (formerly known as Bentley College) and is a Certified Public Accountant in Massachusetts.

THE BOARD OF DIRECTORS AND ITS COMMITTEES

Board Composition

We currently have eight directors and the terms of office of the directors are divided into three classes:

- Class I, whose term will expire at the annual meeting of stockholders to be held in 2017;
- Class II, whose term will expire at the annual meeting of stockholders to be held in 2015; and
- Class III, whose term will expire at the annual meeting of stockholders to be held in 2016.

Class I consists of Dr. Gillis, Mr. Leschly and Mr. Vachon, Class II consists of Mr. Lynch and Dr. Maraganore and Class III consists of Dr. Dixon, Dr. Mandell and Dr. Schenkein. At each annual meeting of stockholders, the successors to directors whose terms will then expire shall serve from the time of election and qualification until the third annual meeting following election and until their successors are duly elected and qualified. A resolution of the board of directors may change the authorized number of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. This classification of the board of directors may have the effect of delaying or preventing changes in control or management of our company.

Board Independence

Our board of directors has determined, upon the recommendation of our nominating and corporate governance committee, that each of our directors, except for Nick Leschly, who serves as our President and Chief Executive Officer, has no relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and is independent within the meaning of the director independence standards of the Nasdaq Stock Market, or Nasdaq, rules and the SEC. At least annually, our board of directors will evaluate all relationships between us and each director in light of relevant facts and circumstances for the purposes of determining whether a material relationship exists that might signal a potential conflict of interest or otherwise interfere with such director's ability to satisfy his or her responsibilities as an independent director. Based on this evaluation, our board of directors will make an annual determination of whether each director is independent within the meaning of Nasdaq, and the SEC independence standards.

Board Meetings and Attendance

Our board of directors held six meetings during the fiscal year ended December 31, 2014. Each of the directors attended at least 75% of the meetings of the board of directors and the committees of the board of directors on which

he or she served during the fiscal year ended December 31, 2014 (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). bluebird encourages its directors to attend the Annual Meeting of Stockholders.

Board Committees

Our board of directors has established three standing committees: the audit committee, the compensation committee and the nominating and corporate governance committee, each of which is comprised solely of independent directors, and is described more fully below. Each of the audit, compensation and nominating and corporate governance committee operates pursuant to a written charter and each committee reviews and assesses the adequacy of its charter and submits its charter to the Board for approval. The charters for the audit, compensation and nominating and corporate governance committees are all available on our website (www.bluebirdbio.com) under “Investors & Media” at “Corporate Governance.”

Audit Committee

Our audit committee is currently composed of Dr. Dixon, Mr. Lynch, and Mr. Vachon, with Mr. Vachon serving as chairman of the committee. Dr. Gillis served on the audit committee until November 2014. Our board of directors has determined that each member of the audit committee meets the independence requirements of Rule 10A-3 under the Exchange Act and the applicable listing standards of Nasdaq. Our board of directors has determined that Mr. Lynch and Mr. Vachon are “audit committee financial experts” within the meaning of the SEC regulations and applicable listing standards of Nasdaq. During the fiscal year ended December 31, 2014, the Audit Committee met four times. The report of the Audit Committee is included in this Proxy Statement under “Report of the Audit Committee.” The audit committee’s responsibilities include:

- appointing, approving the compensation of, and assessing the independence of our independent registered public accounting firm;
- approving audit and permissible non-audit services, and the terms of such services, to be provided by our independent registered public accounting firm;
- reviewing the audit plan with the independent registered public accounting firm and members of management responsible for preparing our financial statements;
- reviewing and discussing with management and the independent registered public accounting firm our annual and quarterly financial statements and related disclosures as well as critical accounting policies and practices used by us;
- reviewing the adequacy of our internal control over financial reporting;
- establishing policies and procedures for the receipt and retention of accounting-related complaints and concerns;
- recommending, based upon the audit committee’s review and discussions with management and the independent registered public accounting firm, whether our audited financial statements shall be included in our Annual Report on Form 10-K;
- monitoring the integrity of our financial statements and our compliance with legal and regulatory requirements as they relate to our financial statements and accounting matters;
- preparing the audit committee report required by the rules of the Securities and Exchange Commission, or SEC, to be included in our annual proxy statement;
- reviewing all related party transactions for potential conflict of interest situations and approving all such transactions; and
- reviewing quarterly earnings releases and scripts.

Compensation Committee

Our compensation committee is currently composed of Dr. Dixon, Dr. Maraganore and Mr. Lynch, with Mr. Lynch serving as chairman of the committee. Dr. Bob Tepper served on the compensation committee until July 2014. Our board of directors has determined each member of the compensation committee is “independent” as defined under the applicable listing standards of Nasdaq. In addition, each member qualifies as an “outside director” within the meaning of Section 162(m) of the Internal Revenue Code of 1986, as amended. During the fiscal year ended December 31, 2014, the compensation committee met eight times. The compensation committee’s responsibilities include:

- annually reviewing and approving corporate goals and objectives relevant to the compensation of our chief executive officer;
- evaluating the performance of our chief executive officer in light of such corporate goals and objectives and determining the compensation of our chief executive officer;
- reviewing and approving the compensation of our other executive officers;
- appointing, compensating and overseeing the work of any compensation consultant, legal counsel or other advisor retained by the compensation committee;
- conducting the independence assessment outlined in Nasdaq rules with respect to any compensation consultant, legal counsel or other advisor retained by the compensation committee;

- annually reviewing and reassessing the adequacy of the committee charter in its compliance with the listing requirements of Nasdaq;
- reviewing and establishing our overall management compensation, philosophy and policy;

11

- overseeing and administering our compensation and similar plans;
- reviewing and approving our policies and procedures for the grant of equity-based awards;
- reviewing and making recommendations to the board of directors with respect to director compensation;
- reviewing and discussing with management the compensation discussion and analysis to be included in our annual proxy statement or Annual Report on Form 10-K; and
- reviewing and discussing with the board of directors corporate succession plans for the chief executive officer and other key officers.

Historically, our compensation committee has made most of the significant adjustments to annual compensation, determined bonus and equity awards and established new performance objectives at one or more meetings held during the last quarter of the year. However, our compensation committee also considers matters related to individual compensation, such as compensation for new executive hires, as well as high-level strategic issues, such as the efficacy of the Company's compensation strategy, potential modifications to that strategy and new trends, plans or approaches to compensation, at various meetings throughout the year. Generally, the compensation committee's process comprises two related elements: the determination of compensation levels and the establishment of performance objectives for the current year. For executives other than the chief executive officer, our compensation committee solicits and considers evaluations and recommendations submitted to the compensation committee by the chief executive officer. In the case of the chief executive officer, the evaluation of his performance is conducted by the compensation committee, which determines any adjustments to his compensation as well as awards to be granted. For all executives and directors as part of its deliberations, the compensation committee may review and consider, as appropriate, materials such as financial reports and projections, operational data, tax and accounting information, tally sheets that set forth the total compensation that may become payable to executives in various hypothetical scenarios, executive and director stock ownership information, company stock performance data, analyses of historical executive compensation levels and current Company-wide compensation levels and recommendations of our Vice President, Human Resources, including analyses of executive and director compensation paid at a peer group of other companies approved by our compensation committee.

Nominating and Corporate Governance Committee

Our nominating and corporate governance committee is composed of Dr. Gillis, Dr. Mandell and Dr. Schenkein, with Dr. Schenkein serving as chairman of the committee. Our board of directors has determined that each member of the nominating and corporate governance committee is "independent" as defined under the applicable listing standards of Nasdaq. During fiscal year ended December 31, 2014, the nominating and corporate governance committee met three times. The nominating and corporate governance committee's responsibilities include:

- developing and recommending to the board of directors criteria for board and committee membership;
- establishing procedures for identifying and evaluating board of director candidates, including nominees recommended by stockholders;
- identifying individuals qualified to become members of the board of directors;
- recommending to the board of directors the persons to be nominated for election as directors and to each of the board's committees;
- developing and recommending to the board of directors a set of corporate governance guidelines; and
- overseeing the evaluation of the board of directors and management. Our board of directors may establish other committees from time to time.

Identifying and Evaluating Director Nominees

Our board of directors 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 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 of directors. 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. 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.

Non-Management Director Meetings

In addition to the meetings of the committees of the board of directors described above, in connection with the board of directors meetings, the non-management directors met four times in executive session during the fiscal year ended December 31, 2014. The Chairman of the board of directors presides at these executive sessions. The audit committee and the board of directors have established a procedure whereby interested parties may make their concerns known to non-management directors, which is described on our website.

Leadership structure and risk oversight

Our board of directors is currently chaired by Mr. Lynch. As a general policy, our board of directors believes that separation of the positions of chairman and chief executive officer reinforces the independence of the board of directors from management, creates an environment that encourages objective oversight of management's performance and enhances the effectiveness of the board of directors as a whole. As such, Mr. Leschly serves as our president and chief executive officer while Mr. Lynch serves as our chairman of the board of directors but is not an officer.

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

Each of our board committees also oversees the management of our company's risk that falls within the committee's areas of responsibility. In performing this function, each committee has full access to management, as well as the ability to engage advisors. Our chief financial officer, general counsel and principal accounting officer 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 of directors regarding these activities.

Compensation committee interlocks and insider participation

None of the members of our compensation committee has at any time during the prior three years been one of our officers or employees. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our board of directors or compensation committee. For a description of transactions between us and members of our compensation committee and affiliates of such members, please see "Certain relationships and related party transactions."

PROPOSAL NO. 2—ADVISORY VOTE ON EXECUTIVE COMPENSATION

The Board of Directors of the Company 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 of Directors 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 Compensation—Compensation Discussion and Analysis," 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 above, the Board of Directors 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 2015 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 of Directors or the Compensation Committee and neither the Board of Directors 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 NO. 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 the Section 14A(a)(2) of the Exchange Act, the Board of Directors 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.

Consistent with the Company compensation philosophy, the Company's executive compensation program promotes both short and long term incentives, especially given the long timelines and risks inherent in the Company's business of pharmaceutical research and development.

We believe that setting a three (3) year period (triennial) for holding this stockholder vote will provide our stockholders with sufficient time to evaluate the effectiveness of our named executive officer compensation program, and its short- and long-term elements, and the related business results of our company. As described below in our Compensation Discussion and Analysis, our named executive officer compensation program is comprised of a balance of short-term and long-term incentives, with a significant part being based on long-term performance that is designed to support long-term value creation and is thus aligned with our stockholders' interests. As a significant portion of our named executive officer compensation program is derived from equity compensation that rewards long-term performance, as is typical of companies in the biotechnology industry, we also believe that a triennial vote would align more closely with the long-term period that we use to reward long-term performance through our named executive officer compensation program, which is more appropriately reflected with a three (3) year timeframe. From our perspective, such a triennial period for an advisory vote will enhance stockholder communication by providing a clear, simple means for our company to obtain information on investor sentiment about our named executive officer compensation program. Similarly, we believe that a three (3) year vote cycle would give our board of directors and compensation committee sufficient time to thoughtfully understand and consider the results of our non-binding stockholder advisory vote and to implement any corresponding changes to our executive officer compensation program.

For the reasons discussed above, the Board of Directors recommends that stockholders vote to hold the advisory vote on executive compensation every three years. Stockholders are not voting, however, to approve or disapprove of this particular recommendation. The proxy card provides for four choices and stockholders are entitled to vote on whether the advisory vote on executive compensation should be held every one, two, or three years, or to abstain from voting.

