

GENOCEA BIOSCIENCES, INC.
Form DEF 14A
April 21, 2016

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
SCHEDULE 14A
Proxy Statement Pursuant to Section 14(a) of
the Securities Exchange Act of 1934
Filed by the Registrant

Filed by a Party other than the Registrant
Check the appropriate box:

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

Genocea Biosciences, 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.
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 - (2) Aggregate number of securities to which transaction applies:
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- (3) Filing Party:
- (4) Date Filed:

Genocea Biosciences, Inc.
100 Acorn Park Drive,
Cambridge, MA 02140

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

The 2016 Annual Meeting of Stockholders of Genocea Biosciences, Inc. (the "Company" or "Genocea") will be held on June 7, 2016, at 9:00 a.m. local time, at Ropes & Gray LLP, Prudential Tower, 800 Boylston Street, Boston, MA 02199 (the "Annual Meeting") for the following purposes:

1. To elect Ms. Katrine Bosley, Mr. Michael Higgins, and Dr. Stephen Hoffman as Class II directors, each for a three-year term;
2. To ratify the appointment of Ernst & Young LLP as the independent registered public accounting firm for the Company for the fiscal year ending December 31, 2016; and
3. To consider and act upon any other matters that properly come before the Annual Meeting or any adjournment or postponement thereof.

Each outstanding share of the Company's common stock (NASDAQ: GNCA) entitles the holder of record at the close of business on April 15, 2016, to receive notice of and to vote at the Annual Meeting or any adjournment or postponement of the Annual Meeting.

WHETHER OR NOT YOU EXPECT TO ATTEND THE ANNUAL MEETING, WE URGE YOU TO VOTE YOUR SHARES BY FOLLOWING THE INSTRUCTIONS TO THE IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS THAT YOU PREVIOUSLY RECEIVED AND SUBMIT YOUR PROXY BY INTERNET, TELEPHONE, OR BY SIGNING, DATING AND RETURNING THE PROXY CARD INCLUDED IN THESE MATERIALS. IF YOU CHOOSE TO ATTEND THE ANNUAL MEETING, YOU MAY STILL VOTE YOUR SHARES IN PERSON, EVEN THOUGH YOU HAVE PREVIOUSLY VOTED OR RETURNED YOUR PROXY BY ANY OF THE METHODS DESCRIBED IN OUR PROXY STATEMENT. IF YOUR SHARES ARE HELD IN A BANK OR BROKERAGE ACCOUNT, PLEASE REFER TO THE MATERIALS PROVIDED BY YOUR BANK OR BROKER FOR VOTING INSTRUCTIONS.

ALL STOCKHOLDERS ARE EXTENDED A CORDIAL INVITATION TO ATTEND THE ANNUAL MEETING.

By Order of the Board of Directors

William Clark
President and Chief Executive Officer
April 21, 2016

Genocea Biosciences, Inc.

PROXY STATEMENT FOR ANNUAL MEETING OF STOCKHOLDERS

To Be Held On Tuesday, June 7, 2016 at 9:00 am EDT

This proxy statement (the "Proxy Statement"), along with the accompanying Notice of 2016 Annual Meeting of Stockholders, contains information about the Annual Meeting, including any adjournments or postponements of the Annual Meeting. We are holding the Annual Meeting at 9:00 a.m. local time, at Ropes & Gray LLP, Prudential Tower, 800 Boylston Street, Boston, MA 02199.

On or about April 21, 2016, we made available this Proxy Statement and the attached Notice of 2016 Annual Meeting of Stockholders to all stockholders entitled to vote at the Annual Meeting, and we began sending the proxy card and the Important Notice Regarding the Availability of Proxy Materials to all stockholders entitled to vote at the Annual Meeting. Although not part of this Proxy Statement, we have also made available with this Proxy Statement our Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (the "Annual Report"), which includes our financial statements for the fiscal year ended December 31, 2015.

IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS FOR THE STOCKHOLDER MEETING TO BE HELD ON JUNE 7, 2016

This Proxy Statement and our Annual Report are available for viewing, printing and downloading at www.proxyvote.com. To view these materials, please have your 16-digit control number(s) available that appears on your proxy card.

Additionally, you can find a copy of our Annual Report on the website of the Securities and Exchange Commission ("SEC") at www.sec.gov, or in the "Annual Report and Proxies" tab of the "Investors Relations" section of our website at www.genocea.com. You may also obtain a printed copy of our Annual Report, free of charge, by sending a written request to: Genocea Biosciences, Inc., 100 Acorn Park Drive, Cambridge, Massachusetts 02140, Attention: Secretary. Exhibits, if any, will be provided upon written request and payment of an appropriate processing fee.

GENERAL INFORMATION

When are this Proxy Statement and the accompanying material scheduled to be sent to stockholders?

On or about April 21, 2016, we began sending the Important Notice Regarding the Availability of Proxy Materials to all stockholders entitled to vote at the Annual Meeting.

Who is soliciting my vote?

The Board of Directors of the Company is soliciting your vote for the 2016 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 15, 2016.

How many votes can be cast by all stockholders?

A total of 28,261,921 shares of common stock of the Company were outstanding on April 15, 2016 and are entitled to be voted at the Annual Meeting. Each share of common stock is entitled to one vote on each matter.

How do I vote?

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

By Internet. Access the website at www.proxyvote.com and follow the instructions provided on the Important Notice Regarding Availability of Proxy Materials on the proxy card. Your shares will be voted in accordance with your

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instructions. You must specify how you want your shares voted, or your Internet vote cannot be completed and you will receive an error message.

By Telephone. Call 1-800-690-6903 toll-free 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 the enclosed proxy card to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY, 11717 in the enclosed postage prepaid envelope. 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 (i) FOR the election as directors of the nominees named herein to the Company's Board of Directors, and (ii) FOR the ratification of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2016 and (iii) will be voted according to the discretion of the proxy holder named in the proxy card upon any other business that may properly be brought before the Annual Meeting and at all adjournments and postponements thereof.

In Person at the Annual Meeting. If you attend the Annual 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 Annual 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 Annual Meeting. If you attend the Annual 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 Annual Meeting.

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

The Board of Directors recommends a vote:

Proposal 1: FOR ALL - election of the three Class II directors

Proposal 2: FOR ratification of the appointment of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year 2016

Who pays the cost for soliciting proxies?

Genocea will bear the cost of solicitation of proxies. This includes the charges and expenses of brokerage firms and others for forwarding solicitation material to beneficial owners of our outstanding common stock. Genocea may solicit proxies by mail, personal interview, telephone, or via the Internet through its officers, directors and other management employees, who will receive no additional compensation for their services.

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 Annual 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.

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. Abstentions and "broker non-

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votes" (i.e., shares represented at the Annual 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, such brokers or nominees do not have discretionary voting power to vote such shares), if any, will be counted for purposes of determining whether a quorum is present for the transaction of business at the Annual Meeting.

What vote is required to approve each item?

Directors are elected by a plurality of votes cast (Proposal 1). A vote to withhold or a broker non-vote will have no direct effect on the outcome. 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, 2016 (Proposal 2). A vote to abstain will have no direct effect on the outcome.

If there are insufficient votes to approve these proposals, your proxy may be voted by the persons named in the proxy card to adjourn the Annual Meeting in order to solicit additional proxies in favor of the approval of such proposals. If the Annual Meeting is adjourned or postponed for any purpose, at any subsequent reconvening of the Annual 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.

Could other matters be decided at the Annual Meeting?

Genoceca does not know of any other matters that may be presented for action at the Annual Meeting. Should any other business come before the Annual 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 Annual Meeting is postponed or adjourned?

Your proxy may be voted at the postponed or adjourned Annual Meeting. You will still be able to change your proxy until it is voted.

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 Jonathan Poole, Secretary, at 617-876-8191. 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 NO. 1—ELECTION OF DIRECTORS

In accordance with the Company's amended and restated certificate of incorporation and amended and restated 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. Katrine Bosley, Michael Higgins and Stephen Hoffman, M.D., Ph.D. are the Class II directors whose terms expire at the Annual Meeting. Each of Ms. Bosley, Mr. Higgins and Dr. Hoffman 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 2019 annual meeting of stockholders and until his or her successor is duly elected.

It is intended that, unless you give contrary instructions, shares represented by proxies will be voted for the election of the three nominees listed above as director nominees. Genoclea has no reason to believe that any nominee will be unable to serve. 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 Genoclea, principal occupation and other biographical material is shown below.

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

DIRECTOR BIOGRAPHIES

Below sets forth information concerning our directors as of March 31, 2016. 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

Katrine Bosley, age 48, is a Class II director who has served as a member of our Board of Directors since March 2013 and as our chair since August 2013. Ms. Bosley is the Chief Executive Officer of Editas Medicine Inc. ("Editas"), a position to which she was appointed in June 2014. Prior to Editas, Ms. Bosley was the Entrepreneur-in-Residence at The Broad Institute from September 2013 to May 2014. She served as Chief Executive Officer of Avila Therapeutics Inc. ("Avila"), from May 2009 to March, 2012, when Avila was acquired by Celgene Corporation. Before Avila, she was Vice President, Strategic Operations at Adnexus Therapeutics Inc. ("Adnexus"), a Bristol-Myers Squibb Company and was Vice President, Business Development at Adnexus before that. She joined Adnexus from Biogen Idec where she held roles in business development, commercial operations, and portfolio strategy in the United States and Europe and led the in-licensing of Tysabri (natalizumab) among a number of other transactions. Earlier, she was part of the healthcare team at the venture firm Highland Capital Partners from 1993 to 1995. In addition to serving as a director of our Company, Ms. Bosley currently serves as a director of Galapagos NV and Scholar Rock LLC. She also is a member of the BIO Governing Board for Emerging Companies. Ms. Bosley graduated from Cornell University with a B.A. in Biology. We believe that Ms. Bosley's experience as a chief executive officer of a biotechnology company and her breadth of experience in creating strategic and business development value qualifies her to serve as a member of our Board of Directors.

