

SCHEDULE 14A INFORMATION

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

Filed by the Registrant x

Filed by a Party other than the Registrant o

Check the appropriate box:

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

ASSEMBLY BIOSCIENCES, INC.

(Name of Registrant as Specified In Its Charter)

Payment of Filing Fee (Check the appropriate box)

- No fee required.
 - Fee computed on table below per Exchange Act Rules 14a-6(i)(4) and 0-11.
 1. Title of each class of securities to which transaction applies:

 2. Aggregate number of securities to which transaction applies:

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

 4. Proposed maximum aggregate value of transaction:

 5. Total fee paid:

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

 2. Form, Schedule or Registration Statement No.:

 3. Filing Party:

 4. Date Filed:

-



assembly
biosciences

ASSEMBLY BIOSCIENCES, INC.
11711 N. Meridian Street, Suite 310
Carmel, IN 46032

**NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
To Be Held Thursday, June 1, 2017**

Dear Stockholders:

You are cordially invited to attend the Annual Meeting of Stockholders (the Annual Meeting) of Assembly Biosciences, Inc., a Delaware corporation (we, us, Assembly or the Company). The Annual Meeting will be held at our offices at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 46032, on Thursday, June 1, 2017, at 9:00 a.m. (EDT) for the following purposes:

- To elect each of our seven nominees for the Board of Directors to serve until the 2018 annual meeting of stockholders and until his successor is duly elected and qualified or until his earlier death, resignation or removal;
- To vote on a non-binding, advisory resolution approving the compensation of the Company's named executive officers;
- To ratify the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017; and
- To transact such other business as may properly come before the meeting and any adjournments or postponements thereof.

These matters are more fully described in the proxy statement accompanying this notice.

The Board of Directors has fixed the close of business on April 6, 2017 as the record date for the determination of stockholders entitled to notice of and to vote at the Annual Meeting or any adjournment thereof. Please see the attached proxy statement for information on how to obtain directions to attend the Annual Meeting and vote in person.

In order to ensure your representation at the Annual Meeting, you are requested to submit your vote as instructed in the Important Notice Regarding the Availability of Proxy Materials that you will receive in the mail. You may also request a paper proxy card at any time on or before May 18, 2017 to submit your vote by mail. If you attend the Annual Meeting and file with the Secretary of the Company an instrument revoking your proxy or a duly executed proxy bearing a later date, your proxy will not be used.

**Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting to be held on
Thursday, June 1, 2017 at 9:00 a.m. (EDT) at Assembly's offices located at
11711 N. Meridian Street, Suite 310, Carmel, IN 46032.**

The Proxy Statement and the annual report to stockholders on Form 10-K are available at: www.proxyvote.com.

[TABLE OF CONTENTS](#)

We hope that you will attend the meeting in person on June 1, 2017, and we very much appreciate your continuing interest in Assembly.

By Order of the Board of Directors,



Derek A. Small
President and Chief Executive Officer

April 21, 2017

You are cordially invited to attend the meeting in person. Whether or not you expect to attend the meeting, please complete, date, sign and return the proxy card mailed to you, or vote over the telephone or the Internet as instructed in the Important Notice Regarding the Availability of Proxy Materials that you will receive in the mail, or vote by mail by requesting a printed copy of the proxy card, as promptly as possible in order to ensure your representation at the meeting. Even if you have voted by proxy, you may still vote in person if you attend the meeting. Please note, however, that if your shares are held of record by a broker, bank or other nominee and you wish to vote at the meeting, you must obtain a proxy issued in your name from that record holder.



assembly
biosciences

ASSEMBLY BIOSCIENCES, INC.
11711 N. Meridian Street, Suite 310
Carmel, IN 46032

**PROXY STATEMENT
FOR THE 2017 ANNUAL MEETING OF STOCKHOLDERS**

JUNE 1, 2017

INFORMATION CONCERNING SOLICITATION AND VOTING

The Board of Directors (the Board) of Assembly Biosciences, Inc., a Delaware corporation (we, us, Assembly or the Company) is soliciting your proxy to vote at the 2017 Annual Meeting of Stockholders (the Annual Meeting) to be held at our offices at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 46032, at 9:00 a.m. (EDT) on Thursday, June 1, 2017, including any adjournments or postponements of the meeting. You are invited to attend the Annual Meeting to vote on the proposals described in this proxy statement. However, you do not need to attend the meeting to vote your shares. Instead, you may follow the instructions in the Proxy Availability Notice described below to submit your proxy over the telephone or through the Internet, or you may vote by mail by using the proxy card provided or requesting a printed copy of the proxy card.