As this vote is advisory, it will not be binding upon the Board of Directors and the Board of Directors may decide that it is in the best interest of our stockholders to hold an advisory vote on executive compensation more or less frequently than the frequency receiving the most votes cast by our stockholders. However, the Board of Directors will carefully consider the outcome of this vote when considering the frequency of future advisory votes on executive compensation.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE

TO

HOLD THE ADVISORY VOTE ON EXECUTIVE COMPENSATION EVERY THREE YEARS

(PROPOSAL 3 ON YOUR PROXY CARD)

EXECUTIVE OFFICER AND DIRECTOR COMPENSATION

Compensation Discussion and Analysis

Our compensation committee is responsible for overseeing the total compensation of our senior management team, which is comprised of our executive officers and two other senior managers. In this capacity, our compensation committee designs, implements, reviews and approves all compensation for our chief executive officer and our other named executive officers. This section discusses the principles underlying our policies and decisions with respect to the compensation of our executive officers who are named in the Summary Compensation Table below, or our “named executive officers,” and all material factors relevant to an analysis of these policies and decisions. Our named executive officers are:

- Nick Leschly, our President and Chief Executive Officer;
- Jeffrey T. Walsh, our Chief Operating Officer;
- Mitchell H. Finer, Ph.D., our Chief Scientific Officer;
- David Davidson, M.D., our Chief Medical Officer;
- James M. DeTore, our Chief Financial Officer, Treasurer and Principal Financial Officer; and
- Jason F. Cole, Esq., our Senior Vice President, General Counsel and Secretary.

Executive Summary and Corporate Background

We are a clinical-stage biotechnology company committed to developing potentially transformative gene therapies for severe genetic and rare diseases and in the field of T cell-based immunotherapy. With our lentiviral-based gene therapy and gene editing capabilities, we have built an integrated product platform with broad potential application in these areas.

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 and that the total compensation paid to each of our named executive officers is fair, reasonable and competitive. Key elements of our compensation programs include:

- base salary, to enable us to attract and retain the talent needed to continue to drive our business successfully;
 - an annual cash incentive program, tied to the achievement of pre-determined quantitative and qualitative corporate performance goals; and
 - equity incentive compensation, which is provided to all employees, is typically subject to multi-year vesting based on continued service and is primarily in the form of stock options, the value of which depends on the performance of our common stock price, in order to align employee interests with those of our stockholders over the longer-term.
- We target total cash compensation for our executives at or of 35% of the market median and total equity incentive compensation of 75% of the market median, in each case compared to compensation paid to similarly situated executives of the companies in our peer group, however, because we have a pay-for-performance philosophy, actual compensation levels are correlated to the achievement of corporate and individual goals.

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

- We do not offer any tax gross-up payments to our executive team for any change-of-control payments;
- We prohibit our executive team from engaging in hedging transactions with our securities or pledging our securities; and
- We do not offer our executive team any substantially enhanced benefits or perquisites when compared to our overall employee population.

As described below, during 2014, we made significant progress on our clinical development and business goals, including:

- Initiating our Northstar study in the US, Australia and Thailand and enrolling our Starbeam and HGB-205 clinical trials and reporting positive preliminary clinical data from the Northstar and HGB-205 clinical trials at two major medical meetings;
- Advancing our CAR-T oncology research program and nominating an initial candidate for clinical development;
- Scaling up our global vector and drug product manufacturing capabilities and infrastructure and quality systems and controls;

17

- Developing global regulatory and development acceleration plans for Lenti-D and LentiGlobin;
- Acquiring Precision Genome Engineering, Inc. in June 2014 to access a leading gene editing technology platform;
- Completing two equity financings for approximately \$353 million in net proceeds to bluebird; and
- Hiring over 50 new employees and adding two new experienced Board members.

In addition, as a result of positive clinical results and strong business progress, our stock price appreciated over 437% during 2014. Based on our performance during 2014, our board determined that we achieved 130% of our corporate goals for 2014, which allows us to focus our efforts and further advance our programs and business goals in 2015.

Determining and Setting Executive Compensation

We develop our compensation programs after reviewing publicly available compensation data and subscription survey data for our peer group, provided by Radford Consulting, or Radford, a compensation consulting firm engaged by our compensation committee. Our compensation committee has assessed the independence of Radford consistent with NASDAQ listing standards and has concluded that the engagement of Radford does not raise any conflict of interest.

Defining and Comparing Compensation to Market Benchmarks

In evaluating the total compensation of our named executive officers, our compensation committee, using information provided by Radford, establishes a peer group of publicly traded, national and regional companies in the biopharmaceutical and biotechnology industries that is selected based on a balance of the following criteria:

- companies whose number of employees, stage of development and market capitalization are similar, though not necessarily identical, to ours;
- companies with similar executive positions to ours;
- companies against which we believe we compete for executive talent; and
- public companies based in the United States whose compensation and financial data are available in proxy statements or through widely available compensation surveys.

Based on these criteria, our peer group for 2014, referred to as our 2014 peer group, was approved by our compensation committee and was comprised of the following companies:

| | | |
|------------------------------|----------------------------------|-------------------------------|
| ACADIA Pharmaceuticals, Inc. | Dynavax Technologies, Inc. | Portola Pharmaceuticals, Inc. |
| Accelaron Pharma, Inc. | Epizyme, Inc. | PTC Therapeutics, Inc. |
| AcelRx Pharmaceuticals, Inc. | Kythera Biopharmaceuticals, Inc. | Sangamo Biosciences, Inc. |
| Agios Pharmaceuticals, Inc. | Lexicon Pharmaceuticals, Inc. | Sunesis Pharmaceuticals, Inc. |
| Anacor Pharmaceuticals, Inc. | MacroGenics, Inc. | Tesaro, Inc. |
| Celldex Therapeutics, Inc. | Merrimack Pharmaceuticals, Inc. | ZIOPHARM Oncology, Inc. |
| Clovis Oncology, Inc. | New Link Genetics, Inc. | |

We believe that the compensation practices of our 2014 peer group provided us with appropriate compensation benchmarks for evaluating the compensation of our named executive officers during 2014. Notwithstanding the similarities of the 2014 peer group to bluebird, due to the nature of our business, we compete for executive talent with many public companies that are larger and more established than we are or that possess greater resources than we do,

or with smaller private companies that may be able to offer greater equity compensation potential, as well as with prestigious academic and non-profit institutions. Accordingly, in 2014, our compensation committee generally targeted compensation for our executive officers as follows:

- base salaries at approximately the 35th percentile of the salaries in our 2014 peer group;
- annual cash incentive award opportunities at approximately the 50th percentile of our 2014 peer group;
- total annual equity incentive awards, provided entirely in the form of stock options with value tied to stock price appreciation, at or above the 75th percentile of our 2014 peer group; and

18

·total compensation for our executives is targeted at the 50th percentile of compensation paid to similarly situated executives of the companies in our 2014 peer group.

Our compensation committee may consider other criteria, including market factors, the experience level of the executive and the executive's performance against established corporate goals, in determining variations to this general target range.

Other Key Performance Factors in Determining Executive Compensation

As the biopharmaceutical industry is characterized by a very long product development cycle, including a lengthy research and development period and a rigorous approval phase involving human testing and governmental regulatory approval, many of the traditional benchmarking metrics, such as product sales, revenues and profits are inappropriate for a development-stage biopharmaceutical company, such as bluebird. Instead, the specific performance factors our compensation committee considers when determining the compensation of our named executive officers include:

- key research and development achievements, including advances in our gene therapy and CAR-T technology platforms;
- initiation and progress of clinical trials for our product candidates;
- expansion of our manufacturing and operational capabilities on a global basis;
- achievement of regulatory milestones;
- establishment and maintenance of key strategic relationships and new business initiatives including financings; and
- development of organizational capabilities and managing our growth.

These performance factors are considered by our compensation committee in connection with our annual performance reviews described below and are a critical component in the determination of annual cash and equity incentive awards for our executives.

Annual Performance Reviews

Our compensation committee conducts an annual performance review of our named executive officers and approves the compensation of each member of our senior management team. By the first quarter of each year, annual corporate goals and individual performance objectives are determined and set forth in writing. After the end of each year, our compensation committee determines executive compensation levels after carefully reviewing overall corporate performance and performing an evaluation of each named executive officer's annual performance against established corporate goals, as well as each individual executive officer's contributions to achievement of the corporate goals and, in the case of executive officers other than our chief executive officer, the achievement of individual performance objectives. In addition, our compensation committee may apply its discretion, as it deems appropriate, in determining executive compensation.

Annual corporate goals are proposed by our senior management team and approved by our board. For 2014, our chief executive officer's bonus was entirely on performance relative to corporate goals and the bonus of our other named executive officers was based 90% on corporate goals and 10% on individual objectives. Individual objectives for 2014 for our senior management team focused on individual contributions that were intended to drive achievement of the corporate goals and were proposed by each member of senior management, with review and input from our chief executive officer. Any merit increases in base salary and any annual stock option awards or cash awards made under our 2014 annual incentive program were based on the achievement of these corporate and individual performance goals and objectives. In 2014, our compensation committee established the cash bonus opportunity for each member of our senior management team under the 2014 annual incentive program, representing a percentage of each individual's base salary.

During the last quarter of each year, our senior management team evaluates our corporate performance and each executive officer's individual performance, as compared to the corporate goals and, as applicable, the individual objectives for that year. Based on this evaluation, our chief executive officer recommends to our compensation committee any increases in base salary and any annual stock option awards and/or cash awards under our annual incentive program. Our compensation committee, with input from the board of directors, evaluates our chief executive officer's individual performance and determines whether to change his base salary, grant him an annual stock option award and/or grant him a cash award under our annual incentive program. Our compensation committee typically grants annual stock option awards, and determines changes in base salary and the amount of any cash incentive payments, at its first regularly scheduled meeting of the new year. Our compensation committee may also review the compensation of our executive officers throughout the course of the year. With respect to year-end reviews, any changes in base salary are effective at the beginning of the following year. The cash incentive payments awarded under our 2014 annual incentive program were paid in February 2015.

Compensation Objectives and Philosophy

Our compensation programs are designed to attract, motivate and retain qualified and talented executives, motivating them to achieve our business goals and rewarding them for superior short- and long-term performance. In particular, our compensation programs are intended to reward the achievement of specified pre-determined quantitative and qualitative individual and corporate performance goals and objectives and to align the interests of our senior management team with those of our stockholders in order to attain our ultimate objective of increasing stockholder value.

We award annual merit-based increases in base salary based upon an assessment of each executive's performance and the scope of his or her responsibilities. Our 2014 annual incentive program was designed to reward annual achievements as measured against pre-determined quantitative and qualitative corporate performance goals, and, with respect to members of our senior management team other than our chief executive officer, individual objectives. We awarded cash incentive payments to our named executive officers and the other members of our senior management team under our 2014 annual incentive program, which is described in more detail below.

We typically grant stock options to our executive officers upon commencement of their employment, annually following a review of their individual performance and in connection with a promotion. With the exception of our 2014 annual cash incentive program, we do not have any pre-established targets for allocations or apportionment by type of compensation. The mix of compensation components is designed to reward annual results as well as drive long-term company performance and create stockholder value.

Base Salary

We provide base salaries to our named executive officers to compensate them with a fair and competitive base level of compensation for services rendered during the year. Our compensation committee typically determines the base salary for each executive based on the executive's responsibilities, experience and, if applicable, the base salary level of the executive prior to joining bluebird. In addition, our compensation committee reviews and considers the level of base salary paid by companies in our peer group for similar positions. Generally, our compensation committee believes our executives' base salaries should be targeted at approximately the 3rd percentile of the salaries in our peer group.

Merit-based increases in base salary for all of our executive officers, other than our chief executive officer, are determined by our compensation committee based upon a written summary of the executive officer's performance and a recommendation from our chief executive officer. Any merit-based increase in base salary for our chief executive officer is based upon an assessment of his performance by our compensation committee, input from the board or directors and a review by our compensation committee of the base salary of chief executive officers in our peer group.

With respect to Mr. Leschly, our chief executive officer, at the beginning of 2014, our compensation committee reviewed Mr. Leschly's overall compensation and determined, based on his accomplishments during the year and the comparison to the base salary of chief executive officers in our peer group, to increase his annual base salary to \$425,000 from \$390,000.