Michael Higgins, age 53, is a Class II director who has served as a member of our Board of Directors since February 2015. In January 2015, Mr. Higgins joined Polaris Venture Partners as an Entrepreneur-in-Residence. Prior to joining

Polaris Venture Partners, Mr. Higgins served as Chief Operating Officer and Chief Financial Officer at Ironwood Pharmaceuticals ("Ironwood") from 2003 through 2014, playing a key role in Ironwood's evolution from a privately-funded discovery organization through its initial public offering and the launch of its first commercial product. Under his leadership, the company was able to raise more than one billion dollars to help support the development of the business during that period. Prior to his work at Ironwood, from 1997 through 2003, Mr. Higgins worked at Genzyme Corporation ("Genzyme") in a variety of leadership roles including Vice President, Corporate Finance and Vice President, Business Development. While at Genzyme, he was involved with multiple businesses including the Cell Therapy, Gene Therapy, and Orphan Disease business units. Previously, Mr. Higgins served as Chief Financial Officer of Procept, Inc., from 1992 to 1997 and led the company through its initial public offering. Mr. Higgins currently serves as a director of Pulmatrix, Inc. and Voyager Therapeutics. Mr. Higgins began his pharmaceutical career as a sales representative for Schering-Plough Corporation in 1986. Mr. Higgins earned his B.S. from Cornell University and holds a M.B.A. from the Amos Tuck School of Business at Dartmouth College. We believe that Mr. Higgin's financial and business expertise, including his diversified background as an executive officer in public pharmaceutical companies, qualifies him to serve as a member of our Board of Directors.

Stephen Hoffman, M.D., Ph.D., age 62, is a Class II director who has served as a member of our Board of Directors since December 2010. Dr. Hoffman has been a Senior Advisor to PDL BioPharma, Inc. since February 2014. Prior to that, Dr. Hoffman served as a managing director at Skyline Ventures, a venture capital firm, from May 2007 to February 2014. From January 2003 to March 2007, Dr. Hoffman was a general partner at TVM Capital, a venture capital firm. Prior to that, he served as President, Chief Executive Officer and a director of Allos Therapeutics, Inc. ("Allos"), a biopharmaceutical company, from 1994 to 2002, and as Chairman of the Board until 2012. From 1990 to 1994, Dr. Hoffman completed a fellowship in clinical oncology and a residency/fellowship in dermatology, both at the University of Colorado. Dr. Hoffman was the scientific founder of Somatogen Inc., a biotechnology company that was acquired by Baxter International, Inc., a global medical products and services company, in 1998, where he held the position of Vice President of Science and Technology from 1987 until 1990. In addition to serving as a director of our Company, he currently serves as a director of several biopharmaceutical companies, including AcelRx, Inc., Concert Pharmaceuticals, Inc., Collegium Pharmaceuticals, Inc., Dicerna Pharmaceuticals, Inc. and Proteon Therapeutics, Inc. Previously, Dr. Hoffman served on the Board of Directors of Sirtris Pharmaceuticals, Inc., a pharmaceutical company that was acquired by GlaxoSmithKline, in 2008. Dr. Hoffman holds a Ph.D. in bio-organic chemistry from Northwestern University and an M.D. from the University of Colorado School of Medicine. We believe that Dr. Hoffman's scientific, financial and business expertise, including his diversified background as an executive officer and investor in public pharmaceutical companies as well as a director of a public pharmaceutical company, qualifies him to serve as a member of our Board of Directors.

DIRECTORS NOT STANDING FOR ELECTION AT THE ANNUAL MEETING

William Clark, age 47, is a Class III director who has served on our Board of Directors and as our President and Chief Executive Officer since February 2011. Previously he served as our Chief Business Officer from August 2010 to February 2011. Mr. Clark has served on our Board of Directors since February 2011. Prior to joining our Company, he served as Chief Business Officer at Vanda Pharmaceuticals, Inc. ("Vanda"), a biopharmaceutical company he co-founded in 2004. While at Vanda, he led the company's strategic and business development activities, and played a central role in raising more than \$220 million in multiple public and private financings. Prior to Vanda, Mr. Clark was a principal at Care Capital, LLC, a venture capital firm investing in biopharmaceutical companies, after serving in a variety of commercial and strategic roles at SmithKline Beecham (now GlaxoSmithKline). Mr. Clark holds a B.A. from Harvard University and an M.B.A. from The Wharton School at the University of Pennsylvania. We believe that Mr. Clark's operational and historical experience with our Company gained from serving as our Chief Executive Officer, President and member of our Board of Directors, combined with his prior experience at Vanda and in the venture capital industry focusing on biopharmaceutical companies qualify him to serve as a member of our Board of Directors.

Kenneth Bate, age 65, is a Class I director who has served as a member of our Board of Directors since September 2014. Mr. Bate is currently a director of AVEO Pharmaceuticals, Catabasis Pharmaceuticals, Epizyme Inc. and Vanda Pharmaceuticals. Mr. Bate previously served as President and Chief Executive Officer of Archemix Corp. and NitroMed Inc., Chief Financial Officer of Millennium Pharmaceuticals Inc. and Biogen Inc., and co-founded JSB Partners LLC, a banking and advisory services firm for biopharmaceutical and life sciences companies. He holds a M.B.A. from the Wharton School of the University of Pennsylvania and a B.A. from Williams College. We believe that Mr. Bate's experience as a chief executive officer of multiple biotechnology companies, as well as his experience as a director of other companies, qualifies him to serve as a member of our Board of Directors.

Kevin Bitterman, Ph.D., age 39, is a Class I director who has served as a member of our Board of Directors since August 2006. Dr. Bitterman serves as a partner at Polaris Partners ("Polaris"), where he has been employed since 2004 and where he focuses on investments in life sciences companies. Prior to joining Polaris, Dr. Bitterman completed his Ph.D. in Genetics at Harvard Medical School. Dr. Bitterman was the founding CEO at Visterra Inc., Editas Medicine

Inc. and Morphic Rock Therapeutic Inc. In addition to representing Polaris as a director of our Company, he currently represents Polaris as a director of Editas Medicine Inc., InSeal Medical, Kala Pharmaceuticals, Morphic Rock Therapeutic Inc. Neuronetics, Inc., Visterra, Inc., TARIS Biomedical, and Vets First Choice. He received a Ph.D. in Genetics from Harvard Medical School and a B.S. in Biology from Rutgers College. We believe that Dr. Bitterman's extensive experience investing in, guiding and leading start-up and early phase companies, as well as his experience as a director of other companies, qualifies him to serve as a member of our Board of Directors.

George Siber, M.D., age 71, is a Class III director who has served as a member of our Board of Directors since 2007. From 1996 to 2007, Dr. Siber served as Executive Vice President and Chief Scientific Officer of Wyeth Vaccines ("Wyeth"). While at Wyeth, Dr. Siber oversaw the development and approval of multiple widely-used childhood vaccines, including Prevnar, a pneumococcal vaccine which has achieved multibillion dollar revenues; Acel-Imune, an acellular pertussis vaccine; and Meningitec, a meningococcal meningitis vaccine. Prior to Wyeth, Dr. Siber was Director of the Massachusetts Public Health

Biologic Laboratories and a Harvard Medical School Associate Professor of Medicine at Dana Farber Cancer Institute. During this time, Dr. Siber led the research and manufacturing of multiple vaccines and immune globulins including Respigam, a human immune globulin against respiratory syncytial virus. Since 2007, Dr. Siber has served on the boards of directors of several vaccine companies, including Crucell, Selecta Biosciences, Vedantra Pharmaceuticals and Affinivax Inc., and as a consultant or scientific advisory board member of ClearPath Vaccines Company, of which he is currently the Chief Scientific Officer, PaxVax, Vaxess Technologies, Inc., the Bill & Melinda Gates Foundation, PATH, the Wellcome Trust, the European Commission (on vaccinations), the National Institutes of Health, or NIH, and the Korean FDA. Dr. Siber serves as a member of the Board of Trustees of the International Vaccine Institute. Dr. Siber holds an M.D. degree from McGill University in Canada, received post-doctoral training in Internal Medicine at Rush-Presbyterian Hospital in Chicago and Beth Israel Hospital in Boston and Infectious Disease and vaccinology training at Children's Hospital and Beth Israel Hospital, Harvard Medical School Boston. We believe that Dr. Siber's experience in life sciences and vaccine industries and his experience overseeing the development of multiple vaccines qualifies him to serve as a member of our Board of Directors.

BOARD OF DIRECTORS AND ITS COMMITTEES

The following table describes which directors serve on each of the committees of the Board of Directors.

| Name | Nominating and Corporate Governance Committee | Compensation Committee | Audit Committee | |
|------------------------------|---|------------------------|-----------------|-----|
| Kenneth Bate | | X | (1)X | |
| Kevin Bitterman, Ph.D. | X | X | | |
| Katrine Bosley | X | (1) | X | |
| William Clark | | | | |
| Michael Higgins | | | X | (1) |
| Stephen Hoffman, M.D., Ph.D. | X | X | | |
| George Siber, M.D. | | | | |

(1) Chair of the committee.

THE BOARD OF DIRECTORS AND ITS COMMITTEES

Director Independence

As required by the listing standards of The NASDAQ Global Market ("NASDAQ"), the Board of Directors has affirmatively determined, upon the recommendation of the Nominating and Corporate Governance Committee, that each of our directors and nominees for director, other than George Siber, M.D. as a result of his consulting relationship with us, and William Clark, our President and Chief Executive Officer, is independent. To make this determination, our Board of Directors reviews all relevant transactions or relationships between each director and Genoclea, its senior management and its independent registered public accounting firm. During this review, the Board of Directors considers whether there are any transactions or relationships between directors or any member of their immediate family (or any entity of which a director or an immediate family member is an executive officer, general partner or significant equity holder) and members of our senior management or their affiliates. The Board of Directors consults with Genoclea's outside corporate counsel to ensure that the Board of Directors' determinations are consistent with all relevant securities and other laws and regulations regarding the definition of "independent," including those set forth in pertinent NASDAQ listing standards, as in effect from time to time.

Board Meetings and Attendance

The Board of Directors held ten meetings during the year ended December 31, 2015. Each of the directors, other than George Siber, 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 year ended December 31, 2015 (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). Each director who is up for election at an annual meeting of stockholders or who has a term that continues after such annual meeting is expected to attend the Annual Meeting. All of our then seven directors on the Board of Directors attended our 2015 annual meeting.