We mailed an Important Notice Regarding the Availability of Proxy Materials (the Proxy Availability Notice) on or about April 21, 2017 to our stockholders of record and beneficial owners as of April 6, 2017, the record date for the meeting. The proxy materials, including this proxy statement, proxy card or voting instruction card and our 2016 Annual Report on Form 10-K are being distributed and made available on or about April 21, 2017. This proxy statement contains important information for you to consider when deciding how to vote on the matters brought before the Annual Meeting. Please read it carefully.

This proxy statement and the Proxy Availability Notice contain instructions for accessing and reviewing our proxy materials on the Internet and for voting by proxy over the Internet, by phone or by mail. The Proxy Availability Notice and the proxy card will also provide instructions on how you can elect to receive future proxy materials electronically or in printed form by mail. If you choose to receive future proxy materials electronically, you will receive an email next year with instructions containing a link to the proxy materials and a link to the proxy voting site. Your election to receive proxy materials electronically or in printed form by mail will remain in effect until you terminate such election. You will need to obtain your own Internet access if you choose to access the proxy materials and/or vote over the Internet. If you prefer to receive printed copies of our proxy materials, the Proxy Availability Notice contains instructions on how to request the materials by mail. For stockholders who have elected to receive proxy materials electronically, you will not receive printed copies of the proxy materials unless you request them. If you elect to receive the materials by mail, you may also vote by proxy on the proxy card or voter instruction card that you will receive in response to your request.

Choosing to receive future proxy materials electronically will allow us to provide you with the information you need more rapidly, will save us the cost of printing and mailing documents to you and will conserve natural resources.

[TABLE OF CONTENTS](#)

Delivery of Documents to Stockholders Sharing an Address

The Securities and Exchange Commission (SEC) has adopted rules that permit companies to deliver a single Proxy Availability Notice or a single copy of proxy materials to multiple stockholders sharing an address unless a company has received contrary instructions from one or more of the stockholders at that address. Upon request, we will promptly deliver a separate Proxy Availability Notice or separate copy of proxy materials to one or more stockholders at a shared address to which a single Proxy Availability Notice or a single copy of proxy materials was delivered. Stockholders may request a separate Proxy Availability Notice or separate copy of proxy materials by contacting our Corporate Secretary either by calling 1-855-971-4467 or by mailing a request to 11711 N. Meridian Street, Suite 310, Carmel, IN 46032. Stockholders at a shared address who receive multiple Proxy Availability Notices or multiple copies of proxy materials may request to receive a single Proxy Availability Notice or a single copy of proxy materials in the future in the same manner as described above.

QUESTIONS AND ANSWERS ABOUT THESE PROXY MATERIALS AND VOTING

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

In accordance with the rules and regulations adopted by the U.S. Securities and Exchange Commission, or SEC, we have elected to provide access to our proxy materials over the Internet instead of mailing a printed copy of our proxy materials to each stockholder. Accordingly, we intend to mail an Important Notice Regarding Availability of Proxy Materials (the Proxy Availability Notice) on or about April 21, 2017 to most stockholders of record entitled to vote at the Annual Meeting. Stockholders will have the ability to access the proxy materials on a website referred to in the Proxy Availability Notice commencing on or about April 21, 2017 or request a printed set of the proxy materials be sent to them by following the instructions in the Proxy Availability Notice.

Why did I receive a full set of proxy materials and the Important Notice Regarding the Availability of Proxy Materials?

We are providing paper copies of the proxy materials to stockholders who have previously requested to receive them in paper form or for whom an election to receive proxy materials electronically via email or the Internet are not on file in writing. If you would like to reduce the environmental impact and the costs incurred by us in mailing proxy materials, you may elect to receive all future proxy materials electronically via email or the Internet. To sign up for electronic delivery, please follow the instructions provided with your proxy materials and on your proxy card or voting instruction card, to vote using the Internet and, when prompted, indicate that you agree to receive or access future stockholder communications electronically. Alternatively, you can go to www.proxyvote.com and enroll for online delivery of Annual Meeting and proxy voting materials.

What does it mean if I receive more than one Proxy Availability Notice?

If you receive more than one Proxy Availability Notice, your shares may be registered in more than one name or in different accounts. Please follow the voting instructions on each Proxy Availability Notice to ensure that all of your shares are voted. All of your shares may be voted at www.proxyvote.com regardless of which account they are registered or held in.

How do I attend the Annual Meeting?