At the beginning of 2014, our compensation committee approved merit increases in base salary for each of our other named executive officers serving at that time, based upon the company's performance against the 2013 corporate goals, as well as each executive officer's achievement of individual goals. The table below sets forth the adjustments to base salary, in dollars and as a percentage, for each of our named executive officers serving at the beginning of 2014:

Base Salary Adjustments

| | 2013 | 2014 | |
|--------------------------|-------------|-------------|--------------|
| Name | Base Salary | Base Salary | Increase (%) |
| Nick Leschly | \$390,000 | \$425,000 | 9.0% |
| Jeffrey T. Walsh | \$320,000 | \$328,000 | 2.5% |
| Mitchell H. Finer, Ph.D. | \$306,000 | \$316,000 | 3.25% |
| David Davidson, M.D. | \$315,000 | \$330,000 | 4.75% |

In March 2014, Mr. Jason F. Cole, Esq. joined bluebird as Senior Vice President, General Counsel and Secretary, and based on his experience and an assessment of base salaries of General Counsels at our peer and similar companies, his annual base salary was set at \$315,000 and he was provided a one-time signing bonus of \$35,000. In November 2014, Mr. James DeTore joined bluebird as Chief Financial Officer and Treasurer, and based on his experience and an assessment of base salaries of Chief Financial Officers at our peer and similar companies, his annual base salary was set at \$320,000 and he was provided a one-time signing bonus of \$50,000.

2014 Annual 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 February 2014, our compensation committee approved the annual incentive program for 2014, including the opportunity for eligible participants to achieve incentive awards above established bonus targets based on the company's performance against 2014 corporate goals.

The table below shows the target award under the incentive program as a percentage of each named executive officer's annual base salary in 2014, the maximum cash award opportunity in dollars for 2014 and the actual cash bonus payments to our named executive officers for 2014 performance, which were paid in February 2015, as well as the actual bonus payment as a percentage of the maximum award opportunity. Mr. DeTore is not in the table below because he was not eligible to participate in the 2014 annual incentive program due to his employment start date in November 2014. The details regarding the determination of these cash bonus awards are discussed below.

2014 Annual Incentive Program

| Name | 2014 Target Award (% of Base Salary) | 2014 Target Opportunity (\$) | 2014 Actual Bonus Payment | |
|--------------------------|---|------------------------------|--------------------------------|---------------------------|
| | | | 2014 Actual Bonus Payment (\$) | (% of Target Opportunity) |
| Nick Leschly | 50% | \$ 231,000 | \$ 303,875 | 132% |
| Jeffrey T. Walsh | 40% | \$ 128,000 | \$ 173,184 | 135% |
| Mitchell H. Finer, Ph.D. | 35% | \$ 110,600 | \$ 141,568 | 128% |
| David Davidson, M.D. | 35% | \$ 115,500 | \$ 149,573 | 130% |
| Jason F. Cole, Esq.(1) | 35% | \$ 91,875 | \$ 117,600 | 128% |

(1)Mr. Cole's 2014 award opportunity and actual award payment were prorated based on his employment start date in March 2014.

Under the 2014 annual incentive program, bonus awards were determined by first establishing a bonus pool. The bonus pool was calculated by aggregating the maximum awards for all eligible plan participants and then multiplying that sum by a modifier established by our compensation committee based on our performance as measured against the 2014 corporate goals. The bonus pool was then allocated among all of the plan participants in accordance with the terms of the 2014 annual incentive program. For 2014, our chief executive officer's bonus was entirely based on performance relative to corporate goals and the bonus of our other named executive officers was based 90% on corporate goals and 10% on individual objectives. In addition, our compensation committee had the discretion under the 2014 annual incentive program to adjust upward or downward any bonus award and/or the bonus pool as it deemed appropriate.

In making its determination regarding awards under the 2014 annual incentive program, our compensation committee considered our success against our 2014 corporate goals. The 2014 corporate goals approved by our board, the relative weightings assigned to each goal at the beginning of the year, and management’s recommendation regarding our actual achievement during the performance period as a percentage of target and the weighted performance against these corporate goals for 2014, were as follows:

| | Relative | Actual Achievement For 2014 | Weighted Performance (as a % of target) |
|---|-----------------|--------------------------------------|---|
| 2014 Corporate Goals | Relative | Actual | Weighted |
| • Maximize number of clinical subjects treated and advancement of pipeline | 45% | 105% | 47.25% |
| • Maximize number of treated subjects in new and active clinical trials, including: | | | |
| • Starbeam Study of Lenti-D product candidate for CCALD | | | |
| • Northstar, HGB-205 and HGB-206 studies of LentiGlobin product candidate for - | | | |
| • Thalassaemia and Severe Sickle Cell disease | | | |
| • Two presentations or posters of LentiGlobin clinical data at a major medical meeting | | | |
| • Nominate first CAR-T product candidate for development | | | |
| • Expand core capabilities to support rapid transition to pivotal or commercial development, including: | 25% | 100% | 25% |
| • Scale up of LentiGlobin vector manufacturing | | | |
| • Treatment and follow up of clinical subjects from around the world | | | |
| • Develop global regulatory and development acceleration plans and establish core infrastructure | | | |
| • Continue to validate and leverage our platform and expertise to develop gene therapies for new indications, including by: | 20% | 150% | 30% |
| • Completing a major platform or technology transaction focused on new product opportunities | | | |

- Raising additional capital through equity financings or business development transactions
- Staying in front of our growth by executing on our hiring

| | | | |
|---|------|------|--------|
| plans and managing regrettable turnover | 10% | 125% | 12.5% |
| Approved 2014 Corporate Performance Level | 100% | | 114.75 |

Specifically, during 2014, we made significant progress on our clinical development and business goals, including:

- Initiating our Northstar study in the US, Australia and Thailand and enrolling our Starbeam and HGB-205 clinical trials and reporting positive preliminary clinical data from the Northstar and HGB-205 clinical trials at two major medical meetings;
- Advancing our CAR-T oncology research program and nominating an initial candidate for clinical development;
- Scaling up our global vector and drug product manufacturing capabilities and infrastructure and quality systems and controls;
- Developing global regulatory and development acceleration plans for Lenti-D and LentiGlobin;
- Acquiring Precision Genome Engineering, Inc. in June 2014 to access a leading gene editing technology platform;
- Completing two equity financings for approximately \$353 million in net proceeds to bluebird; and
- Hiring over 50 new employees, including a new Chief Financial Officer and General Counsel and adding two new experienced Board members.

In addition, as a result of positive clinical results and strong overall business progress, our stock price appreciated over 437% during 2014. Based on our overall performance during 2014 and the value created for our stockholders, our board utilized its discretion to determine that we achieved 130% of our corporate goals for 2014, which allows us to focus our efforts and further advance our programs and business goals in 2015.

Equity Awards

Our equity awards program is designed to:

- reward demonstrated leadership and performance;
- align our executive officers' interests with those of our stockholders;
- retain our executive officers through the term of the awards;
- maintain competitive levels of executive compensation; and
- motivate our executive officers for outstanding future performance.

The market for qualified and talented executives in the biopharmaceutical industry is highly competitive and we compete for talent with many companies that have greater resources than we do. Accordingly, we believe equity compensation is a crucial component of any competitive executive compensation package we offer.

Historically, our equity awards have generally taken the form of stock options. We typically grant stock options to each of our executive officers upon commencement of employment, annually in conjunction with our review of individual performance, in connection with a promotion or as a special incentive.

All stock option awards to our executive officers are approved by our compensation committee and, other than stock option awards to new hires, are typically granted at our compensation committee's regularly scheduled meeting at the beginning of the year. Stock option awards vary among our executive officers based on their positions and annual performance assessments. In addition, our compensation committee reviews all components of the executive's compensation to ensure that his or her total compensation is aligned with our overall philosophy and objectives. All stock options granted to our executives have exercise prices equal to the fair market value of our common stock on the date of grant, so that the recipient will not earn any compensation from his or her options unless our share price increases above the exercise price on the date of grant. Accordingly, this portion of our executive officers' compensation is at risk and is directly aligned with stockholder value creation.

In addition, the stock options granted to our executive officers typically 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 with bluebird. Typically, the stock options we grant to our executives have a ten-year term and vest as to 25% of the shares on the first anniversary of their hire date or January 1 of the year of grant and then monthly thereafter until the fourth anniversary of such date. Vesting of option grants to employees ceases upon termination of employment and exercise rights typically cease three months following termination of employment, 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 option, including voting rights and the right to receive dividends or dividend equivalents.

We do not have any equity ownership guidelines for our executive officers or directors. Our insider trading policy expressly prohibits short sales and derivative transactions of our stock by our named executive officers, directors and specified other employees, including short sales of our securities, including short sales "against the box"; purchases or sales of puts, calls or other derivative securities of the company or any derivative securities that provide the economic equivalent of ownership of any of our securities or an opportunity, direct or indirect, to profit from any change in the value of our securities; 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 named executive officers, directors and specified other 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.

In connection with the annual review of each executive officer's individual performance and consistent with our compensation philosophy, in February 2014, our compensation committee approved annual equity incentive awards for our named executive officers serving at that time. The annual incentive awards granted to our named executive

officers serving at that time are set forth in the table below:

| 2014 Annual Equity Incentive Awards | |
|-------------------------------------|--------------|
| Name | Option Award |
| Nick Leschly | 165,000 |
| Jeffrey T. Walsh | 50,000 |
| Mitchell H. Finer, Ph.D. | 55,000 |
| David Davidson, M.D. | 65,000 |

In March 2014, Mr. Cole joined bluebird as Senior Vice President, General Counsel and Secretary, and based on his experience and an assessment of equity compensation of General Counsels at our peer and similar companies, in April 2014 he was granted a stock option award for 100,000 shares of our common stock. In November 2014, Mr. DeTore joined bluebird as Chief Financial Officer and Treasurer, and based on his experience and an assessment of equity compensation of Chief Financial Officers at our peer and similar companies, in December 2014 he was granted a stock option award for 100,000 shares of our common stock.

In May 2014, Mr. Walsh and Dr. Finer were each granted a stock option award exercisable for 10,000 shares of our common stock, with performance-based vesting criteria based on the timely completion of certain business development activities. These activities were not completed in 2014 as required for vesting, so these stock options were cancelled in accordance with their terms during 2014 and do not appear in the Outstanding Equity Awards at December 31, 2014 table below.

The number of stock options granted to our named executive officers during 2014, and the grant date fair value of those awards determined in accordance with Financial Accounting Standards Board, or FASB, Accounting Standards Codification, or ASC, Topic 718, are shown in the 2014 Grants of Plan-Based Awards table below.

Benefits and Other Compensation

Other compensation to our executives consists primarily of the broad-based benefits we provide to all full-time employees in the United States, including medical, dental and vision insurance, group life and disability insurance, an employee stock purchase plan and a 401(k) plan. Pursuant to our 401(k) plan, employees may elect to reduce their current compensation by up to the statutorily prescribed annual limit (which was \$17,500 in 2014), with additional salary deferrals not to exceed \$5,500 available to those employees 50 years of age or older, and to have the amount of this reduction contributed to our 401(k) plan. We do not provide significant perquisites or personal benefits to our named executive officers.

Base Salary Compensation for Our Named Executive Officers in 2015

With respect to Mr. Leschly, our chief executive officer, at the beginning of 2015, our compensation committee reviewed Mr. Leschly's overall compensation and determined, based on his accomplishments during the year and the comparison to the base salary of chief executive officers in our peer group, to increase his annual base salary to \$460,000 from \$425,000.

At the beginning of 2015, our compensation committee approved merit increases in base salary for each of our remaining named executive officers serving at that time, based upon the company's performance against the 2014 corporate goals, each executive officer's achievement of individual goals and the comparison to the base salary of similar executive officers in our peer group. The table below sets forth the adjustments to base salary, in dollars and as a percentage, for each of our named executive officers serving at the beginning of 2015:

Base Salary Adjustments

| Name | 2014 Base Salary | 2015 Base Salary | Increase (%) |
|--------------------------|------------------|------------------|--------------|
| Nick Leschly | \$ 425,000 | \$ 460,000 | 8.25% |
| Jeffrey T. Walsh | \$ 328,000 | \$ 350,000 | 6.7% |
| Mitchell H. Finer, Ph.D. | \$ 316,000 | \$ 335,000 | 6.0% |
| David Davidson, M.D. | \$ 330,000 | \$ 360,000 | 9.0% |

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| | | | |
|-------------------------|------------|------------|------|
| James M. DeTore (1) | \$ 320,000 | \$ 320,000 | 0% |
| Jason F. Cole, Esq. (2) | \$ 315,000 | \$ 323,000 | 2.5% |

(1)Mr. DeTore's 2015 base salary was not adjusted because of his employment start date in November 2014.