Board Committees

The Board of Directors has standing Audit, Compensation and Nominating and Corporate Governance Committees, 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 Committees operate pursuant to a written charter and each committee reviews and assesses the adequacy of its charter. The charters for the Audit, Compensation and Nominating and Corporate Governance Committees are all available on our website (<http://ir.genoclea.com/>) under "Investor Relations" at "Corporate Governance."

Audit Committee

Our Audit Committee is composed of Mr. Bate, Ms. Bosley, and Mr. Higgins, with Mr. Higgins serving as chair of the committee. Our Board of Directors has determined, upon the recommendation of the Nominating and Corporate Governance Committee, that each member of the Audit Committee meets the independence requirements of Rule 10A-3 under the Exchange Act of 1934, as amended (the "Exchange Act") and the applicable listing standards of NASDAQ. Our Board of Directors has determined that each of Mr. Bate, Ms. Bosley, and Mr. Higgins is an "audit committee financial expert" within the meaning of the SEC regulations and applicable listing standards of NASDAQ.

The Audit Committee's responsibilities include:

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

pre-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 internal 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;

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- 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 Company's independent registered public accounting firm, whether our audited financial statements shall be included in our Annual Report;
- monitoring 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 SEC to be included in our annual proxy statement;
- viewing all related party transactions for potential conflict of interest situations and approving all such transactions; and
- reviewing and discussing with management and our independent registered public accounting firm our earnings releases and scripts.

All audit and non-audit services to be provided to us by our independent registered public accounting firm must be approved in advance by the Audit Committee. During the year ended December 31, 2015, the Audit Committee met six times. The report of the Audit Committee is included in this Proxy Statement under "Audit Committee Report."

Compensation Committee

Our Compensation Committee is composed of Mr. Bate, Dr. Bitterman and Dr. Hoffman, with Mr. Bate serving as chair of the committee. The Board of Directors has determined, upon the recommendation of the Nominating and Corporate Governance Committee, that each member of the Compensation Committee is "independent" within the meaning of the rules and regulations of NASDAQ and the SEC. In addition, each member qualifies as an "outside director" within the meaning of Section 162(m) of the Internal Revenue Code and is a "non-employee director" within the meaning of the rules of the SEC.

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 and approving 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;
- overseeing and administering our equity compensation and other compensatory plans;
 - reviewing and approving our equity and incentive policies and procedures for the grant of equity-based awards and approving the grant of such equity-based awards;
- reviewing and making recommendations to the Board of Directors with respect to director compensation; and
- reviewing and discussing with management the compensation discussion and analysis to be included in our annual proxy statement or Annual Report.

During the year ended December 31, 2015, the Compensation Committee met four times.

Nominating and Corporate Governance Committee

Our Nominating and Corporate Governance Committee is composed of Dr. Bitterman, Ms. Bosley and Dr. Hoffman, with Ms. Bosley serving as chair of the committee. Our Board of Directors has determined that each member of the Nominating and Corporate Governance Committee is "independent" within the meaning of the rules and regulations of NASDAQ.

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 of Directors' committees;
- developing and recommending to the Board of Directors a set of corporate governance principles;
- articulating to each director what is expected, including reference to the corporate governance principles and directors' duties and responsibilities;
- reviewing and recommending to the Board of Directors practices and policies with respect to directors;
- reviewing and recommending to the Board of Directors the functions, duties and compositions of the committees of the Board of Directors;
- reviewing and assessing the adequacy of the committee charter and submitting any changes to the Board of Directors for approval;
- consider and report to the Board of Directors any questions of possible conflicts of interest of Board of Directors members;
- provide for new director orientation and continuing education for existing directors on a periodic basis;
- performing an evaluation of the performance of the committee; and
- overseeing the evaluation of the Board of Directors and management.

The Nominating and Corporate Governance Committee does not set specific, minimum qualifications that nominees must meet in order to be recommended to the Board of Directors, but rather believes that each nominee should be evaluated based on his or her individual merits, taking into account the needs of Genoclea and the composition of the Board of Directors. Additionally, neither the Nominating and Corporate Governance Committee nor the Board of Directors has a specific policy with regard to the consideration of diversity in identifying director nominees; however, both may consider the diversity of background and experience of a director nominee in the context of the overall composition of the Board of Directors at that time, such as diversity of knowledge, skills, experience, geographic location, age, gender, and ethnicity. Members of the Nominating and Corporate Governance Committee discuss and evaluate possible candidates in detail and suggest individuals to explore in more depth.

The Nominating and Corporate Governance Committee will consider candidates recommended by stockholders. Candidates recommended by stockholders are given appropriate consideration in the same manner as other candidates.

During the year ended December 31, 2015, the Nominating and Corporate Governance Committee met two times.

Board of Directors Leadership Structure

Ms. Bosley has served as the chair of our Board of Directors since August 2013. The independent members of the Board of Directors have periodically reviewed the Board of Directors' leadership structure and have determined that

Genocea and our stockholders are well served with this structure.

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The chair of the Board of Directors provides leadership to the Board of Directors and works with the Board of Directors to define its activities and the calendar for fulfillment of its responsibilities. The chair of the Board of Directors approves the meeting agendas after input from the Board of Directors and management, facilitates communication among directors and presides at meetings of our Board of Directors and stockholders.

The Board of Directors' Role in Risk Oversight

The Board of Directors plays an important role in risk oversight through direct decision-making authority with respect to significant matters as well as through the oversight of management by the Board of Directors and its committees. In particular, the Board of Directors administers its risk oversight function through (1) the review and discussion of regular periodic reports by the Board of Directors and its committees on topics relating to the risks that we face, (2) the required approval by the Board of Directors (or a committee of the Board of Directors) of significant transactions and other decisions, (3) the direct oversight of specific areas of our business by the Audit, Compensation and Nominating and Corporate Governance Committees, and (4) regular periodic reports from the auditors and other outside consultants regarding various areas of potential risk, including, among others, those relating to the our internal control over financial reporting. The Board of Directors also relies on management to bring significant matters impacting our Company to the attention of the Board of Directors.

Pursuant to the Audit Committee's charter, the Audit Committee is responsible for reviewing and discussing with management and the independent registered public accounting firm our system of internal controls, our critical accounting practices, and policies relating to risk assessment and management. As part of this process, the Audit Committee discusses our major financial risk exposures and steps that management has taken to monitor and control such exposure. In addition, the Audit Committee has established procedures for the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters, and the confidential, anonymous submissions by employees of concerns regarding questionable accounting or accounting matters.

Because of the role of the Board of Directors and the Audit Committee in risk oversight, the Board of Directors believes that any leadership structure that it adopts must allow it to effectively oversee the management of the risks relating to our operations. The Board of Directors acknowledges that there are different leadership structures that could allow it to effectively oversee the management of the risks relating to the Company's operations and believes its current leadership structure enables it to effectively provide oversight with respect to such risks.

Compensation Consultant

As a part of determining compensation for our named executive officers, the Compensation Committee engaged Radford, an Aon Hewitt Company - a division of Aon Corporation ("Radford"), as its independent compensation consultant in 2015. As its independent compensation consultant, Radford provided analysis and recommendations to the Compensation Committee regarding:

- trends with respect to executive compensation;
- selection of a peer group used for compensation-related purposes;
- compensation practices for our peer group;
- compensation programs for executives, directors, and employees generally; and
- stock utilization and related metrics.

When requested, consultants from Radford attended meetings of the Compensation Committee, including executive sessions in which executive compensation issues were discussed. Radford reported to the Compensation Committee and not to management, although Radford met with management for purposes of gathering information for its

analyses and recommendations.

Although the Board of Directors and the Compensation Committee considered the advice and recommendations of this independent compensation consultant (and any other compensation consultant it might engage in the future) as such advice and recommendations relate to our executive compensation program, the Board of Directors and the Compensation Committee ultimately make their own decisions about the compensation arrangements for our executive officers.

In determining whether to engage Radford, the Compensation Committee considered the independence of Radford, taking into consideration relevant factors, including the absence of other services provided to the Company by Radford, the amount of fees the Company paid to Radford as a percentage of Radford's total revenues, the policies and procedures of Radford that are designed to prevent conflicts of interest, any business or personal relationship of the individual compensation advisors employed by Radford with any executive officer of the Company, any business or personal relationship of the individual

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compensation advisors employed by Radford with any member of the Compensation Committee, and any stock of the Company owned by Radford or the individual compensation advisors employed by Radford (the “Independence Factors”). The Compensation Committee has determined, based on its analysis in light of all relevant factors, including the Independence Factors listed above, that the work of Radford and the individual compensation advisors employed by Radford as compensation consultants to the Compensation Committee create any conflicts of interest, and that Radford was independent pursuant to the independence standards set forth in the NASDAQ listing standards promulgated pursuant to Section 10C of the Exchange Act.

In September 2015, the Compensation Committee engaged Pay Governance LLC (“Pay Governance”) as its independent compensation consultant to perform board, executive and non-executive compensation-related services. As part of its review of the competitiveness of our executive compensation program, our Compensation Committee also asked Pay Governance to review target bonus amounts for our non-executive employees. Our Compensation Committee approved the engagement. Following its appointment in September 2015, Pay Governance assisted and, in 2016 has continued to assist, the Compensation Committee with compensation-related matters. In determining whether to engage Pay Governance, the Compensation Committee considered independence factors similar to those factors considered in engaging Radford. The Compensation Committee has determined, based on its analysis in light of all relevant factors, that the work of Pay Governance and the individual compensation advisors employed by Pay Governance as compensation consultants to the Compensation Committee has not created any conflicts of interest, and that Pay Governance is independent pursuant to the independence standards set forth in the NASDAQ listing standards promulgated pursuant to Section 10C of the Exchange Act.

Compensation Committee Interlocks and Insider Participation

None of our executive officers serves as a member of the Board of Directors or Compensation Committee, or other committee serving an equivalent function, of any other entity that has one or more of its executive officers serving as a member of our Board of Directors or Compensation Committee. Our Compensation Committee is composed of Mr. Bate, Dr. Bitterman and Dr. Hoffman, with Mr. Bate serving as chair of the committee. None of the members of our Compensation Committee has ever been employed by us.