Admission to the meeting will be limited to our stockholders of record, persons holding proxies from our stockholders of record and beneficial owners of our common stock. If you wish to attend and vote at the Annual Meeting, you must bring: (1) valid photo identification, such as a driver's license or passport; and (2) evidence of stock ownership as of the Record Date, such as an account statement, proxy card or voting information form. If your shares are held through a broker, bank or other nominee, you must bring proof of your ownership of the shares. This could consist of, for example, a bank or brokerage firm account statement or a letter from your bank or broker confirming your ownership as of the record date. Cameras, recording devices, and other electronic devices will not be permitted at the Annual Meeting. For directions to the Annual Meeting, please contact Elizabeth H. Lacy at elizabeth@assemblybio.com or 1-855-971-4467.

Who can vote at the Annual Meeting?

Only stockholders of record at the close of business on April 6, 2017 (the Record Date), will be entitled to vote at the Annual Meeting. On the Record Date, there were 17,305,044 shares of common stock outstanding and entitled to vote.

Stockholder of Record: Shares Registered in Your Name

If on April 6, 2017 your shares were registered directly in your name with Assembly's transfer agent, VStock Transfer, LLC, then you are a stockholder of record. As a stockholder of record, you may vote in person at the meeting or vote by proxy. Whether or not you plan to attend the meeting, we urge you to fill out and return your proxy card or vote by proxy over the telephone or Internet as instructed below to ensure your vote is counted.

TABLE OF CONTENTS

Beneficial Owner: Shares Registered in the Name of a Broker or Bank

If on April 6, 2017 your shares were held, not in your name, but rather in an account at a brokerage firm, bank, dealer or other similar organization, then you are the beneficial owner of shares held in “street name” and the Proxy Availability Notice is being forwarded to you by that organization. The organization holding your account is considered to be the stockholder of record for purposes of voting at the Annual Meeting. As a beneficial owner, you have the right to direct your broker or other agent regarding how to vote the shares in your account. You are also invited to attend the Annual Meeting. However, since you are not the stockholder of record, you may not vote your shares in person at the meeting unless you request and obtain a valid proxy from your broker or other agent.

What am I voting on?

There are three matters scheduled for a vote:

1. Election of seven directors;
2. Non-binding, advisory resolution approving the compensation of the Company’s named executive officers, as disclosed in this proxy statement in accordance with SEC rules; and
3. Ratification of the selection by the Audit Committee of the Board of Ernst & Young LLP as the Company’s independent registered public accounting firm for the Company’s fiscal year ending December 31, 2017.

What if another matter is properly brought before the meeting?

The Board knows of no other matters that will be presented for consideration at the Annual Meeting. If any other matters are properly brought before the meeting, it is the intention of the persons named in the accompanying proxy to vote on those matters in accordance with their best judgment.

How do I vote?

You may either vote “For” our nominees to the Board or you may “Withhold” your vote for the nominees. For each of the other matters to be voted on, you may vote “For” or “Against” or abstain from voting.

The procedures for voting depend upon whether your shares are registered in your name or are held by a bank, broker or other nominee:

Stockholder of Record: Shares Registered in Your Name

If you are a stockholder of record, you may vote in person at the Annual Meeting, vote by proxy using a proxy card that we have provided or that you may request or that we may elect to deliver at a later time, vote by proxy over the telephone or vote by proxy through the Internet. Whether or not you plan to attend the meeting, we urge you to vote by proxy to ensure your vote is counted. You may still attend the meeting and vote in person even if you have already voted by proxy.

- To vote in person, come to the Annual Meeting and we will give you a ballot when you arrive.
- To vote using a proxy card, simply complete, sign and date the proxy card and return it pursuant to the instructions provided. Your vote must be received by May 31, 2017 to be counted.
- To vote over the telephone, dial toll-free 1-800-690-6903 using a touch-tone phone and follow the recorded instructions. You will be asked to provide the company control number from the proxy card or Proxy Availability Notice. Your vote must be received by 11:59 p.m. EDT on May 31, 2017 to be counted.
- To vote through the Internet, go to www.proxyvote.com to complete an electronic proxy card. You will be asked to provide the company control number from the proxy card. Your vote must be received by 11:59 p.m. EDT on May 31, 2017 to be counted.

TABLE OF CONTENTS

Beneficial Owner: Shares Registered in the Name of Broker or Bank

If you are a beneficial owner of shares registered in the name of your broker, bank, or other nominee, you should have received a Proxy Availability Notice containing a voting instruction form from that organization rather than from Assembly. Simply complete and mail the voting instruction form provided with the Proxy Availability Notice to ensure that your vote is counted. To vote in person at the Annual Meeting, you must obtain a valid proxy from your broker, bank or other nominee.