(2)Mr. Cole's 2015 base salary adjustment was prorated based on his employment start date in March 2014.

Cash Incentive Compensation for Our Named Executive Officers in 2015

In February 2015, our compensation committee approved the annual incentive program for 2015. The terms of the 2015 annual incentive program are substantially the same as the 2014 annual incentive program. The 2015 annual incentive program includes an opportunity for eligible participants to achieve their target award percentage based on the achievement of our 2015 corporate goals. This potential upside achievement allows us to better align our cash incentive awards with market practice while reflecting our commitment to closely managing our cash reserves.

The table below shows the target award under the incentive program as a percentage of each named executive officer's annual base salary in 2015, as well as the target cash award opportunity in dollars for 2015. Dr. Mitchell Finer, our Chief Scientific Officer is not an eligible participant in our 2015 annual incentive program due to his planned transition of employment in July 2015.

| 2015 Annual Incentive Program | | |
|-------------------------------|--------------------|------------------|
| | 2015 | 2015 |
| | Target Award | Target Award |
| Name | (% of Base Salary) | Opportunity (\$) |
| Nick Leschly | 55% | \$ 253,000 |
| Jeffrey T. Walsh | 40% | \$ 140,000 |
| David Davidson, M.D. | 35% | \$ 126,000 |
| James M. DeTore | 35% | \$ 112,000 |
| Jason F. Cole, Esq. | 35% | \$ 113,050 |

In determining the 2015 cash incentive compensation for our named executive officers under the 2015 annual incentive program, our compensation committee will review the performance of the company during 2015. Our compensation committee retains the discretion under the 2015 annual incentive program to adjust upward or downward any bonus award or the bonus pool as it deems appropriate. We expect to pay any cash incentive awards made under our 2015 annual incentive program in February 2016.

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.

Stock Option Granting Practices

Delegation to Our Chief Executive Officer

Currently, all of our employees, including our named executive officers, are eligible to participate in our 2013 Stock Option and Incentive Plan, or the 2013 Plan. All new full-time employees are granted stock options when they start employment and all continuing employees are eligible for stock option awards on an annual basis based on performance and upon promotions to positions of greater responsibility. Our compensation committee has delegated to Mr. Leschly, our chief executive officer, the authority to make stock option awards under our 2013 Plan to new hires

and in connection with promotions, other than grants to vice presidents and executive officers. The number of stock options he may grant to any one individual must be within the range specifically set by our compensation committee for these awards. The exercise price of such stock options must be equal to the closing price of our common stock on The NASDAQ Global Market on the first business day of the calendar month following the date of hire or promotion. With respect to stock option awards to new hires other than vice presidents and executive officers, Mr. Leschly approves the award prior to the employee's first date of employment with such authority and provides that the award is to be granted to the new hire on the first business day of the calendar month following the date of his or her first date of regular employment. With respect to stock option awards made in connection with promotions other than of vice presidents and executive officers, Mr. Leschly approves the award in connection with such promotion and provides that the award is to be granted on the first business day of the calendar month following the date of such promotion. Mr. Leschly is required to maintain a list of stock options granted pursuant to such delegated authority and report to our compensation committee regarding such awards.

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 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, 2014, which was filed with the SEC on February 25, 2015.

By the compensation committee of the board of directors of bluebird bio,

Daniel Lynch, Chair

Wendy Dixon, Ph.D.

John Maraganore, Ph.D.

Robert Tepper, M.D. (through July 2014)

Executive Compensation

Summary Compensation Table

The following table sets forth the compensation earned during the fiscal years ended December 31, 2014, December 31, 2013 and December 31, 2012 for our chief executive officer and our next five highest-paid executive officers as of December 31, 2014. We refer to these officers as our named executive officers.

| Name and Principal Position | Year | Salary (\$) | Option Awards (\$) | Bonus (\$) | Non-equity | |
|---|------|-------------|--------------------|-------------|----------------------------------|------------|
| | | | | | incentive plan compensation (\$) | Total (\$) |
| Nick Leschly President and Chief Executive Officer | 2014 | 440,404 | 2,875,111 | — | 303,875 (2) | 3,619,390 |
| | 2013 | 392,538 | 1,844,454 | — | 234,000 (2) | 2,470,992 |
| | 2012 | 346,085 | 130,738 | — | 124,200 (4) | 601,023 |
| Jeffrey T. Walsh Chief Operating Officer | 2014 | 340,400 | 1,014,046 | — | 173,184 (2) | 1,527,630 |
| | 2013 | 321,692 | 395,790 | — | 147,840 (2) | 865,322 |
| | 2012 | 300,758 | — | — | 108,000 (4) | 408,758 |
| Mitchell H. Finer, Ph.D. Chief Scientific Officer(5) | 2014 | 327,885 | 1,101,170 | — | 141,568 (2) | 1,570,623 |
| | 2013 | 307,177 | 640,435 | — | 126,378 (2) | 1,073,990 |
| David Davidson, M.D. Chief Medical Officer | 2014 | 342,289 | 1,132,620 | — | 149,573 (2) | 1,624,482 |
| | 2013 | 315,000 | 395,790 | — | 132,300 (3) | 843,090 |
| | 2012 | 260,456 | 223,857 | 45,000 (6) | 82,156 (4) | 611,469 |
| James M. DeTore (7) Chief Financial Officer & Treasurer | 2014 | 49,231 | 2,643,741 | 50,000 (8) | — | 2,742,972 |
| Jason F. Cole, Esq.(9) Senior Vice President, General Counsel & Secretary | 2014 | 262,904 | 1,617,752 | 35,000 (10) | 117,600 (2) | 2,033,256 |

(1) The amounts reported in the “Option awards” column above represent the grant date fair value of the stock options granted to such officers during 2012, 2013 and 2014 as computed in accordance with Accounting Standards Codification, or ASC, Topic 718, not including any estimates of forfeitures related to service-based vesting conditions. See note 13 of “Notes to Consolidated Financial Statements” in our Annual Report on Form 10-K filed with the SEC on February 25, 2015 for a discussion of assumptions made by the Company in determining the grant date fair value of our Option awards for the fiscal years ended December 31, 2014, 2013 and 2012. 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 named executive officers from the options.

(2) Amounts represent cash payment under our annual incentive program earned in 2014, and paid during 2015, based on achievement of performance goals and other factors deemed relevant by our board of directors.

(3)

Amounts represent cash in payment under our annual incentive program earned in 2013, and paid during 2014, based on achievement of performance goals and other factors deemed relevant by our board of directors.

- (4) Amounts represent cash payment under our annual incentive program earned in 2012, and paid during 2013, based on achievement of performance goals and other factors deemed relevant by our board of directors.
- (5) Compensation information is not provided for Dr. Finer for the fiscal year ended December 31, 2012, as Dr. Finer was not a named executive officer as of the end of such fiscal year.
- (6) The amount reported consists of Dr. Davidson's signing bonus.
- (7) Mr. DeTore's employment commenced on November 10, 2014, his annual base salary for 2014 was \$320,000, and he was not eligible to participate in the 2014 annual incentive program.
- (8) The amount reported consists of Mr. DeTore's signing bonus.
- (9) Mr. Cole's employment commenced on March 6, 2014, his annual base salary for 2014 was \$315,000, and his eligibility for the 2014 annual incentive program was prorated for a partial year.
- (10) The amount reported consists of Mr. Cole's signing bonus.

27

Grants of Plan-Based Awards

The following table shows information regarding grants of plan-based awards during the fiscal year end December 31, 2014 to the Company's named executive officers.

| Name and Principal Position | Grant Date | Estimated Future | All Other Option | Exercise or | Grant Date |
|---|------------------------|-----------------------|--------------------------|----------------|--------------------|
| | | Payouts Under | Awards: Number of | Base Price | Fair Value of |
| | | Non-Equity | Securities | of Option | Stock and |
| | | Incentive Plan | Underlying | Awards | Option |
| | | Awards Target (\$)(1) | Options (#) | (S/SH) (2) | Awards (3) |
| Nick Leschly President and Chief Executive Officer | 3/03/2014 | 231,000 — | 165,000(4) | 24.47 | 2,875,111 |
| Jeffrey T. Walsh Chief Operating Officer | 3/03/2014 5/01/2014 | 128,000 — | 50,000 (4) 10,000 (5) | 24.47 19.91 | 871,246 142,800 |
| Mitchell H. Finer, Ph.D. Chief Scientific Officer | 3/03/2014 5/01/2014 | 110,600 — | 55,000 (4) 10,000 (5) | 24.47 19.91 | 958,370 142,800 |
| David Davidson, M.D. Chief Medical Officer | 3/03/2014 | 115,500 — | 65,000 (4) | 24.47 | 1,132,620 |
| James M. DeTore Chief Financial Officer & Treasurer | 12/01/2014 | — (6) | 100,000 (4) | 39.49 | 2,643,741 |
| Jason F. Cole, Esq. SVP, General Counsel & Secretary | 4/01/2014 | 91,875 (7) — | 100,000 (4) | 22.53 | 1,617,752 |

(1) Represents the target amount of each executive's cash payments under our 2014 annual incentive program as established by the Compensation Committee and described in "Compensation Discussion and Analysis" above. Actual payments made for 2014 are provided in the "Summary Compensation Table"

(2) 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 Market on the grant date.

(3) Amounts represents the grant date fair value of the named executive officer's stock options, calculated in accordance with FASB ASC Topic 718, using a Black-Scholes valuation model. For purposes of these calculations, we have disregarded the estimate of forfeitures related to service-based vesting conditions.

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

(5)

Options awarded with performance-based vesting criteria established by the Compensation Committee and described in Compensation Discussion and Analysis above. The vesting criteria were not met in 2014 as required for vesting, so these stock options were cancelled in accordance with their terms during 2014.

(6) Mr. DeTore was not eligible to participate in the 2014 annual incentive program due to his employment start date in November 2014.

(7) Mr. Cole's 2014 award opportunity was prorated based on his employment start date in March 2014.

28

Equity compensation

Outstanding equity awards at December 31, 2014

The following table sets forth information concerning the outstanding equity awards held by each of the named executive officers as of December 31, 2014.

| Name | Option Awards Number of | | Exercise price | Option expiration date |
|--------------------------|-------------------------------|----------------------------|-------------------|------------------------------|
| | exercisable (#) | unexercised options (#) | | |
| Nick Leschly | 27,650 | 10,797 (1) | 2.09 | 7/13/2021 |
| | 34,438 | 32,678 (2) | 2.09 | 6/4/2022 |
| | 14,020 | 19,629 (3) | 5.50 | 1/16/2023 |
| | 32,346 | 49,373 (4) | 5.50 | 1/16/2023 |
| | 78,314 | 85,125 (5) | 5.50 | 1/16/2023 |
| | 23,033 | 25,037 (5) | 5.50 | 1/16/2023 |
| | 54,479 | 99,346 (6) | 5.50 | 1/16/2023 |
| | — | 165,000 (7) | 24.47 | 3/2/2024 |
| Jeffrey T. Walsh | 86,920 | 23,887 (8) | 2.09 | 7/13/2021 |
| | 10,914 | 15,292 (9) | 2.09 | 7/13/2021 |
| | 4,297 | 6,018 (3) | 5.50 | 1/16/2023 |
| | 10,207 | 15,581 (4) | 5.50 | 1/16/2023 |
| | 24,713 | 26,863 (5) | 5.50 | 1/16/2023 |
| | 7,413 | 8,059 (5) | 5.50 | 1/16/2023 |
| | — | 50,000 (7) | 24.47 | 3/2/2024 |
| Mitchell H. Finer, Ph.D. | 19,769 | — | 0.95 | 9/15/2020 |
| | 39,572 | 3,598 (1) | 2.09 | 7/13/2021 |
| | 797 | 1,063 (1) | 2.09 | 7/13/2021 |
| | 532 | 4,516 (11) | 2.09 | 7/13/2021 |
| | 1,098 | 9,337 (2) | 2.09 | 6/4/2022 |
| | 6,876 | 9,628 (3) | 5.50 | 1/16/2023 |
| | 16,332 | 24,930 (4) | 5.50 | 1/16/2023 |
| | 39,542 | 42,982 (5) | 5.50 | 1/16/2023 |
| | 11,862 | 12,895 (5) | 5.50 | 1/16/2023 |
| | 527 (2) | — | 8.16 | 4/29/2023 |

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| | | | | |
|----------------------|--------|--------------|-------|-----------|
| | — | 55,000 (7) | 24.47 | 3/2/2024 |
| David Davidson, M.D. | 21,377 | 45,862 (13) | 2.09 | 4/12/2022 |
| | 10,207 | 15,581 (3) | 5.50 | 1/15/2023 |
| | 4,297 | 6,018 (4) | 5.50 | 1/15/2023 |
| | 24,713 | 26,863 (5) | 5.50 | 1/15/2023 |
| | 7,413 | 8,059 (5) | 5.50 | 1/15/2023 |
| | — | 65,000 (7) | 24.47 | 3/2/2024 |
| James M. DeTore | — | 100,000 (14) | 39.49 | 12/1/2024 |
| Jason F. Cole, Esq. | — | 100,000 (15) | 22.53 | 4/1/2024 |

- (1) Represents options to purchase shares of our common stock granted on July 13, 2011. The shares underlying these options vest as follows: 25% vested on April 15, 2012, with the remainder of the shares vesting in equal monthly installments over the following three years through April 15, 2015.
- (2) Represents options to purchase shares of our common stock granted on June 4, 2012. The shares underlying these options vest as follows: 25% vested on May 1, 2013, with the remainder of the shares vesting in equal monthly installments over the following three years through May 1, 2016.
- (3) Represents options to purchase shares of our common stock granted on January 16, 2013 with performance-based vesting criteria that were met as of April 1, 2013. The shares underlying these options vested as follows: 25% vested on April 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.