Non-Employee Director Compensation Policy

Our Board of Directors adopted a non-employee director compensation policy that is designed to enable us to attract and retain, on a long-term basis, highly qualified non-employee directors. Under the policy, as may be amended from time to time, all non-employee directors will be paid cash compensation as set forth in the following table:

| | Annual Retainer |
|--|-----------------|
| Board of Directors: | |
| All non-employee members | \$ 35,000 |
| Additional retainer for chair (1) | \$ 40,000 |
| Audit Committee: | |
| Members | \$ 7,500 |
| Additional retainer for chair | \$ 7,500 |
| Compensation Committee: | |
| Members | \$ 5,000 |
| Additional retainer for chair | \$ 5,000 |
| Nominating and Corporate Governance Committee: | |
| Members | \$ 3,500 |
| Additional retainer for chair | \$ 3,500 |

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- (1) Effective January 1, 2016, the non-employee director compensation policy was amended to increase the annual additional retainer for the non-employee chair of the Board of Directors from \$25,000 to \$40,000. Our Compensation Committee recommended, and our Board of Directors approved, this increase after reviewing market data for board chairs of comparable companies.

Under our non-employee director compensation policy in effect through December 31, 2015, each individual who was not an employee and who was initially appointed or elected to our Board of Directors was granted stock options to purchase 10,084 shares of our common stock under our 2014 Equity Plan at the time of his or her initial appointment or election to our Board of Directors, which vested annually in equal installments over a three-year period. In addition, each continuing non-employee

director was eligible to receive, on the first business day following January 1st of each calendar year, an annual grant of stock options to purchase 5,042 shares of our common stock under our 2014 Equity Plan, which vests in full on the first anniversary of the grant date. The stock options were granted with an exercise price equal to the fair market value of a share of our common stock on the date of grant and have a 10-year term.

In December 2015, after reviewing market data for non-employee board compensation of comparable companies provided by Pay Governance, our Compensation Committee recommended, and our Board of Directors approved, an amendment to the non-employee director compensation policy effective January 1, 2016. The amended policy provides that each non-employee director initially appointed or elected to our Board of Directors will be eligible to be granted stock options to purchase 25,000 shares of our common stock under our 2014 Equity Plan at the time of his or her initial appointment or election which vest annually in equal installments over a three-year period. The policy also provides that each non-employee director will be eligible to be granted stock options to purchase 15,000 shares of our common stock, which vest in full on the first anniversary of the grant date, with such grants to be made on the date of the Company's annual meeting of stockholders for the relevant year or as soon thereafter as is reasonably practicable, subject to the non-employee director remaining in service on such date. The annual awards of stock options for 2016 will be made at the 2016 annual meeting of stockholders and not on January 4, 2016.

Director Agreements

Dr. Siber

We entered into a consulting agreement with Dr. Siber dated May 16, 2007, as amended on June 30, 2009, December 16, 2010, June 15, 2011, June 5, 2013 and June 15, 2015, providing for a consulting fee of \$5,000 per month, for consulting services performed by Dr. Siber related to strategic scientific and business development as well as for his service on our Board of Directors. Dr. Siber was also entitled to receive grants of restricted stock and stock options in connection with his service to us. All stock options granted to Dr. Siber pursuant to the consulting agreement will fully vest if, within 12 months following a change of control of our Company, either we (or our successor) terminate the consulting agreement without cause (as such term is described in the consulting agreement), or we (or our successor) do not offer to extend the term of the agreement.

Dr. Siber has agreed not to solicit our employees, contractors, and customers for a period of 12 months following the termination of the consulting agreement and is subject to covenants relating to the use and disclosure of confidential information and the assignment of inventions. Unless extended or earlier terminated, the term of the consulting agreement will expire on June 17, 2017.

Director Compensation

The following table sets forth information concerning the compensation earned by our non-employee directors during 2015. All of our non-employee directors were compensated for service on our Board of Directors under our non-employee director compensation policy. Mr. Clark receives no additional compensation for his service as a director, and, consequently, is not included in this table. The compensation received by Mr. Clark as our chief executive officer during 2015 is set forth in the "Summary Compensation Table" under the section "Executive Compensation".

| Name | Fees earned or paid in cash (\$)(1) | Option awards (\$)(2)(3) | Total (\$) |
|------------------------|-------------------------------------|--------------------------|------------|
| Kenneth Bate | 53,334 | 45,781 | 99,115 |
| Kevin Bitterman, Ph.D. | 43,500 | 45,781 | 89,281 |

| | | | |
|------------------------------|---------|--------|---------|
| Katrine Bosley | 74,500 | 45,781 | 120,281 |
| Michael Higgins | 42,014 | 91,563 | 133,577 |
| Stephen Hoffman, M.D., Ph.D. | 41,083 | 45,781 | 86,864 |
| George Siber, M.D. | 138,681 | 45,781 | 184,462 |

Amounts represent annual director fees and, in the case of Dr. Siber, include consulting fees, for services rendered.
(1) Consulting fees paid to Dr. Siber were paid in equal bi-monthly installments and all other fees were paid quarterly in arrears.

As of December 31, 2015, our directors held the following aggregate number of options to purchase shares of our
(2) common stock: Mr. Bate held options to purchase 15,126 shares of our common stock, Dr. Bitterman held options to

purchase 5,042 shares of our common stock, Ms. Bosley held options to purchase 42,008 shares of our common stock, Mr. Higgins held options to purchase 10,084 shares of our common stock, Dr. Hoffman held options to purchase 5,042 shares of our common stock, and Dr. Siber held options to purchase 138,708 shares of our common stock. As of December 31, 2015, Ms. Bosley held 9,717 restricted shares, which she received upon the exercise of the option granted to her on February 4, 2013.

(3) Amount in the table represent the aggregate grant date fair value of the option to purchase 10,084 shares of our common stock granted to Mr. Higgins in February 2015, upon his election to our Board of Directors, pursuant to our non-employee director compensation policy. This stock option award will vest in equal installments on each of the first three anniversaries of the date of grant. All other directors received grants of time-based stock options to purchase 5,042 shares of our common stock that vest in full on the one-year anniversary of the respective dates of grant. These grant date fair value amounts were computed in accordance with ASC 718 and exclude the value of estimated forfeitures. Assumptions used in the calculation of these amounts are included in Note 10 to our financial statements included in our Annual Report.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Our directors, executive officers and beneficial owners of more than 10% of our common stock are required under Section 16(a) of the Securities and Exchange Act of 1934 (the "Exchange Act"), to file reports of ownership and changes in ownership of our securities with the SEC. To our knowledge, based solely on review of these filings and written representations from the certain reporting persons, we believe that during the year ended December 31, 2015, our officers, directors and beneficial owners of more than 10% of our common stock have filed the appropriate forms under Section 16(a) of the Exchange Act at the time of filing our Annual Report.

AUDIT COMMITTEE REPORT

The Audit Committee reviewed the Genoccea audited financial statements for the year ended December 31, 2015 and discussed these statements with management and Ernst & Young LLP, the Company's independent registered public accounting firm. Genoccea 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, discussing 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, Ernst & Young LLP all communications required under the standards of the Public Company Accounting Oversight Board (the "PCAOB"), including the matters required to be discussed by Ernst & Young LLP with the Audit Committee, including the matters to be discussed by Statement on Auditing Standards No. 61, as amended, as adopted by the PCAOB in Rule 3200T.

Ernst & Young LLP also provided the Audit Committee with the written disclosures and the letter required under the PCAOB, which requires that independent registered public accounting firms annually 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 reviewed this disclosure and discussed with Ernst & Young LLP their independence from Genoccea.

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

Genocea Annual Report on Form 10-K for the year ended December 31, 2015, for filing with the SEC.

Respectfully submitted by the

Audit Committee,

Michael Higgins, Chair
Kenneth Bate

Katrine Bosley

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EXECUTIVE COMPENSATION

Our named executive officers for the fiscal year ended December 31, 2015 were:

• William Clark, our President and Chief Executive Officer;
• Seth Hetherington, M.D., our Chief Medical Officer; and
• Jonathan Poole, our Chief Financial Officer.

Executive Compensation

Each year, our Compensation Committee considers a variety of factors in assessing the competitiveness of our executive compensation program and the individual compensation of each of our executives, including our named executive officers. These factors include an executive's experience and individual performance, the Company's performance as a whole, data from surveys as well as compensation paid at companies in our peer group, as described below, cost of living increases and general industry conditions. Our Compensation Committee does not assign any specific weighting to any one factor.

Market Benchmarks and Competitive Analysis

As discussed above, our Compensation Committee engaged Radford as its independent compensation consultant for part of 2015. Radford assisted the Compensation Committee in the development of a list of our peer companies used for compensation-related purposes. In determining our peer companies, we selected companies that are publicly traded, that operate in our industry and have a similar market capitalization, and that are of comparable size and scientific stage of development. When making compensation decisions, our Compensation Committee also considered data from a specialized subset of Radford's Global Life Sciences compensation survey representing publicly traded companies in the biopharmaceutical industry with employee populations in the range of 25 to 220 employees and a market capitalization of \$75 to \$500 million.

Elements of Executive Compensation

The compensation of our named executive officers consists of base salary, annual cash bonuses and equity awards as well as employee benefits that are made available to our salaried employees. Our named executive officers are also entitled to certain compensation and benefits upon certain terminations of employment and change of control transactions pursuant to employment letter agreements.

Base Salaries. Base salaries for our named executive officers are reviewed annually by our Compensation Committee and are set by our Board of Directors. When making its base salary recommendations to our Board of Directors, our Compensation Committee takes the factors described above into account, but does not assign any specific weighting to any one factor. Our Board of Directors determines each named executive officer's base salary after reviewing the Compensation Committee's recommendation with respect to such salaries. In fiscal year 2015, on the recommendation of our Compensation Committee, our Board of Directors approved a base salary of \$432,984 for Mr. Clark, \$380,542 for Dr. Hetherington, and \$329,600 for Mr. Poole, representing increases of 8.4%, 3.0% and 3.0%, respectively, from the base salary for each such executive in 2014.