- To vote in person at the Annual Meeting, contact your broker, bank or other nominee to obtain a valid proxy from that institution.
- To vote using the voting instruction form accompanying the Proxy Availability Notice, simply complete, sign and date the voting instruction form and return it pursuant to the instructions provided. Your vote must be received by May 31, 2017 to be counted.
- To vote over the telephone, dial toll-free 1-800-690-6903 using a touch-tone phone and follow the recorded instructions. You will be asked to provide the company number and control number from the voting instruction form or Proxy Availability Notice. Your vote must be received by 11:59 p.m. EDT on May 31, 2017 to be counted.
- To vote through the Internet, go to www.proxyvote.com to complete an electronic proxy. You will be asked to provide the company control number from the voting instruction form. Your vote must be received by 11:59 p.m. EDT on May 31, 2017 to be counted.

Internet proxy voting is provided to allow you to vote your shares online, with procedures designed to ensure the authenticity and correctness of your proxy vote instructions. However, please be aware that you must bear any costs associated with your Internet access, such as usage charges from Internet access providers and telephone companies.

How many votes do I have?

On each matter to be voted upon, you have one vote for each share of common stock you own as of April 6, 2017.

Who is paying for this proxy solicitation?

We will pay for the entire cost of soliciting proxies. In addition to these proxy materials, our directors and employees may also solicit proxies in person, by telephone or by other means of communication. Directors and employees will not be paid any additional compensation for soliciting proxies. We may also reimburse brokerage firms, banks and other nominees for their reasonable out-of-pocket expenses for forwarding proxy materials to beneficial owners and seeking instruction with respect thereto.

Can I vote my shares by filling out and returning the Proxy Availability Notice?

No. The Proxy Availability Notice will, however, provide instructions on how to vote by Internet, telephone, mail (by requesting a paper proxy card or voting instruction card), and in person at the meeting.

If you receive a proxy statement and a paper proxy card together with the Proxy Availability Notice, the paper proxy card may be used to vote your shares.

Can I change my vote or revoke my proxy after submitting my proxy?

Stockholder of Record: Shares Registered in Your Name

Yes. You can change your vote or revoke your proxy at any time before the deadline to vote. If you are the record holder of your shares, you may change your vote or revoke your proxy in any one of the following ways:

- You may submit another properly completed proxy card with a later date.
- You may grant a subsequent proxy by telephone or through the Internet.

TABLE OF CONTENTS

- You may send a timely written notice that you are revoking your proxy to Elizabeth H. Lacy, our Corporate Secretary, at 11711 N. Meridian Street, Suite 310, Carmel, IN 46032.
- You may attend the Annual Meeting and vote in person. Simply attending the meeting will not, by itself, revoke your proxy.

Your most current vote (prior to the deadline) by proxy card or telephone or Internet proxy is the one that is counted.

Beneficial Owner: Shares Registered in the Name of Broker, Bank

Yes. You can change your vote or revoke your voting instruction form at any time before the deadline to vote. If your shares are held by your broker or bank as a nominee or agent, you should follow the instructions provided by your broker, bank or other nominee. Note however, you may also revoke your proxy in any one of the following ways:

- You may grant a subsequent voting instruction by telephone or through the Internet.
- You may attend the Annual Meeting and vote in person provided you request and obtain a valid proxy from your broker, bank or other nominee. Simply attending the meeting will not, by itself, revoke your voting instruction form.

Your most current vote (prior to the deadline) by voting instruction form or telephone or Internet proxy is the one that is counted.

When are stockholder proposals due for next year's annual meeting?

Any stockholder who meets the requirements of the proxy rules under the Securities Exchange Act of 1934, as amended (the Exchange Act) may submit proposals to the Board to be included in next year's proxy statement and on the Company's proxy card for the 2018 Annual Meeting. Such proposals must comply with the requirements of Rule 14a-8 under the Exchange Act. To be considered for inclusion in next year's proxy materials, your proposal must be submitted in writing by December 22, 2017, to our Corporate Secretary at 11711 N. Meridian Street, Suite 310, Carmel, IN 46032; provided, however, that if our 2018 Annual Meeting of Stockholders is held before May 2, 2018 or after July 1, 2018, then the deadline is a reasonable amount of time prior to the date we begin to print and mail our proxy statement for the 2018 Annual Meeting of Stockholders.