- (4) Represents options to purchase shares of our common stock granted on January 16, 2013 with performance-based vesting criteria that were met as of May 1, 2013. The shares underlying these options vested as follows: 25% vested on May 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.
- (5) Represents options to purchase shares of our common stock granted on January 16, 2013 with performance-based vesting criteria that were met as of January 1, 2013. The shares underlying these options vested as follows: 25% vested on January 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.
- (6) Represents options to purchase shares of our common stock granted on January 16, 2013 with performance-based vesting criteria that were met as of June 24, 2013. The shares underlying these options vested as follows: 25% vested on July 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.
- (7) Represents options to purchase shares of our common stock granted on March 2, 2014. The shares underlying these options vest as follows: 25% vested on January 1, 2015, with the remainder of the shares vesting in equal monthly installments over the following three years through January 1, 2018.
- (8) Represents options to purchase shares of our common stock granted on July 13, 2011. The shares underlying these options vest as follows: 25% vested on May 16, 2012, with the remainder of the shares vesting in equal monthly installments over the following three years through May 16, 2015.
- (9) Represents options to purchase shares of our common stock granted on July 13, 2011 with performance-based vesting criteria that were met as of April 1, 2013. The shares underlying these options vested as follows: 25% vested upon April 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.
- (10) Represents options to purchase shares of our common stock granted on September 15, 2010. The shares underlying these options vest as follows: 12.5% vested on the date of grant, with the remainder of the shares vesting in equal monthly installments starting on October 8, 2010 through March 8, 2014.
- (11) Represents options to purchase shares of our common stock granted on July 13, 2011 with performance-based vesting criteria that were met as of May 1, 2013. The shares underlying these options vest as follows: 25% vested on May 1, 2013, with the remainder of the shares vesting in equal monthly installments over the following three years.
- (12) Represents options to purchase shares of our common stock granted on April 29, 2013. The shares underlying these options were fully vested upon grant.
- (13) Represents options to purchase shares of our common stock granted on April 12, 2012. The shares underlying these options vest as follows: 25% vested on February 13, 2013, with the remainder of the shares vesting in equal monthly installments over the following three years through April 12, 2016.
- (14) Represents options to purchase shares of our common stock granted on December 1, 2014. The shares underlying these options vest as follows: 25% vest on November 10, 2015, with the remainder of the shares vesting in equal monthly installments over the following three years through November 10, 2018.
- (15) Represents options to purchase shares of our common stock granted on April 1, 2014. The shares underlying these options vest as follows: 25% vested on March 6, 2015, with the remainder of the shares vesting in equal monthly installments over the following three years through March 6, 2018.

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 year ended December 31, 2014.

| Name | Option Awards | | Stock Awards | |
|--------------------------|---------------------------------------|------------------------------------|--------------------------------------|-----------------------------------|
| | Number of shares acquired on exercise | Value realized on exercise (\$)(1) | Number of shares acquired on vesting | Value realized on vesting (\$)(2) |
| Nick Leschly | 116,266 | 1,865,325 | 68,596 | 1,942,307 |
| Jeffrey T. Walsh | 118,500 | 5,634,412 | — | — |
| Mitchell H. Finer, Ph.D. | 106,518 | 3,445,917 | — | — |
| David Davidson, M.D. | 75,000 | 2,181,904 | — | — |
| James M. DeTore | — | — | — | — |
| Jason F. Cole, Esq. | — | — | — | — |

(1) Value realized on exercise of stock option awards does not represent proceeds from any sale of any common stock acquired upon exercise, but is determined by multiplying the number of shares acquired upon exercise by the difference between the exercise price of the option and the closing price of our common stock on the Nasdaq Global Select Market at each time of exercise.

(2) Value realized on vesting of restricted stock awards does not represent proceeds from the sale of vested common stock, but is determined by multiplying the number of shares that vested on the closing price of our common stock on the Nasdaq Global Select Market on each vesting date.

Employment arrangements with our named executive officers

Nick Leschly. We have entered into an amended and restated employment agreement, effective as of the closing of our initial public offering on June 24, 2013, with Nick Leschly for the position of president and chief executive officer. Mr. Leschly currently receives a base salary of \$460,000, which is subject to adjustment at the discretion of the board of directors. Mr. Leschly is also eligible for an annual performance bonus of up to 55% of his base salary, payable at the discretion of the board of directors. Mr. Leschly is eligible to participate in our employee benefit plans, subject to the terms of those plans.

Jeffrey T. Walsh. We have entered into an amended and restated employment agreement, effective as of the closing of our initial public offering on June 24, 2013, with Jeffrey T. Walsh for the position of chief operating officer. Mr. Walsh currently receives a base salary of \$350,000, which is subject to adjustment at the discretion of the board of directors. Mr. Walsh is also eligible for an annual performance bonus of up to 40% of his base salary, payable at the discretion of the board of directors. Mr. Walsh is eligible to participate in our employee benefit plans, subject to the terms of those plans.

Mitchell H. Finer, Ph.D. We have entered into an amended and restated employment agreement, effective as of the closing of our initial public offering on June 24, 2013, with Mitchell H. Finer for the position of chief scientific officer. Dr. Finer currently receives a base salary of \$335,000, which is subject to adjustment at the discretion of the

board of directors. Dr. Finer is also eligible for an annual performance bonus of up to 35% of his base salary, payable at the discretion of the board of directors. Dr. Finer is eligible to participate in our employee benefit plans, subject to the terms of those plans.

David Davidson, M.D. We have entered into an amended and restated employment agreement, effective as of the closing of our initial public offering on June 24, 2013, with David Davidson for the position of chief medical officer. Dr. Davidson currently receives a base salary of \$360,000, which is subject to adjustment at the discretion of the board of directors. Dr. Davidson is also eligible for an annual performance bonus of up to 35% of his base salary, payable at the discretion of the board of directors. Dr. Davidson is eligible to participate in our employee benefit plans, subject to the terms of those plans.

James M. DeTore. We have entered into an employment agreement, effective as of November 10, 2014, with James M. DeTore for the position of chief financial officer. Mr. DeTore currently receives a base salary of \$320,000, which is subject to adjustment at the discretion of the board of directors. Mr. DeTore is also eligible for an annual performance bonus of up to 35% of his base salary, payable at the discretion of the board of directors. Mr. DeTore is eligible to participate in our employee benefit plans, subject to the terms of those plans.

Jason F. Cole, Esq. We have entered into an employment agreement, effective as of March 6, 2014, with Jason F. Cole for the position of Senior Vice President, General Counsel. Mr. Cole currently receives a base salary of \$323,000, which is subject to adjustment at the discretion of the board of directors. Mr. Cole is also eligible for an annual performance bonus of up to 35% of his base salary, payable at the discretion of the board of directors. Mr. Cole is eligible to participate in our employee benefit plans, subject to the terms of those plans.

These employment agreements also contain provisions that provide for certain payments and benefits in the event of an involuntary termination of employment. In addition, the named executive officers may be entitled to accelerated vesting of their outstanding and unvested awards in certain circumstances. The information below describes certain compensation that may become due payable as a result of certain events. These payments and benefits are in addition to benefits available generally to salaried employees, including an ability to participate in our Section 401(k) plan, and our employee stock purchase plan, accrued benefits under our health and welfare plans and arrangements and vacation pay or other accrued benefits under our medical and dental insurance plans, that are not generally described. Outstanding equity awards for the named executive officers as of December 31, 2014 are set forth under “Outstanding equity awards at December 31, 2014.”

Involuntary termination of employment

Pursuant to their employment agreements, each named executive officer is eligible to receive certain payments and benefits in the event his employment is terminated by us without “cause” (as defined in his employment agreement) or in the event he terminates his employment with “good reason” (as defined in his employment agreement). Upon the timely execution of a severance agreement, including a general release of claims, each named executive officer is eligible to receive the following payments and benefits:

- 12 months of base salary continuation, or nine (9) months of base salary continuation in the case of Mr. Cole; and
- if he elects to continue his group healthcare benefits, to the extent authorized by and consistent with COBRA, we will pay the named executive officer a monthly cash payment equal to the monthly employer contribution we would have made to provide him health insurance if he had remained employed by us until the earlier of (1) 12 months following the date of termination, or nine (9) months in the case of Mr. Cole, or (2) the end of the named executive officer’s COBRA health continuation period.

Sale event

Pursuant to the employment agreements and the award agreements governing equity awards granted to the named executive officers prior to the closing of our initial public offering on June 24, 2013, in the event of a “sale event” of the company (as defined in the 2010 Stock Option and Grant Plan), any such unvested stock options or other stock-based awards will immediately accelerate, vest and become fully exercisable or non-forfeitable as of the effective date of the sale event.

In addition, in the event that any of the named executive officers terminates his employment with us for good reason or his employment with us is terminated by us without cause, in each case within 12 months following a “sale event” (as defined in the 2013 Stock Option and Incentive Plan), he will be entitled to receive the following payments and benefits upon the timely execution of a severance agreement, including a general release of claims:

- a lump sum cash payment equal to one times (or one and a half times in the case of Mr. Leschly, and 0.75 times in the case of Mr. Cole) the sum of (1) the named executive officer’s then-current base salary (or base salary in effect immediately prior to the sale event, if higher) and (2) the named executive officer’s target annual incentive compensation (other than Mr. DeTore and Mr. Cole); and
- if he elects to continue his group healthcare benefits, to the extent authorized by and consistent with COBRA, we will pay the named executive officer a monthly cash payment equal to the monthly employer contribution we would have

made to provide him health insurance if he had remained employed by us until the earlier of (1) 12 months (or 18 months in the case of Mr. Leschly, and nine (9) months in the case of Mr. Cole) following the date of termination or (2) the end of the named executive officer's COBRA health continuation period; and

- all stock options and other stock-based awards granted to the named executive officer after the date of his employment agreement will become fully exercisable and non-forfeitable as of the date of the named executive officer's termination (other than Mr. Cole).

32

Estimated Payment and Benefits Upon Termination or Change of Control

The amount of compensation and benefits payable to each named executive officers in various termination and change in control situations has been estimated in the tables below. The value of the option vesting acceleration was calculated for each of the tables below based on the assumption that the change in control and executive's employment termination occurred on December 31, 2014. The closing price of the Company's stock on the Nasdaq Global Select Market as of December 31, 2014, the last trading day of 2014, was \$91.72, which was used as the value of the Company's stock in the change in control. The value of the option vesting acceleration was calculated by multiplying the number of unvested option shares subject to vesting acceleration as of December 31, 2014 by the difference between the closing price of the Company's stock as of December 31, 2014 and the exercise price for such unvested option shares.