Annual Cash Bonuses. Our annual cash bonus program promotes and rewards the achievement of key strategic business goals and individual performance goals. For fiscal year 2015, the target annual bonus as a percentage of base salary was 50% for Mr. Clark and 35% for each of Dr. Hetherington and Mr. Poole. In the case of Mr. Clark, 100% of his annual bonus was based on the achievement of pre-established corporate performance goals and, in the case of Dr. Hetherington and Mr. Poole, 50% of their respective annual bonuses was based on the achievement of pre-established corporate performance goals and 50% was based on a quantitative and qualitative assessment of

pre-established individual performance goals.

At the beginning of fiscal year 2015, our Compensation Committee established the corporate performance goals for fiscal year 2015, with each goal having a designated weighting. These corporate performance goals included key strategic and financial goals related to business development collaborations and financings, cash management, the development and commencement of certain clinical and commercial programs, and other strategic objectives related to our clinical pipeline. Also at the beginning of fiscal year 2015, our Chief Executive Officer, working with Dr. Hetherington and Mr. Poole, established their respective individual performance goals and their weightings. These goals included, to the extent applicable to the executive, objectives related to oversight of clinical activities for compliance with laws, developing and conducting clinical

programs and studies, research and development, managing studies according to schedule and within budgets, business and corporate development and demonstrating leadership with respect to direct reports.

In January 2016, our Compensation Committee met to review and consider the level of corporate and individual performance goals that were achieved for purposes of making its recommendation to our Board of Directors regarding the amount of the annual cash bonus to be paid to each of our named executive officers for fiscal year 2015. The Compensation Committee reviewed and evaluated our performance against the pre-established corporate performance goals for fiscal year 2015, taking into consideration Mr. Clark's evaluation of our performance in 2015. With respect to the individual performance goals applicable to Dr. Hetherington and Mr. Poole, our Compensation Committee also considered Mr. Clark's determination that Dr. Hetherington and Mr. Poole had achieved 85% and 120%, respectively, of such individual's performance goals. After reviewing the achievement of the fiscal year 2015 corporate performance goals, and after considering Mr. Clark's determination regarding the level of achievement of individual performance goals, our Compensation Committee recommended, and our Board of Directors approved, an 80% level of achievement of corporate performance goals, the level of achievement of individual goals described above, and a fiscal year 2015 cash bonus of \$173,200 for Mr. Clark, \$109,881 for Dr. Hetherington, and \$115,360 for Mr. Poole.

Equity Awards. Our named executive officers are eligible to participate in the Genoccea Biosciences, Inc. 2014 Equity Incentive Plan ("2014 Equity Plan"). Our 2014 Equity Plan was adopted by our Board of Directors in connection with our initial public offering ("IPO"). Mr. Clark and Dr. Hetherington have also each been granted equity awards under the Genoccea Biosciences, Inc. Amended and Restated 2007 Equity Incentive Plan ("2007 Equity Plan"). Following the adoption of the 2014 Equity Plan and our IPO, all equity-based awards have been and will be granted under our 2014 Equity Plan and no future awards will be made under the 2007 Equity Plan.

In February 2015, Mr. Clark, Dr. Hetherington, and Mr. Poole each received awards of time-vesting stock options to purchase 138,000, 51,000, and 95,000 shares, respectively, of our common stock under the 2014 Equity Plan. These stock options vest in equal monthly installments over the 48 months following the date of grant, generally subject to each executive's continued employment.

Stock option awards serve to align the interests of our named executive officers with our shareholders because no value is created unless the value of our common stock appreciates after grant. Stock option awards also encourage retention through the use of time-based vesting conditions. We have in the past also granted stock options that are subject to performance-based vesting conditions, thereby incentivizing the achievement of key strategic goals. Pursuant to employment letter agreements with our named executive officers, their stock option awards will vest automatically upon certain terminations of employment following a change of control of our Company. See "Employment Letter Agreements" below for additional details about these agreements.

Benefits. We provide modest benefits to our named executive officers, which are limited to participation in our 401(k) plan and basic health and welfare benefit coverage. These benefits are available to all of our salaried employees.

Employment Letter Agreements. We have entered into an employment letter agreement with each of our named executive officers that, in each case, includes severance and change of control protections. Our named executive officers are also subject to restrictive covenants, covering noncompetition, nonsolicitation and confidentiality. See "Employment Letter Agreements" below for additional details about these agreements.

Summary Compensation Table

The following table sets forth information about compensation awarded or paid to our named executive officers for fiscal years 2015 and 2014, in the case of all of our named executive officers, and 2013, in the case of Mr. Clark and Dr. Hetherington.

| Name and principal position | Year | Salary (\$)(2) | Bonus (\$)(3) | Option awards (\$)(4) | Nonequity incentive plan compensation (\$)(5) | All other compensation (\$)(6) | Total (\$) |
|---|------|-------------------|------------------|-----------------------------|---|--------------------------------------|---------------|
| William Clark, President and Chief Executive Officer | 2015 | 427,392 | — | 901,154 | 173,200 | 4,162 | 1,505,908 |
| | 2014 | 393,561 | — | — | 179,744 | — | 573,305 |
| | 2013 | 334,280 | — | 413,842 | 107,320 | — | 855,442 |
| Seth Hetherington, M.D., Chief Medical Officer | 2015 | 378,695 | — | 333,035 | 109,881 | 7,950 | 829,561 |
| | 2014 | 366,074 | — | — | 119,612 | — | 485,686 |
| | 2013 | 331,459 | — | 176,616 | 88,989 | — | 597,064 |
| Jonathan Poole, Chief Financial Officer (1) | 2015 | 328,000 | — | 620,360 | 115,360 | 7,295 | 1,071,015 |
| | 2014 | 235,151 | 50,000 | 2,904,505 | 78,540 | — | 3,268,196 |

Mr. Poole commenced employment with the Company in April 2014. As a result, no amounts with respect to fiscal (1) year 2013 have been included for Mr. Poole in the table above. Amounts in the table for fiscal year 2014 represent Mr. Poole's compensation for the period he was employed by us.

(2) Salaries include amounts contributed by the named executive officer to our 401(k) plan.

(3) Amount reflects the signing bonus paid to Mr. Poole in connection with the commencement of his employment with us.

Amounts shown reflect the aggregate grant date fair value of time-vesting stock options awarded in the respective fiscal year computed in accordance with Financial Accounting Standards Board Accounting Standards Codification ("FASB ASC"), Topic 718, Compensation — Stock Compensation ("ASC 718"), and exclude the value of estimated forfeitures. Assumptions used in the calculation of these amounts are included in Note 10 to our consolidated financial statements included in our Annual Report. Mr. Clark was also granted a performance-vesting stock option in fiscal year 2013. The grant date fair value of the performance-vesting stock option granted to Mr. Clark in fiscal year 2013 was based on the probable outcome of the performance conditions associated with the stock option as of the date of grant. No amount has been included in the table above for this stock option since the performance (4) conditions were not considered probable to occur on the date of grant in fiscal year 2013. The aggregate grant date fair value of this performance-vesting stock option if the highest levels of performance conditions were achieved is \$252,981. This performance-vesting stock option awarded to Mr. Clark in fiscal year 2013 vested in full upon the completion of our IPO on February 10, 2014. The grant date fair values of the stock options granted to each of Mr. Clark, Mr. Hetherington and Mr. Poole in fiscal year 2015 are lower than the amounts listed for such grants in the summary compensation table included in our 2015 Annual Report because the ASC 718 grant date fair value was used to determine grant date values in the table above (disregarding the effect of estimated forfeitures) rather than the market value at the date of the award.

Amounts shown reflect the annual cash bonuses paid, or to be paid, in the case of fiscal year 2015, to the named (5) executive officers that was earned based on the achievement of Company performance goals, in the case of

Mr. Clark, and Company and individual performance goals, in the case of Dr. Hetherington and Mr. Poole.

(6) Amounts shown reflect employer matching contributions under our 401(k) plan during fiscal year 2015.

Outstanding Equity Awards at Fiscal Year-End

The following table sets forth information regarding equity awards held by our named executive officers as of December 31, 2015. Our named executive officers do not hold any equity awards other than stock options.

OPTION AWARDS

| Name | Number of securities underlying unexercised options (#) exercisable) | Number of securities underlying unexercised options (#) unexercisable | Equity incentive plan awards: | | Option Exercise Price (\$)(5) | Option Expiration Date(6) | |
|-------------------------|--|---|--|--|-------------------------------|---------------------------|-----------|
| | | | Number of securities underlying unexercised options (#) unearned options (#) | Number of securities underlying unexercised options (#) unearned options (#) | | | |
| William Clark | 24,716 | (1) | — | — | \$ 2.86 | 12/17/2020 | |
| | — | — | — | 39,807 | (2) \$ 2.86 | 12/17/2020 | |
| | 340,568 | (1) | — | — | \$ 2.02 | 2/17/2021 | |
| | 97,418 | (3) | 36,184 | (3) | — | \$ 3.45 | 7/25/2023 |
| | 81,670 | (2) | — | — | — | \$ 3.45 | 7/25/2023 |
| Seth Hetherington, M.D. | 28,750 | (1) | 109,250 | (1) | — | \$ 9.08 | 2/26/2025 |
| | 66,955 | (4) | — | — | — | \$ 2.02 | 2/17/2021 |
| | 11,562 | (2) | — | — | — | \$ 2.02 | 2/17/2021 |
| | 41,575 | (3) | 15,442 | (3) | — | \$ 3.45 | 7/25/2023 |
| Jonathan Poole | 10,625 | (1) | 40,375 | (1) | — | \$ 9.08 | 2/26/2025 |
| | 83,636 | (4) | 117,090 | (4) | — | \$ 17.89 | 4/7/2024 |
| | 19,791 | (1) | 75,209 | (1) | — | \$ 9.08 | 2/26/2025 |

- (1) Reflects time-based stock options to purchase shares of our common stock that vest in 48 equal monthly installments following the date of grant, generally subject to the executive's continued employment.
- (2) Reflects performance-based stock options to purchase shares of our common stock that vest as to 100% of the shares subject to the stock option, in the case of Mr. Clark, upon the company's achievement of specified strategic financing or development milestones, and in the case of Dr. Hetherington, upon the company's achievement of a milestone related to the initiation of a clinical trial, in each case, generally subject to the executive's continued employment. The performance-based stock option awarded to Mr. Clark on July 25, 2013 vested in full upon the completion of our IPO on February 10, 2014. The performance-based stock option awarded to Mr. Clark on December 17, 2010 remains unvested as the performance condition has not yet been achieved. The performance-based stock option awarded to Dr. Hetherington vested in full in fiscal year 2012.
- (3) Reflects time-based stock options to purchase shares of our common stock that vested as to 1/8th of the shares subject to the stock option on the date of grant and that continue to vest in equal monthly installments over 42 months following the date of grant, generally subject to the executive's continued employment.
- (4) Reflects time-based stock options to purchase shares of our common stock that vest as to 25% of the shares subject to the stock option on the vesting commencement date (approximately 12 months from the grant date) and thereafter vest in equal monthly installments over the following 36 months, generally subject to the executive's continued employment.
- (5) The exercise price of the stock options is not less than the fair market value of a share of our common stock, as determined by our Board of Directors. For stock options granted following our IPO, the exercise price is the closing price of a share of our common stock on the date of grant of the stock option.
- (6) All stock options have a 10-year term measured from the date of grant.

Retirement Benefits

We do not maintain any qualified or non-qualified defined benefit plans or supplemental executive retirement plans that cover our named executive officers. We offer a tax-qualified retirement plan, which we refer to as our 401(k) plan, to eligible employees, including our named executive officers. Our 401(k) plan permits eligible employees to defer their annual eligible

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compensation subject to the limitations imposed by the Internal Revenue Service. We may, but are not required to, make discretionary profit-sharing contributions on behalf of eligible employees under this plan. In fiscal year 2015, we commenced making an employer match of up to 50% for the first 6% of employee contributions. Employer matching contributions vest over a four-year period starting with the employee's date of hire. Mr. Clark and Dr. Hetherington have met the vesting requirements based upon the amount of time they have been employed by us, while Mr. Poole is partially vested in the matching contributions based upon his April 2014 date of hire.

Employment Letter Agreements

We have entered into employment letter agreements with each of our named executive officers. On January 16, 2014, we entered into an amended and restated employment letter agreement with each of Mr. Clark and Dr. Hetherington, each of which became effective prior to the completion of our IPO. We also entered into an employment letter agreement with Mr. Poole, who began serving as our Chief Financial Officer on April 7, 2014. Each employment letter agreement provides for an initial base salary which has subsequently been increased, as well as a discretionary performance-based bonus, with a target, as a percentage of their base salaries, of 50% for Mr. Clark and 35% for each of Dr. Hetherington and Mr. Poole. In addition, pursuant to Mr. Poole's employment letter agreement, he was entitled a cash signing bonus of \$50,000, payable within 30 days of the commencement of his employment, and a stock option to purchase 200,726 shares of our common stock (which was equal to 1% of the total number of shares of our common stock outstanding on a fully diluted basis on the date of grant) granted under the 2014 Equity Plan. Each agreement also provides for severance payments and benefits upon certain terminations of the executive's employment as described below.

Termination of Employment without Cause or for Good Reason Following a Change of Control. If, within 12 months after a change of control (as defined in the executive's employment letter agreement), the executive's employment is terminated by us without cause or the executive terminates his employment for good reason (as such terms are defined in the executive's employment letter agreement), all stock options or other equity awards then held by the executive will fully vest. In addition, the executive will be entitled to receive base salary and payment of COBRA premiums for 18 months, in the case of Mr. Clark, or 15 months, in the case of Dr. Hetherington and Mr. Poole, following such termination of employment.

Termination of Employment without Cause or for Good Reason. If the executive's employment is terminated by us without cause or the executive terminates his employment for good reason (as such terms are defined in the executive's employment letter agreement) other than following a change of control as described above, the executive will be entitled to receive base salary and payment of COBRA premiums for 12 months, in the case of Mr. Clark, or nine months, in the case of Dr. Hetherington and Mr. Poole, following such termination of employment.

Termination of Employment Due to Death or Disability. If the executive's employment is terminated by us due to the executive's disability or is terminated due to the executive's death, we will pay the executive a portion of the executive's target annual cash bonus for the year in which such termination of employment occurs, prorated based on the number of days the executive was employed during such year until the date of such termination.

Severance Subject to Release of Claims. Our obligation to provide the executive with any severance payments or other benefits under the executive's employment letter agreement is conditioned on the executive signing and not revoking an effective release of claims in our favor.

Other Termination of Employment. If the executive's employment is terminated for any reason other than by us without cause, by the executive for good reason, or due to the executive's death or disability, the executive will only be entitled to receive earned but unpaid base salary and any accrued but not used vacation as of the termination date.

280G Better-of Provision. In the event of a change in ownership or control of our Company under Section 280G of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, if any portion of the payments made pursuant to the executive's employment letter agreement (or otherwise) constitutes an "excess parachute payment" within the meaning of Section 280G of the Code, the executive will be entitled to receive an amount of such payments reduced so that no portion of the payments would constitute an excess parachute payment, or the amount otherwise payable to the executive under the employment letter agreement (or otherwise) reduced by all applicable taxes, including the excise tax, whichever amount results in the greater amount payable to the executive on an after-tax basis.

Employment Conditioned on Restrictive Covenants. As a condition to the executive's employment with us, the executive was required to sign and must comply with the terms of an At-Will Employment, Confidential Information, Invention Assignment and Non-Competition Agreement, pursuant to which the executive has agreed not to compete with us for a period of 12 months following the termination of his employment and not to solicit our employees or independent contractors for a

period of 36 months following the termination of his employment. Each executive has also agreed to covenants relating to the use and disclosure of confidential information and the assignment of inventions.

COMPENSATION COMMITTEE REPORT

The Compensation Committee of our Board of Directors has reviewed and discussed the "Executive Compensation" section of this Proxy Statement, and the information contained herein, with our management. Based on this review and discussion, the Compensation Committee recommended to the Board of Directors that this Executive Compensation section and discussion be included in our Proxy Statement.

Members of the Compensation Committee:

Kenneth Bate, Chair
Kevin Bitterman
Stephen Hoffman

PROPOSAL NO. 2—RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED

We are asking our stockholders to ratify the Audit Committee's selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2015. Although ratification is not required by our amended and restated by-laws or otherwise, the Board of Directors is submitting the selection of Ernst & Young LLP to our stockholders for ratification as a matter of good corporate practice. If the selection is not ratified, the Audit Committee will consider whether it is appropriate to select another independent registered public accounting firm. Even if the selection is ratified, the Audit Committee in its discretion may select a different registered public accounting firm at any time during the year if the committee determines that such a change would be in the best interests of the Company and our stockholders.

The Board of Directors first approved Ernst & Young LLP as our independent registered public accounting firm in 2009, and Ernst & Young LLP has audited our consolidated financial statements at December 31, 2015 and 2014, and for the years ended December 31, 2015, 2014 and 2013. Representatives of Ernst & Young LLP are expected to be present at the Annual Meeting. They will be given an opportunity to make a statement at the Annual Meeting if they desire to do so, and they will be available to respond to appropriate questions.

The Audit Committee pre-approves all audit and permitted non-audit services (including the fees and terms thereof) to be performed by Ernst & Young LLP, subject to the de minimis exception for non-audit services that are approved by the Audit Committee prior to the completion of an audit. The Audit Committee may delegate pre-approval authority to one or more members of the Audit Committee consistent with applicable law and listing standards, provided that the decisions of such Audit Committee member or members must be presented to the full Audit Committee at its next scheduled meeting. All of the services described in the following fee table were approved in conformity with the Audit Committee's pre-approval process.

Principal Accountant Fees and Services

We regularly review the services and fees of our independent registered public accounting firm. These services and fees are also reviewed by the Audit Committee on an annual basis. The aggregate fees billed for the fiscal years ended December 31, 2015 and 2014 for each of the following categories of services are as follows:

| Fee Category | 2015 | 2014 |
|--------------------|-----------|-----------|
| Audit Fees | \$636,922 | \$559,117 |
| Audit-Related Fees | — | — |
| Tax Fees | — | — |
| All Other Fees | — | — |
| Total Fees | \$636,922 | \$559,117 |

Audit Fees. Consists of fees billed for professional services rendered for the audit of our annual financial statements, the review of interim financial statements and services provided in connection with our registration statements on Form S-1, Form S-3, and Form S-8.

Audit-Related Fees. Consist of fees billed for assurance and related services that are reasonably related to the performance of the audit or review of our financial statements and are not reported under Audit Fees.

Tax Fees. Consists of fees billed for tax compliance, tax advice and tax planning and includes fees for tax return preparation.

All Other Fees. Consists of all other fees billed other than those described above under Audit Fees, Audit-Related Fees and Tax Fees.

All of the services under the captions "Audit-Related Fees," "Tax Fees," and "All Other Fees" were pre-approved by our Audit Committee.

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Pre-Approval Policies and Procedures

Our Audit Committee has adopted policies and procedures relating to the approval of all audit and non-audit services that are to be performed by our registered public accounting firm. This policy generally provides that we will not engage our registered public accounting firm to render audit or non-audit services unless the service is specifically approved in advance by our Audit Committee or the engagement is entered into pursuant to one of the pre-approval procedures described below.

From time to time, our Audit Committee may pre-approve specified types of services that are expected to be provided to us by our registered public accounting firm during the next 12 months. Any such pre-approval is detailed as to the particular service or type of services to be provided and is also generally subject to a maximum dollar amount.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE
FOR
THE RATIFICATION OF THE APPOINTMENT OF ERNST & YOUNG LLP AS THE COMPANY'S
INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM.

(PROPOSAL 2 ON YOUR PROXY CARD)

BENEFICIAL OWNERSHIP OF COMMON STOCK

The following table sets forth information relating to the beneficial ownership of our common stock as of March 31, 2016, by: each person, or group of affiliated persons, known by us to beneficially own more than 5% of our outstanding shares of common stock; each of our directors; each of our named executive officers; and all directors and executive officers as a group.