Mr. Nick Leschly

The following table describes the potential payments and benefits upon employment termination for Nick Leschly, the Company's President and Chief Executive Officer, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and Payment upon Termination Compensation: | Voluntary Resignation | | Voluntary Resignation | | Termination by Company | Termination upon a Sale | Termination by Company without Cause or Voluntary Resignation for Good Reason in Connection with or Following Change in Control | | |
|---|-----------------------|-------------------|-----------------------|-------------------|--------------------------|-------------------------|---|------------|----------------------|
| | For Good Reason | For Good Reason | For Good Reason | For Good Reason | by Company not for Cause | By Company for Cause | Event | | |
| Base salary | — | \$ 425,000 | (1) | \$ 425,000 | (1) | — | — | \$ 637,000 | (3) |
| Cash incentive bonus | — | — | — | — | — | — | — | \$ 231,000 | (4) |
| Stock options unvested and accelerated | — | — | — | — | — | — | \$ 24,748,862 | (2) | \$ 35,845,112 (5) |
| Benefits and Perquisites: | | | | | | | | | |
| Health care continuation | — | \$ 21,088 | (6) | \$ 21,088 | (6) | — | — | \$ 31,628 | (7) |
| Total | \$ — | \$ 446,088 | | \$ 446,088 | | \$ — | \$ 24,748,862 | | \$ 36,171,440 |

(1) Twelve months of 2014 base salary continuation

(2) Acceleration of 100% of Mr. Leschly's then unvested options granted under the 2010 Stock Option and Grant Plan.

(3) One and a half times base salary prior to the termination, payable in a lump sum.

- (4) Target bonus for 2014, assuming bonus compensation is fully earned and unpaid.
- (5) Acceleration of 100% of Mr. Leschly's then unvested options
- (6) Payment of the COBRA health and dental insurance premiums for Mr. Leschly and his dependents until the earlier of (a) 12 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.
- (7) Payment of the COBRA health and dental insurance premiums for Mr. Leschly and his dependents until the earlier of (a) 18 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

33

Mr. Jeffrey T. Walsh

The following table describes the potential payments and benefits upon employment termination for Jeffrey T. Walsh, the Company's Chief Operating Officer, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and Compensation: | Voluntary Resignation | | Voluntary Resignation | | Termination by Company | | Termination by Company | | Termination by Company |
|--|-----------------------|-------------------|-----------------------|-------------------|------------------------|-------------|------------------------|----------------------|-----------------------------|
| | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Cause | For Cause | For Cause | For Cause | Following Change in Control |
| Base salary | — | \$ 328,000 | (1) | \$ 328,000 | (1) | — | — | \$ 328,000 | (3) |
| Cash incentive bonus | — | — | — | — | — | — | — | \$ 128,000 | (4) |
| Stock options unvested and accelerated | — | — | — | — | — | — | \$ 8,384,973 | (2) | \$ 11,747,473 (5) |
| Benefits and Perquisites: | | | | | | | | | |
| Health care continuation | — | \$ 21,088 | (6) | \$ 21,088 | (6) | — | — | \$ 21,088 | (6) |
| Total | \$ — | \$ 349,088 | | \$ 349,088 | | \$ — | \$ 8,384,973 | \$ 12,224,561 | |

(1) Twelve months of 2014 base salary continuation

(2) Acceleration of 100% of Mr. Walsh's then unvested options granted under the 2010 Stock Option and Grant Plan.

(3) One times base salary prior to the termination, payable in a lump sum.

(4) Target bonus for 2014, assuming bonus compensation is fully earned and unpaid.

(5) Acceleration of 100% of Mr. Walsh's then unvested options

(6) Payment of the COBRA health and dental insurance premiums for Mr. Walsh and his dependents until the earlier of (a) 12 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

Dr. Mitchell H. Finer

The following table describes the potential payments and benefits upon employment termination for Mitchell H. Finer, the Company's Chief Scientific Officer, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and Compensation: | Voluntary Resignation | | Termination by Company | | Termination by Company upon a Sale | | Termination by Company without Cause or Voluntary Resignation for Good Reason in Connection with or Following Change in Control | |
|--|-----------------------|-------------------|------------------------|-------------|------------------------------------|------------------|---|-----|
| | For Good Reason | For Good Reason | not for Cause | for Cause | for Cause | Event | | |
| Base salary | — | \$ 316,000 (1) | \$ 316,000 (1) | — | — | — | \$ 316,000 | (3) |
| Cash incentive bonus | — | — | — | — | — | — | \$ 110,600 | (4) |
| Stock options unvested and accelerated | — | — | — | — | — | \$ 9,456,746 (2) | \$ 13,155,496 | (5) |
| Benefits and Perquisites: | | | | | | | | |
| Health care continuation | — | \$ 21,088 (6) | \$ 21,088 (6) | — | — | — | \$ 21,088 | (6) |
| Total | \$ — | \$ 337,088 | \$ 337,088 | \$ — | \$ 9,456,746 | | \$ 13,603,184 | |

(1) Twelve months of 2014 base salary continuation

(2) Acceleration of 100% of Dr. Finer's then unvested options granted under the 2010 Stock Option and Grant Plan.

(3) One times base salary prior to the termination, payable in a lump sum.

(4) Target bonus for 2014, assuming bonus compensation is fully earned and unpaid.

(5) Acceleration of 100% of Dr. Finer's then unvested options

(6) Payment of the COBRA health and dental insurance premiums for Dr. Finer and his dependents until the earlier of (a) 12 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

On January 29, 2015, we entered into a Transitional Services and Separation Agreement with Dr. Finer, pursuant to which his employment with the Company will end on July 6, 2015, unless earlier terminated pursuant to Dr. Finer's resignation or termination by the Company for cause. Following July 6, 2015, Dr. Finer will serve as a member of our Scientific Advisory Board.

Under the Agreement, Dr. Finer will continue to receive his salary and benefits and will continue to vest in his outstanding equity awards through July 6, 2015. In the event of a change in control prior to July 6, 2015, all of Dr. Finer's outstanding options will immediately accelerate and become fully exercisable.

Following July 6, 2015, Dr. Finer will continue to receive his base salary for a period of six months and will continue to vest in his outstanding stock options for a period of six months. If he elects to continue his group healthcare benefits, to the extent authorized by and consistent with COBRA, the Company will pay the monthly employer contribution until the earlier of (1) six months following the Separation Date or (2) the date Dr. Finer becomes eligible for insurance through another employer or otherwise becomes ineligible for COBRA.

Dr. David Davidson

The following table describes the potential payments and benefits upon employment termination for David Davidson, the Company's Chief Operating Officer, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and Payment upon Termination Compensation: | Voluntary Resignation | | Voluntary Resignation | | Termination by Company not for Cause | | Termination by Company for Cause | | Termination upon a Sale Event | | Termination by Company without Cause or Voluntary Resignation for Good Reason in Connection with or Following Change in Control |
|---|-----------------------|-------------------|-----------------------|-------------------|--------------------------------------|-----------------|----------------------------------|-----------------|-------------------------------|-----------------|--|
| | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | For Good Reason | |
| Base salary | — | \$ 330,000 | (1) | \$ 330,000 | (1) | — | — | — | — | \$ 330,000 | (3) |
| Cash incentive bonus | — | — | — | — | — | — | — | — | — | \$ 115,500 | (4) |
| Stock options unvested and accelerated | — | — | — | — | — | — | \$ 8,983,994 | (2) | \$ 13,355,244 | (5) | |
| Benefits and Perquisites: | | | | | | | | | | | |
| Health care continuation | — | \$ 21,088 | (6) | \$ 21,088 | (6) | — | — | — | — | \$ 21,088 | (6) |
| Total | \$ — | \$ 351,088 | | \$ 351,088 | | \$ — | \$ 8,983,994 | | \$ 13,821,832 | | |

- (1) Twelve months of 2014 base salary continuation
- (2) Acceleration of 100% of Dr. Davidson's then unvested options granted under the 2010 Stock Option and Grant Plan.
- (3) One times base salary prior to the termination, payable in a lump sum.
- (4) Target bonus for 2014, assuming bonus compensation is fully earned and unpaid.
- (5) Acceleration of 100% of Dr. Davidson's then unvested options
- (6) Payment of the COBRA health and dental insurance premiums for Dr. Davidson and his dependents until the earlier of (a) 12 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

35

Mr. James M. DeTore

The following table describes the potential payments and benefits upon employment termination for James DeTore, the Company's Chief Financial Officer, Treasurer and Principal Financial Officer, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and Payment upon Termination Compensation: | Voluntary | Voluntary | Termination | Termination | Termination | Termination by | | |
|---|-------------|-------------------|-------------------|-------------|-------------|------------------|---------------------|-----|
| | Resignation | Resignation | by Company | By Company | By Company | Company without | Cause or Voluntary | |
| | For Good | For Good | not for Cause | for Cause | for Cause | Event in Control | Resignation for | |
| | Reason | Reason | | | | | Good Reason in | |
| | | | | | | | Upon | |
| | | | | | | | Connection with or | |
| | | | | | | | Following Change | |
| Base salary | — | \$ 320,000 | (1) \$ 320,000 | (1) | — | — | \$ 320,000 | (2) |
| Cash incentive bonus | — | — | — | — | — | — | — | — |
| Stock options unvested and accelerated | — | — | — | — | — | — | \$ 5,223,000 | (3) |
| Benefits and Perquisites: | | | | | | | | |
| Health care continuation | — | \$ 21,088 | (4) \$ 21,088 | (4) | — | — | \$ 21,088 | (4) |
| Total | \$ — | \$ 341,088 | \$ 341,088 | \$ — | \$ — | \$ — | \$ 5,564,088 | |

(1) Twelve months of 2014 base salary continuation

(2) One times base salary prior to the termination, payable in a lump sum.

(3) Acceleration of 100% of Mr. DeTore's then unvested options

(4) Payment of the COBRA health and dental insurance premiums for Mr. DeTore and his dependents until the earlier of (a) 12 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

Mr. Jason F. Cole

The following table describes the potential payments and benefits upon employment termination for Jason F. Cole, the Company's Senior Vice President, General Counsel and Secretary, as if his employment terminated as of December 31, 2014, the last business day of the fiscal year.

| Executive Benefits and | Voluntary | Voluntary | Termination | Termination | Termination by |
|------------------------|-----------|-----------|-------------|-------------|----------------|
|------------------------|-----------|-----------|-------------|-------------|----------------|

| Payment upon Termination | Resignation | Resignation | by Company | By Company | Upon | Company without |
|--|-----------------|-------------------|---------------|-------------------|--------------|--|
| | For Good Reason | For Good Reason | not for Cause | for Cause | a Sale Event | Cause or Voluntary Resignation for Good Reason in Connection with or Following Change in Control |
| Compensation: | | | | | | |
| Base salary | — | \$ 236,250 | (1) | \$ 236,250 | (1) | — \$ 236,250 (2) |
| Cash incentive bonus | — | — | | — | | — |
| Stock options unvested and accelerated | — | — | | — | | — |
| Benefits and Perquisites: | | | | | | |
| Health care continuation | — | \$ 14,321 | (3) | \$ 14,321 | (3) | — \$ 14,321 (3) |
| Total | \$ — | \$ 250,571 | | \$ 250,571 | \$ — | \$ 250,571 |

(1) Nine months of 2014 base salary continuation

(2) None months base salary prior to the termination, payable in a lump sum.

(3) Payment of the COBRA health and dental insurance premiums for Mr. Cole and his dependents until the earlier of (a) 9 months following the date of termination or (b) the end of the named executive officer's COBRA health continuation.

(4) Represents .5 earned, but unused vacation days as of December 31, 2014.