The percentage of shares beneficially owned is computed on the basis of 28,155,302 shares of our common stock outstanding as of March 31, 2016. The number of shares beneficially owned by each entity, person, director or executive officer is determined in accordance with the rules of SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Shares of our common stock that a person has the right to acquire within 60 days of March 31, 2016 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Genoccea Biosciences, Inc., Cambridge Discovery Park, 100 Acorn Park Drive, Cambridge, MA 02140.

| Name and Address of Beneficial Owned | Number of Shares Beneficially Owned | Percentage of Shares Beneficially Owned | |
|---|--|--|---|
| 5% or greater stockholders: | | | |
| FMR LLC, and related funds(1) 245 Summer Street Boston, MA 02210 | 4,217,255 | 15.0 | % |
| Franklin Advisers, Inc.(2) One Franklin Parkway San Mateo, CA 94403 | 2,886,600 | 10.3 | % |
| S.R. One, Limited(3) c/o Corporation Service Company 2595 Interstate Drive, Suite 103 Harrisburg, PA 17110 | 2,121,668 | 7.5 | % |
| Skyline Venture Partners V, L.P.(4) 525 University Avenue, Suite 610 Palo Alto, CA 94301 | 1,992,415 | 7.1 | % |
| Polaris Venture Partners, and related funds(5) 650 East Kendall Street, 4th Floor Cambridge, MA 02142 | 1,968,606 | 7.0 | % |
| Directors and Named Executive Officers: | | | |
| William Clark(6) | 666,816 | 2.4 | % |
| Seth Hetherington, M.D.(7) | 169,217 | * | |
| Jonathan Poole(8) | 146,879 | * | |
| Kenneth Bate (9) | 8,403 | * | |
| Katrine Bosley(10) | 53,530 | * | |
| Kevin Bitterman, Ph.D.(11) | 1,973,648 | 7.0 | % |
| Michael Higgins(12) | 3,361 | * | |
| Stephen Hoffman, M.D., Ph.D.(13) | 1,997,457 | 7.1 | % |
| George Siber, M.D.(14) | 116,852 | * | |
| All executive officers and directors as a group (12 persons)(15) | 5,372,802 | 19.1 | % |

*Represents beneficial ownership of less than one percent of our outstanding common stock.

Consists of 4,217,255 shares of common stock held by FMR LLC. Abigail Johnson, the Vice Chairman, the Chief Executive Officer, and the President of FMR LLC, has sole power to dispose of the 4,217,255 shares owned by (1)FMR LLC. Members of the family of Johnson Family, including Abigail Johnson, are the predominant owners, directly or through trusts, of Series B voting common shares of FMR LLC, representing 49% of the voting power of FMR LLC.

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For information regarding FMR LLC and its affiliates, we have relied on the Schedule 13G filed by FMR LLC with the SEC on February 12, 2016.

Consists of 2,886,600 shares of common stock beneficially owned by one or more open- or closed-end investment companies or other managed accounts that are investment management clients of investment managers that are direct and indirect subsidiaries (each, an "Investment Management Subsidiary" and, collectively, the "Investment Management Subsidiaries") of Franklin Resources Inc. ("FRI"), including Franklin Advisers, Inc. Investment management contracts grant to the Investment Management Subsidiaries investment and/or voting power over the securities owned by such investment management clients. Franklin Advisers, Inc. has sole voting power over (2) 2,886,600 shares of common stock. Franklin Biotechnology Discovery Fund, a sub-fund of Franklin Templeton Investment Funds, a Luxembourg registered SICAV has an interest in 1,796,800 shares of common stock. Charles B. Johnson and Rupert H. Johnson, Jr. (the "Principal Shareholders") each own in excess of 10% of the outstanding common stock of FRI and are the principal shareholders of FRI. FRI, the Principal Shareholders and each of the Investment Management Subsidiaries disclaim any pecuniary interest or beneficial ownership in any of these shares. For information regarding Franklin Advisers, Inc. and FRI, we have relied on the Schedule 13G/A filed by Franklin Advisers, Inc. with the SEC on February 10, 2016.

(3) Consists of 2,121,668 shares of common stock held by S.R. One, Limited, an indirect, wholly-owned subsidiary of GlaxoSmithKline plc.

Consists of 1,992,415 shares of common stock held by Skyline Venture Partners V, L.P. ("Skyline"). The general partner of Skyline is Skyline Venture Management V, LLC. John G. Freund and Yasunori Kaneko are Managers of Skyline Venture Management V, LLC and hereby disclaim beneficial ownership of all the shares held by Skyline (4) except to the extent of his respective proportionate pecuniary interest therein. Stephen Hoffman has an assignee interest in Skyline. To the extent that he is deemed to share voting and investment powers with respect to the shares held by the Skyline Venture Funds, Dr. Hoffman disclaims beneficial ownership of all the shares held by the funds except to the extent of his proportionate pecuniary interest therein.

Consists of (i) 1,899,578 shares of common stock held by Polaris Venture Partners V, L.P., (ii) 37,019 shares of common stock held by Polaris Venture Partners Entrepreneurs' Fund, L.P., (iii) 13,012 shares of common stock held by Polaris Venture Partners Founders' Fund V, L.P., and (iv) 18,997 shares of common stock held by Polaris Venture Partners Special Founders' Fund V, L.P. (together with Polaris Venture Partners V, L.P., Polaris Venture Partners Entrepreneurs' Fund, L.P. and Polaris Venture Partners Founders' Fund V, L.P., the "Polaris Funds"). North Star Venture Management 2000, LLC directly or indirectly provides investment advisory services to various venture capital funds, including the Polaris Funds. Jonathan Flint and Terrance McGuire, managing members of North Star Venture Management 2000, LLC, exercise voting and investment power with respect to North Star Venture Management, 2000. Each of the Polaris Funds has the sole voting and investment power with respect to the shares of the Company directly held by the applicable Polaris Fund. The respective general partners of the Polaris Funds may be deemed to have sole voting and investment power with respect to the shares held by such funds. The respective general partners disclaim beneficial ownership of all the shares held by the Polaris Funds (5) except to the extent of their proportionate pecuniary interests therein. The members of North Star Venture Management 2000, LLC (the Polaris Management Members) are also members of Polaris Venture Management Co., V, L.L.C. (the general partner of each of the Polaris Funds). Jonathan Flint and Terrance McGuire, managing members of Polaris Venture Management Co. V, L.L.C., exercise voting and investment power with respect to Polaris Venture Management Co. V, L.L.C. As members of the general partner and North Star Venture Management 2000, LLC, the Polaris Management Members may be deemed to share voting and investment powers for the shares held by the Polaris Funds. The Polaris Management Members disclaim beneficial ownership of all such shares held by the funds except to the extent of their proportionate pecuniary interests therein. Kevin Bitterman, a director of the Company, has an assignee interest in Polaris Venture Management Co. V, L.L.C. To the extent that he is deemed to share voting and investment powers with respect to the shares held by the Polaris Funds, Dr. Bitterman disclaims beneficial ownership of all the shares held by the funds except to the extent of his proportionate pecuniary interest therein.

(6)

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Consists of 47,405 shares of common stock, 596,095 shares of common stock that can be acquired upon the exercise of outstanding options and 23,316 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

Consists of 21,000 shares of common stock, 139,549 shares of common stock that can be acquired upon the (7) exercise of outstanding options and 8,668 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

Consists of 4,213 shares of common stock, 124,721 shares of common stock that can be acquired upon the exercise (8) of outstanding options and 17,945 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

(9) Consists of 8,403 shares of common stock that can be acquired upon the exercise of outstanding options.

Consists of 31,092 shares of common stock, 19,602 shares of common stock that can be acquired upon the (10) exercise of outstanding options and 2,836 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

Consists of 1,968,606 shares of common stock held by Polaris Venture Partners or related funds. By virtue of the relationships described in footnote 5 above, Dr. Bitterman may be deemed to share beneficial ownership in the (11) shares held by Polaris Venture Partners or related funds. Dr. Bitterman disclaims beneficial ownership of the shares referred to in footnote 5 above. Also consists of 5,042 shares of common stock that can be acquired upon the exercise of outstanding options.

(12) Consists of 3,361 shares of common stock that can be acquired upon the exercise of outstanding options.

Consists of 1,992,415 shares of common stock held by Skyline or related funds. By virtue of the relationships described in footnote 4 above, Dr. Hoffman may be deemed to share beneficial ownership in the shares held by (13) Skyline or related funds. Dr. Hoffman disclaims beneficial ownership of the shares referred to in footnote 4 above. Also consists of 5,042 shares of common stock that can be acquired upon the exercise of outstanding options.

Consists of 2,016 shares of common stock, 113,553 shares of common stock that can be acquired upon the (14) exercise of outstanding options and 1,283 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

Consists of 4,080,324 shares of common stock, 1,210,772 shares of common stock that can be acquired upon the (15) exercise of outstanding options, and 81,706 shares of common stock that can be acquired upon the exercise of options within 60 days of March 31, 2016.

CERTAIN RELATIONSHIPS AND RELATED PERSON TRANSACTIONS

The following is a description of transactions since January 2015, to which we have been a party, in which the amount involved exceeded or will exceed \$120,000, and in which any related person had a direct or indirect material interest.

Participation in Equity Offerings

In March 2015, we completed an underwritten public offering of 6.3 million shares of our common stock at a public offering price of \$8.25 per share for an aggregate offering price of \$51.7 million (the "March 2015 Offering"). In August 2015, we completed another underwritten public offering of 3.9 million shares of our common stock at a public offering price of \$13.00 per share for an aggregate offering price of \$50.1 million (the "August 2015 Offering"). The following table sets forth the number of shares of our common stock that were purchased by our 5% stockholders and their affiliates in these offerings:

| Investor | Number of Shares of Common Stock | |
|--------------------------|-------------------------------------|----------------------------|
| | March 2015 Offering | August 2015 Offering |
| FMR LLC | 730,000 | 550,000 |
| S.R. One, Limited | 300,000 | 150,000 |
| Franklin Advisers | 850,000 | 175,000 |
| Skyline Venture Partners | 700,000 | — |

Indemnification Agreements

We entered into indemnification agreements with each of our directors and executive officers. These agreements will require us to indemnify these individuals and, in certain cases, affiliates of such individuals, to the fullest extent permissible under Delaware law against liabilities that may arise by reason of their service to us or at our direction, and to advance expenses incurred as a result of any proceeding against them as to which they could be indemnified.

Registration Rights Agreement

We are a party to a registration rights agreement with certain holders of common stock, including some of our directors, executive officers and 5% stockholders and their affiliates and entities affiliated with our directors. The registration rights agreement provides these holders the right to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing.

Transactions with Our Executive Officers, Directors and 5% Stockholders

On May 16, 2007, we entered into a consulting agreement with Dr. George Siber, a member of our Board of Directors. The consulting agreement was amended on each of June 30, 2009, December 16, 2010, June 15, 2011, June 5, 2013 and June 15, 2015 and is in effect through June 17, 2017. Pursuant to the consulting agreement, Dr. Siber performs various consulting services for us, including determining our general scientific and business direction, recruitment of scientific advisory board members and consultants, recruitment of full-time management and scientific personnel and identifying and reviewing scientific developments and intellectual property. Since the beginning of 2012, Dr. Siber has been paid approximately \$5 thousand per month under the consulting agreement. See "The Board of Directors and its Committees — Director Agreements — Dr. Siber" for further details on compensation paid to Dr. Siber under the consulting agreement.

Related Person Transactions Policy

Pursuant to our written related person transaction approval policy, if we want to enter into a transaction with a related person or an affiliate of a related person, our Chief Financial Officer will review the proposed transaction to determine, based on applicable NASDAQ and SEC 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 Chief Financial Officer has either specifically confirmed in writing that no further reviews are necessary or that all requisite corporate reviews have been obtained.

Transactions with related persons

If a related person proposes to enter into such a transaction, arrangement or relationship, which we refer to as a "related person transaction," the related person must report the proposed related person transaction to our principal financial officer or his or her designee. The policy calls for the proposed related person transaction to be reviewed and, if deemed appropriate, approved by our Audit Committee. Whenever practicable, the reporting, review and approval will occur prior to entry into the transaction. If advance review and approval is not practicable, the Audit Committee will review, and, in its discretion, may ratify the related person transaction. The policy also permits the chair of the Audit Committee to review and, if deemed appropriate, approve proposed related person transactions, in which the amount involved does not exceed \$500,000, that arise between Audit Committee meetings, subject to ratification by the Audit Committee at its next meeting. Any related person transactions that are ongoing in nature will be reviewed annually.

A related person transaction reviewed under the policy will be considered approved or ratified if it is authorized by the Audit Committee after full disclosure of the related person's interest in the transaction.

In addition to the transactions that are excluded by the instructions to the SEC's related person transaction disclosure rule, our Board of Directors has determined that the following transactions are pre-approved by the Audit Committee even if the aggregate amount of such transaction exceeds \$120,000:

- employment of executive officers where the related compensation is required to be reported in a proxy statement (general applicable to "named executive officers") or the executive officer is not an immediate family member of another executive officer or director, the related compensation would be reported as compensation in a proxy statement and the Compensation Committee approved (or recommended that the Board of Directors approve) such compensation;
- any compensation paid to a director if the compensation is required to be reported in a proxy statement;
- any transaction with another company at which a related person's only relationship is an employee (other than an executive officer), director of beneficial owner of less than 10% of that company's shares, if the aggregate amount involved does not exceed the greater of \$1 million or 2% of that company's total annual revenues;
- any transaction where our Company is indebted to another company at which a related person's only relationship is an employee (other than an executive officer), director of beneficial owner of less than 10% of that company's shares, if the total amount of our Company's indebtedness to the other company at the end of that company's last completed fiscal year does not exceed 1% of that company's total consolidated assets;
- any transaction where the related person's interest arises solely from the ownership of our Company's common stock and all holders of our Company's common stock received the same benefit on a pro rata basis;
- any transaction involving a related person where the rates or charges involved are determined by competitive bids;
- any transaction with a related person involving the rendering of services as common or contract carrier, or public utility, at rates or charges fixed in conformity with law or governmental authority; or
- any transaction with a related person involving services as a bank depository of funds, transfer agent, registrar, trustee under a trust indenture, or similar services.

GENERAL MATTERS

Code of Business Conduct and Ethics and Corporate Governance Guidelines

We have adopted a Code of Business Conduct and Ethics for our directors, officers and employees. A copy of the Code of Business Conduct and Ethics may be accessed free of charge by visiting our website at <http://ir.genoccea.com/> and going to the "Investor Relations—Corporate Governance" section or by requesting a copy in writing from Jonathan Poole, Secretary, at our Cambridge, Massachusetts office. We intend to post on our website amendments to, or waivers under, a provision of the Code of Business Conduct and Ethics that apply to certain of our executive officers 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 <http://ir.genoccea.com/> and going to the "Investor Relations—Corporate Governance" section or by requesting a copy in writing from Jonathan Poole, Secretary, at our Cambridge, Massachusetts office.

Availability of Certain Documents

A copy of our 2015 Annual Report has been posted on the Internet along with this Proxy Statement. We will mail without charge, upon written request, a copy of our 2015 Annual Report excluding exhibits. Please send a written request to our Corporate Secretary at:

Genoccea Biosciences, Inc.
100 Acorn Park Drive

Cambridge, MA 02140

Attention: Secretary

Only one copy of this Proxy Statement is being delivered to multiple stockholders sharing an address, unless we have received contrary instructions from one or more of the stockholders. We will undertake to deliver promptly, upon written or oral request, a separate copy to a stockholder at a shared address to which a single copy of the Proxy Statement was delivered. You may make a written or oral request by sending a written notification to our Secretary at the address above, providing your name, your shared address, and the address to which we should direct the additional copy of the Proxy Statement. Multiple stockholders sharing an address who have received one copy of the Proxy Statement and would prefer us to mail each stockholder a separate copy of future mailings should contact us at our principal executive offices. Additionally, if current stockholders with a shared address received multiple copies of the Proxy Statement and would prefer us to mail one copy of future mailings to stockholders at the shared address, notification of that request may also be made through our principal executive offices.

Stockholder Proposals and Nominations

Requirements for Stockholder Proposals to be Considered for Inclusion in our Proxy Materials. To be considered for inclusion in next year's Proxy Statement, stockholder proposals pursuant to Rule 14a-8 under the Exchange Act must be received by our Secretary at Genoccea Biosciences, Inc., 100 Acorn Park Drive, Cambridge, MA 02140 no later than 120 days prior to April 21, 2017.

Requirements for Stockholder Proposals to be Brought Before an Annual Meeting. Our amended and restated by-laws provide that, for stockholder nominations to the Board of Directors or other proposals to be considered at an annual meeting, the stockholder must have given timely notice thereof in writing to the Secretary at Genoccea Biosciences, Inc., 100 Acorn Park Drive, Cambridge, MA 02140. To be timely for the 2017 annual meeting, the stockholder's notice must be delivered to or mailed and received by us not more than 120 days, and not less than 90 days, before the anniversary date of the preceding annual meeting, except that if there was no annual meeting in the prior year or if the current year's annual meeting is more than 30 days before or after the anniversary date of the previous year's annual meeting, we must receive the notice not later than the close of business on the tenth day following the day on which we provide notice or public disclosure of the date of the meeting. Such notice must provide the information required by our by-laws with respect to each matter the stockholder proposes to bring before the 2017 annual meeting.

Communications with the Board of Directors

A stockholder may send general communications to our Board of Directors, any committee of our Board of Directors or any individual director by directing such communication to the Jonathan Poole, Secretary, Genoccea Biosciences, Inc., 100 Acorn Park Drive, Cambridge, Massachusetts 02140.

Other Matters

As of the date of this Proxy Statement, the Board of Directors does not intend to present any matters other than those described herein at the Annual Meeting and is unaware of any matters to be presented by other parties. If other matters are properly brought before the Annual Meeting for action by the stockholders, proxies will be voted in accordance with the recommendation of the Board or, in the absence of such a recommendation, in accordance with the judgment of the proxy holder.

Directions to Annual Meeting

Directions to the 2016 Annual Meeting of Stockholders, to be held at Ropes & Gray LLP, Prudential Tower, 800 Boylston Street, Boston, MA 02199 are set forth below:

From North of Boston: From Route 93 take exit 26, Leverett Connector/Storrow Drive, and follow to the Copley Square exit on the left. Take a right onto Beacon Street and follow to Exeter Street. Take a left onto Exeter Street and follow 11 blocks. Take a right on Huntington Avenue. The Prudential Center Garage will be on the right.

From West of Boston: Follow the Mass Pike eastbound into Boston (the Mass Pike is accessible from Route 128/I-95). Get off at exit 22, Copley Square/Prudential Center. Follow signs for Prudential Center. This will take you directly to the Prudential Center Garage entrance, which will be on your right.

From South of Boston: From Route 93 take exit 18, Massachusetts Avenue. Follow sign to Massachusetts Avenue and turn right. Follow Massachusetts Avenue for about 2 miles to Huntington Avenue. Take a right on Huntington Avenue. Take a left on Belvidere Street. The Prudential Center garage entrance will be on your right before Sovereign Bank.

From Logan Airport: Access Boston via the Sumner Tunnel and exit onto Route 93 North. Take exit 26, Leverett Connector/Storrow Drive, and follow to the Copley Square exit on the left. Take a right onto Beacon Street and follow to Exeter Street. Take a left onto Exeter Street and follow 11 blocks. Take a right on Huntington Avenue. The Prudential Center Garage will be on the right.

Parking: The Prudential Tower is best accessed via the South Garage, which has two entrances on Huntington Avenue, one on Dalton Street and one on Belvedere Street. The Red and Yellow levels are both part of the South Garage. Attendant parking is available on both levels at no additional charge.

By Order of the Board of Directors

William Clark
President and Chief Executive Officer
April 21, 2016