Director Compensation

The following table sets forth a summary of the compensation we paid to our non-employee directors during 2014. Other than as set forth in the table and described more fully below, we did not pay any compensation, reimburse any expense of, make any equity awards or non-equity awards to, or pay any other compensation to any of the other non-employee members of our board of directors in 2014. Mr. Leschly, our president and chief executive officer, receives no compensation for his service as a director, and, consequently, is not included in this table. The compensation received by Mr. Leschly as an employee during 2014 is presented in “Summary Compensation Table” above.

| Name(1) | Fees earned or paid | | Option awards\$(2) | Total(\$) |
|-----------------------------|---------------------|--|--------------------|-----------|
| | in cash(\$) | | | |
| Wendy Dixon, Ph.D. | 47,300 | | 122,972 | 170,272 |
| Steven Gillis, Ph.D. | 47,375 | | 122,972 | 170,347 |
| James Mandell, M.D.. | 46,660 | | 394,800 | 441,460 |
| Daniel S. Lynch | 87,500 | | 172,161 | 259,661 |
| John M. Maraganore, Ph. D | 40,000 | | 122,972 | 162,972 |
| David Schenkein, M.D.. | 42,850 | | 122,972 | 165,822 |
| Robert Tepper, M.D. (3) (4) | — | | 122,972 | 122,972 |
| Mark Vachon | 32,918 | | 367,876 | 400,794 |

- (1) The aggregate number of stock option awards outstanding as of December 31, 2014 for the non-employee members of the board of directors was: Dr. Dixon: 33,861, Dr. Gillis: 7,500, Dr. Mandell: 27,500, Mr. Lynch: 101,842, Dr. Maraganore: 54,046, Dr. Schenkein: 33,861, Dr. Tepper: 7,500 and Mr. Vachon: 20,000.
- (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 2014 as computed in accordance with Accounting Standards Codification, or ASC, Topic 718, not including any estimates of forfeitures. See note 13 of “Notes to Consolidated Financial Statements” in our Annual Report on Form 10-K filed with the SEC on February 25, 2015 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, 2014. 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 named executive officers from the options.
- (3) Ceased serving as a member of the board of directors on March 18, 2015.
- (4) Dr. Tepper voluntarily waived the receipt of cash director compensation.
- Certain of our non-employee directors, including Drs. Dixon, Maraganore and Schenkein, and Mr. Lynch were granted options to purchase shares of our common stock in connection with their appointment to the board of directors prior to our initial public offering. These stock options were all granted at fair market value on the date of grant.

Our board of directors has adopted a non-employee director compensation policy, that is designed to provide a total compensation package that enables us to attract and retain, on a long-term basis, high caliber non-employee directors. Under the policy, all non-employee directors are paid cash compensation from and after the completion of our initial public offering, as set forth below:

| | Annual Retainer |
|---|-----------------|
| Board of Directors: | |
| All non-employee members | \$ 35,000 |
| Additional retainer for Non-Executive Chairman of the Board | \$ 35,000 |
| Audit Committee: | |
| Chairman | \$ 15,000 |
| Non-Chairman members | \$ 7,500 |
| Compensation Committee: | |
| Chairman | \$ 10,000 |
| Non-Chairman members | \$ 5,000 |
| Nominating and Corporate Governance Committee: | |
| Chairman | \$ 7,000 |
| Non-Chairman members | \$ 3,000 |

Under the non-employee director compensation policy, each person who is initially appointed or elected to the board of directors will be eligible for an option grant to purchase up to 20,000 shares of our common stock under our stock option plan on the date he or she first becomes a non-employee director, which will vest annually over a three-year period. The board of directors or compensation committee may exercise its discretion to provide for a different number of options in the event it determines a variation from the stated amount is warranted. In addition, on the date of the annual meeting of stockholders, each continuing non-employee director who has served on the board of directors for a minimum of six months will be eligible to receive an annual option grant to purchase up to 7,500 shares of our common stock, which will vest in full upon the earlier of the first anniversary of the date of grant or the date of the following annual meeting of stockholders. All of the foregoing options will be granted at fair market value on the date of grant.

Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The following table sets forth the amount of common stock of bluebird beneficially owned, directly or indirectly, as of April 13, 2015, by (i) each current director of bluebird, (ii) each named executive officer of bluebird, (iii) all directors and current executive officers of bluebird as a group, and (iv) each person who is known to bluebird to beneficially own more than five percent (5%) of the outstanding shares of common stock of bluebird, as determined through SEC filings, and the percentage of the common stock outstanding represented by each such amount. All shares of common stock shown in the table reflect sole voting and investment power except as otherwise noted.

Beneficial ownership is determined by the rules of the Securities and Exchange Commission and includes voting or investment power of the securities. As of April 13, 2015, bluebird had 32,782,791 shares of common stock outstanding. Shares of common stock subject to options or other rights to purchase which are now exercisable or are exercisable within 60 days after April 13, 2015 are to be considered outstanding for purposes of computing the percentage ownership of the persons holding these options or other rights but are not to be considered outstanding for the purpose of computing the percentage ownership of any other person. Unless otherwise indicated, the address for each person listed below is c/o bluebird bio, Inc., 150 Second Street, Third Floor, Cambridge, Massachusetts 02141.

| Name and Address of Beneficial Owner | Number of Shares Beneficially Owned | Percentage of Shares Beneficially Owned |
|--|--|--|
| 5% Stockholders | | |
| Entities affiliated with FMR LLC (1) | 4,720,878 | 14.4% |
| Capital Research Global Investors (2) | 3,876,111 | 11.8% |
| Directors and Named Executive Officers | | |
| Nick Leschly (3) | 658,886 | 2.0% |
| Wendy L. Dixon, Ph.D. (4) | 25,074 | * |
| Steven Gillis, Ph.D. (5) | 870,921 | 2.7% |
| Daniel S. Lynch (6) | 91,077 | * |
| James Mandell, M.D (7). | 16,935 | * |
| John M. Maraganore, Ph.D. (8) | 53,956 | * |
| David P. Schenkein, M.D. (9) | 26,250 | * |
| Mark Vachon | — | * |
| Jeffrey T. Walsh (10) | 149,722 | * |
| Mitchell Finer, Ph. D. (11) | 111,563 | * |
| David Davidson, M.D. (12) | 108,300 | * |
| James M. DeTore | — | * |
| Jason F. Cole, Esq.(13) | 21,249 | * |
| All executive officers and directors as a group (14 persons)(14) | 2,135,081 | 6.3% |

*Represents holdings of less than 1%

(1) The address for FMR LLC is 245 Summer Street, Boston, Massachusetts 02210. Based solely on a Schedule 13G/A filed with the SEC on February 13, 2015, FMR LLC has sole voting power with respect to 404,682 shares and sole dispositive power with respect to all 4,720,878 shares. Edward C. Johnson 3d, Director and Chairman of FMR LLC, and Abigail P. Johnson, Director, Vice Chairman, Chief Executive Officer and President of FMR LLC, directly or through trusts, are predominant owners of FMR LLC, and each has sole power to dispose of the

4,720,878 shares owned by the funds. Fidelity Growth Company Fund has sole power voting power with respect to 2,162,956 shares and sole dispositive power with respect to 2,162,956 shares. Neither FMR LLC nor Edward C. Johnson 3d nor Abigail P. Johnson has the sole power to vote or direct the voting of the shares owned directly by the Fidelity funds, which power resides with the funds' Boards of Trustees. Fidelity carries out the voting of the shares under written guidelines established by the funds' Boards of Trustees.

- (2) The address for Capital Research Global Investors is 333 S. Hope Street, 55th Floor, Los Angeles, California 90071. Based solely on a Schedule 13G/A filed with the SEC on February 13, 2015, Capital Research Global Investors, a division of Capital Research and Management Company ("CMRC"), beneficially owns and has sole voting and dispositive power of 3,876,111 the shares as a result of CMRC acting as investment advisor to various investment companies registered under Section 8 of the Investment Company Act of 1940.
- (3) Consists of 253,753 shares of common stock and 405,133 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (4) Consists of 25,074 shares of common stock underlying options exercisable within 60 days of April 13, 2015.

39

- (5) Consists of 1,670 shares of common stock and 7,500 shares of common stock underlying options exercisable within 60 days of April 13, 2015 and 861,751 shares of common stock beneficially owned by ARCH Venture Fund VII, L.P. ARCH Venture Fund VII, L.P. is an affiliated fund of ARCH Venture Partners. Dr. Gillis is a managing director with ARCH Venture Partners and owns an interest in ARCH Venture Partners VII, L.P. Dr. Gillis does not have voting or disposition authority over the shares held by ARCH Venture Fund VII, L.P.
- (6) Consists of 91,077 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (7) Consists of 16,935 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (8) Consists of 5,293 shares of common stock and 48,663 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (9) Consists of 1,176 shares of common stock and 25,074 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (10) Consists of 149,722 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (11) Consists of 111,563 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (12) Consists of 108,300 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (13) Consists of 21,249 shares of common stock underlying options exercisable within 60 days of April 13, 2015.
- (14) See footnotes 3-13 above. Consists of 1,123,959 shares of common stock and 1,011,122 shares of common stock underlying options exercisable within 60 days of April 13, 2015. As to disclaimers of beneficial ownership, see footnote 5 above

CERTAIN RELATIONSHIPS AND RELATED PERSON TRANSACTIONS

The following is a description of transactions since January 1, 2014 to which we have been a party, in which the amount involved exceeds \$120,000, and in which any of our directors, executive officers or holders of more than 5% of our capital stock, or an affiliate or immediate family member thereof, had or will have a direct or indirect material interest. We believe the terms obtained or consideration that we paid or received, as applicable, in connection with the transactions described below were comparable to terms available or the amounts that would be paid or received, as applicable, from unaffiliated third parties.

Procedures for related party transactions

We have adopted a related person transaction approval policy that governs the review of related person transactions at bluebird. Pursuant to this policy, if we want to enter into a transaction with a related person or an affiliate of a related person, our General Counsel will review the proposed transaction to determine, based on applicable Nasdaq and Securities and Exchange Commission rules, if such transaction requires pre-approval by the audit committee and/or board of directors. If pre-approval is required, such matters will be reviewed at the next regular or special audit committee and/or board of directors meeting. We may not enter into a related person transaction unless our General Counsel has either specifically confirmed in writing that no further reviews are necessary or has confirmed that all requisite corporate reviews have been obtained.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934 requires bluebird's directors, executive officers and persons who own more than 10% of the bluebird common stock to file with the SEC reports of ownership and changes in ownership of bluebird common stock. Such persons are required by regulations of the SEC to furnish bluebird with copies of all such filings. Based on our review of the reports we have received, bluebird believes that all Section 16(a) filing requirements were complied with during the fiscal year ended December 31, 2014.

AUDIT COMMITTEE REPORT (1)

The Audit Committee has reviewed the Company's audited financial statements for the fiscal year ended December 31, 2014 and has discussed these statements with management and representatives of Ernst & Young 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. Ernst & Young 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 Ernst & Young 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 No. 16 (AS 16) (Communication with Audit Committees), as adopted by the Public Company Accounting Oversight Board, or PCAOB. PCAOB AS No. 16 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.

Ernst & Young 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 Ernst & Young 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 of Directors that the audited financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014, for filing with the Securities and Exchange Commission.

Respectfully submitted by the
Audit Committee,
Mark Vachon, Chairperson

Wendy Dixon

Steven Gillis (through November 13, 2014)

Daniel Lynch

(1) This Section is not “soliciting material,” is not deemed filed with the SEC and is not to be incorporated by reference 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.

42

PROPOSAL 4: RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The firm of Ernst & Young LLP, independent registered public accounting firm, has been selected by the Audit Committee as auditors for bluebird for the fiscal year ending December 31, 2015. Ernst & Young LLP acted as the independent registered public accounting firm for bluebird for the years ended December 31, 2014, 2013 and 2012. A representative of Ernst & Young LLP is expected to be present at the Annual Meeting with the opportunity to make a statement if he desires and to respond to appropriate questions.

The Company's organizational documents do not require that the stockholders ratify the selection of Ernst & Young LLP as the Company's independent registered public accounting firm. bluebird 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 Ernst & Young 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 Ernst & Young 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 bluebird and its stockholders.

The Audit Committee, or a designated member thereof, pre-approves each audit and non-audit service rendered by Ernst & Young LLP to bluebird pursuant to the bluebird Audit and Non-Audit Services Pre-Approval Policy.

Independent Registered Public Accounting Firm Fees

The following is a summary and description of fees incurred by Ernst & Young LLP for the fiscal years ended December 31, 2014 and 2013.

| | Percentage of 2014 | | Percentage of 2013 | |
|------------------------|--------------------|--------------------|--------------------|--------------------|
| | Fiscal Year | Services Approved | Fiscal Year | Services Approved |
| | 2014 | by Audit Committee | 2013 | by Audit Committee |
| Audit fees (1) | \$ 627,000 | 100% | \$ 912,600 | 100% |
| Audit-related fees (2) | \$ 50,000 | 100% | \$ 25,000 | 100% |
| Tax fees (3) | \$ 66,600 | 100% | \$ 44,310 | 100% |
| All other fees (4) | \$ 1,995 | 100% | \$ 1,995 | 100% |
| Total fees | \$ 745,595 | 100% | \$ 983,905 | 100% |

(1) Audit fees in 2014 include fees for our annual audit, including internal control attestation, and quarterly review procedures and fees in connection with our public securities offerings in 2014, including registration statements, comfort letters and consents. Audit fees in 2013 include fees in connection with our initial public offering, including registration statements, responding to SEC comment letters, comfort letters and consents, fees for our annual audit and quarterly review procedures.

(2) Audit-related fees are related to accounting consultations.

(3) Tax fees are related to tax return preparation, tax advisory services and international tax compliance.

(4) All other fees are related to licensing fees paid to Ernst & Young LLP for access to its proprietary accounting research database.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE

FOR

THE RATIFICATION OF THE SELECTION OF ERNST & YOUNG LLP AS THE COMPANY'S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

(PROPOSAL 4 ON YOUR PROXY CARD)

CODE OF BUSINESS CONDUCT AND ETHICS AND CORPORATE GOVERNANCE GUIDELINES

bluebird has adopted a Code of Business Conduct and Ethics for its directors, officers and employees, including its President and Chief Executive Officer, Principal Financial Officer and Controller (or persons performing an equivalent function). A copy of the Company's Code of Business Conduct and Ethics may be accessed free of charge by visiting the Company's website at www.bluebirdbio.com and going to the "Investors & Media—Corporate Governance" section or by requesting a copy in writing from Jason F. Cole, Secretary, at our Cambridge, Massachusetts office. bluebird intends to post on its website any amendment to, or waiver under, a provision of the Code of Business Conduct and Ethics that applies to its President and Chief Executive Officer, Principal Financial Officer or Controller (or persons performing an equivalent function) within four business days following the date of such amendment or waiver.

A copy of the Corporate Governance Guidelines may also be accessed free of charge by visiting the website at www.bluebirdbio.com and going to the "Investors & Media—Corporate Governance" section or by requesting a copy from Jason F. Cole, Secretary, at our Cambridge, Massachusetts office.

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

The Board of Directors 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 bluebird, 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 Audit Committee or the Company's Accounting Compliance Officer, who is the designated contact for these purposes. Contact may be made:

- By e-mail to accountingcomplianceofficer@bluebirdbio.com (anonymity cannot be maintained);
- In writing (which may be done anonymously as set forth under the "Anonymity" section of the Company's Code of Business Conduct and Ethics), addressed to the Accounting Compliance Officer, by U.S. mail to c/o bluebird bio, Inc., 150 Second Street, Third Floor, Cambridge, MA 02141;
- Online at <http://bluebirdbio.silentwhistle.com> (which may be done anonymously as set forth under the "Anonymity" section of the Company's Code of Business Conduct and Ethics); or
- By phoning a voicemail account that we have established for receipt of questions and reports of potential violations of the Code. The voicemail account may be reached at (800) 224-8113 and calls may be made anonymously as set forth under the "Anonymity" section of the Company's Code of Business Conduct and Ethics. 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.

STOCKHOLDER PROPOSALS

Stockholder Recommendations for Director Nominations

Any stockholder wishing to recommend a director candidate for consideration by the nominating and corporate governance committee should provide the following information to the chair of the nominating and corporate governance committee, bluebird bio, Inc., 150 Second Street, Third Floor, Cambridge, MA 02141: (a) a brief statement outlining the reasons the nominee would be an effective director for bluebird; (b) (i) the name, age, and business and residence addresses of the candidate, (ii) the principal occupation or employment of the candidate for the past five years, as well as information about any other Board of Directors and board committees on which the candidate has served during that period, (iii) the number of shares of bluebird stock, if any, beneficially owned by the candidate and (iv) details of any business or other significant relationship the candidate has ever had with bluebird;

and (c) (i) the stockholder's name and record address and the name and address of the beneficial owner of bluebird shares, if any, on whose behalf the proposal is made and (ii) the number of shares of bluebird stock that the stockholder and any such other beneficial owner beneficially own. The Committee may seek further information from or about the stockholder making the recommendation, the candidate, or any such other beneficial owner, including information about all business and other relationships between the candidate and the stockholder and between the candidate and any such other beneficial owner.

Deadlines for Stockholder Proposals and Director Nominations

Stockholders who wish to present proposals for inclusion in our proxy materials for the 2016 Annual Meeting of Stockholders may do so by following the procedures prescribed in Rule 14a-8 under the Securities Exchange Act of 1934 and in our By-laws. Our Secretary must receive stockholder proposals intended to be included in our proxy statement and form of proxy relating to our 2016 Annual Meeting of Stockholders made under Rule 14a-8 by December 29, 2015.

Under our current By-laws, proposals of business and nominations for directors other than those to be included in our proxy materials following the procedures described in Rule 14a-8 may be made by stockholders entitled to vote at the meeting if notice is timely given and if the notice contains the information required by the By-laws. To be timely a notice with respect to the 2016 Annual Meeting of Stockholders must be delivered to our Secretary no earlier than February 4, 2016 and no later than March 5, 2016, unless the date of the 2016 Annual Meeting is advanced or delayed by more than thirty (30) days from the anniversary date of the 2015 Annual Meeting, in which event the By-laws provide different notice requirements.

Any proposal of business or nomination should be mailed to: Jason F. Cole, Secretary, bluebird bio, Inc., 150 Second Street, Third Floor, Cambridge, Massachusetts 02141.

WHERE YOU CAN FIND MORE INFORMATION

bluebird 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 bluebird 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 <http://www.sec.gov>. You may also read and copy any document the Company files with the SEC on our website at <http://www.bluebirdbio.com> under the "Investors and Media" menu.

You should rely on the information contained in this document to vote your shares at the Annual Meeting. bluebird has not authorized anyone to provide you with information that is different from what is contained in this document. This document is dated April 28, 2015. 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 Securities Exchange Act of 1934, as amended, and, in accordance therewith, file reports, proxy statements and other information with the U.S. Securities and Exchange Commission. 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 U.S. Securities and Exchange Commission at 100 F Street, NE, Washington, D.C. 20549, or by way of the U.S. Securities and Exchange Commission's website, <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, as amended, for the fiscal year ended December 31, 2014 as filed with the Securities and Exchange Commission. Requests for such copies should be addressed to:

bluebird bio, Inc.

150 Second Street

Third Floor

Cambridge, Massachusetts 02141

(339) 499-9300

Attention: Jason F. Cole, Secretary

46

IMPORTANT NOTICE REGARDING DELIVERY OF STOCKHOLDER DOCUMENTS

Stockholders of bluebird 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, 2014, unless bluebird 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, 2014, he or she may contact bluebird bio, Inc., 150 Second Street, Third Floor, Cambridge, Massachusetts 02141, (339) 499-9300, Attention: Jason F. Cole, Secretary, and bluebird will deliver those documents to such stockholder promptly upon receiving the request. Any such stockholder may also contact Jason F. Cole, 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 Jason F. Cole, Secretary.

OTHER BUSINESS

The Board of Directors knows of no business to be brought before the 2015 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 2015 Annual Meeting unless they receive instructions from you with respect to such matter.

Signature [PLEASE SIGN WITHIN BOX] Date Signature (Joint Owners) Date KEEP THIS PORTION FOR YOUR RECORDS DETACH AND RETURN THIS PORTION ONLY TO VOTE, MARK BLOCKS BELOW IN BLUE OR BLACK INK AS FOLLOWS: THIS PROXY CARD IS VALID ONLY WHEN SIGNED AND DATED.

BLUEBIRD BIO, INC. M91449-P62648 !!! 01) Daniel S. Lynch 02) John M. Maraganore 1. Election of Directors 2. Advisory vote on executive compensation. 3. Advisory vote on the frequency of advisory votes on executive compensation. 4. To ratify the appointment of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2015. NOTE: Such other business as may properly come before the meeting or any adjournment thereof. Please sign exactly as your name(s) appear(s) hereon. When signing as attorney, executor, administrator, or other fiduciary, please give full title as such. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by authorized officer. Nominees: The Board of Directors recommends you vote FOR the following: The Board of Directors recommends you vote FOR the following proposal: The Board of Directors recommends you vote FOR the following proposal: The Board of Directors recommends you vote 3 YEARS on the following proposal: ! ! ! ! For All Withhold All For All Except For Against To withhold authority to vote for any individual nominee(s), mark "For All Except" and write the number(s) of the nominee(s) on the line below. BLUEBIRD BIO, INC. 150 SECOND STREET CAMBRIDGE, MA 02141 VOTE BY INTERNET - www.proxyvote.com Use the Internet to transmit your voting instructions and for electronic delivery of information up until 11:59 P.M. Eastern Time the day before the cut-off date or meeting date. Have your proxy card in hand when you access the web site and follow the instructions to obtain your records and to create an electronic voting instruction form. Electronic Delivery of Future PROXY MATERIALS If you would like to reduce the costs incurred by our company in mailing proxy materials, you can consent to receiving all future proxy statements, proxy cards and annual reports electronically via e-mail or the Internet. To sign up for electronic delivery, please follow the instructions above to vote using the Internet and, when prompted, indicate that you agree to receive or access proxy materials electronically in future years. VOTE BY PHONE - 1-800-690-6903 Use any touch-tone telephone to transmit your voting instructions up until 11:59 P.M. Eastern Time the day before the cut-off date or meeting date. Have your proxy card in hand when you call and then follow the instructions. VOTE BY MAIL Mark, sign and date your proxy card and return it in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717. 3 Years 2 Years 1 Year Abstain ! ! ! ! For Against Abstain

M91450-P62648 Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting: The Notice and Proxy Statement and Form 10-K are available at www.proxyvote.com. BLUEBIRD BIO, INC. Annual Meeting of Stockholders June 4, 2015, 8:30 AM EDT This proxy is solicited by the Board of Directors The undersigned stockholder of bluebird bio, Inc., a Delaware corporation (the "Company"), hereby acknowledges receipt of the Notice of 2015 Annual Meeting of Stockholders and Proxy Statement, each dated April 24, 2015, and hereby appoints James DeTore and Jason Cole, and each of them, proxies and attorneys-in-fact, with full power of substitution to each, on behalf and in the name of the undersigned, to represent the undersigned at the 2015 Annual Meeting of Stockholders of the Company to be held at the offices of bluebird bio, Inc., located at 150 Second Street, Third floor, Cambridge, Massachusetts on June 4, 2015, at 8:30 AM EDT, and at any adjournments or postponements thereof, and to vote all shares of Common Stock which the undersigned would be entitled to vote if then and there personally present, on the matters set forth on the reverse side. THE SHARES REPRESENTED BY THIS PROXY WILL BE VOTED AS DIRECTED OR, IF NO DIRECTION IS GIVEN, WILL BE VOTED "FOR" THE NOMINEES LISTED IN PROPOSAL NO. 1, "FOR" PROPOSAL NO. 2, FOR "3 YEARS" FOR PROPOSAL NO. 3 AND "FOR" PROPOSAL NO. 4. THE SHARES REPRESENTED BY THIS PROXY WILL BE VOTED IN THE DISCRETION OF THE PROXY HOLDER ON ANY MATTER INCIDENTAL TO THE FOREGOING OR ON ANY OTHER MATTERS THAT MAY PROPERLY COME BEFORE THE ANNUAL MEETING OR ANY ADJOURNMENT OR POSTPONEMENTS THEREOF. Continued and to be signed on reverse side