Subject to compliance with applicable requirements of state law and the Exchange Act, our amended and restated bylaws also provide for separate notice procedures to propose business to be considered by stockholders at a meeting, provided that such proposal would not be included in next year's proxy materials. Such proposals must comply with the requirements, including without limitation, the separate notice procedures, of our amended and restated bylaws. If you wish to submit such a proposal, written notice must be received by the Secretary no later than the close of business not more than 90 days before or less than 60 days before the date of the meeting, in the case of the 2018 Annual Meeting or any other annual meeting, or by the 10th business day following the day on which public announcement of the date of the meeting is first made, in the case of a special meeting.

Our amended and restated bylaws also provide for separate notice procedures to recommend a person for nomination as a director. Such proposals must comply with the requirements, including without limitation, the separate notice procedures, of our amended and restated bylaws. If you wish to nominate a director, written notice must be received by the Secretary no later than the close of business not more than 90 days before or less than 60 days before the date of the meeting, in the case of the 2018 Annual Meeting or any other annual meeting, or not later than the 10th business day following the day on which public announcement of the date of the meeting is first made, in the case of a special meeting.

How are votes counted?

Votes will be counted by the inspector of election appointed for the meeting, who will separately count, for the proposal to elect directors, votes "For," "Withhold" and broker non-votes; and, with respect to other proposals, votes "For" and "Against," abstentions and, if applicable, broker non-votes. "Withheld" votes will have no effect and will not be counted towards the election of directors. With respect to other proposals,

TABLE OF CONTENTS

abstentions will be counted towards the vote total for each proposal, and will have the same effect as “Against” votes. Broker non-votes have no effect and will not be counted towards the vote total for any proposal, but will be counted for the purpose of determining whether a quorum is present at the Annual Meeting.

What are “broker non-votes”?

Broker non-votes occur when a beneficial owner of shares held in “street name” does not give voting instructions to the broker, bank or other nominee holding the shares as to how to vote on matters deemed “non-routine.” Generally, if shares are held in street name, the beneficial owner of the shares is entitled to give voting instructions to the broker, bank or other nominee holding the shares. If the beneficial owner does not provide voting instructions, the broker, bank or other nominee can still vote the shares with respect to matters that are considered to be “routine,” but not with respect to “non-routine” matters. Under the rules and interpretations of NASDAQ, “non-routine” matters are matters that may substantially affect the rights or privileges of stockholders, such as mergers, stockholder proposals, elections of directors (even if not contested) and executive compensation, including the advisory stockholder votes on executive compensation and on the frequency of stockholder votes on executive compensation. Accordingly, the “non-routine” matters on the agenda for the Annual Meeting include Proposal No. 1 — Election of Directors and Proposal No. 2 — Non-Binding, Advisory Vote on Named Executive Officer Compensation.

Broker non-votes will be counted for the purpose of determining whether a quorum is present at the Annual Meeting. However, because broker non-votes are not considered under Delaware law to be entitled to vote at the Annual Meeting, they will have no effect on the outcome of the vote on Proposal No. 1 — Election of Directors or Proposal No. 2 — Non-Binding, Advisory Resolution Approving Compensation of the Company’s Named Executive Officers. As a result, if you hold your shares in street name and you do not instruct your broker, bank or other nominee how to vote your shares in the election of directors or the advisory vote related to the approval of named executive officers’ compensation, no votes will be cast on your behalf on these proposals. Therefore, it is critical that you indicate your vote on these proposals if you want your vote to be counted.

What if I return a proxy card or otherwise vote but do not make specific choices?

If you return a signed and dated proxy card or otherwise vote without marking voting selections, your shares will be voted:

- (1) FOR the election of the seven director nominees identified in this proxy statement;
- (2) FOR the approval of a non-binding, advisory resolution approving the compensation of the Company’s named executive officers;
- (3) FOR ratification of the selection of Ernst & Young LLP as the Company’s registered independent public accounting firm for the Company’s fiscal year ending December 31, 2017; and
- (4) To transact such other business as may properly come before the Annual Meeting and any adjournments or postponements thereof as determined in the discretion of your proxyholder.

What is the quorum requirement?

A quorum of stockholders is necessary to hold a valid meeting. A quorum will be present if stockholders holding at least a majority of the outstanding shares entitled to vote as of the record date are present at the meeting in person or represented by proxy. On the record date, there were 17,305,044 shares of common stock outstanding and entitled to vote. Thus, the holders of 8,652,523 shares must be present in person or represented by proxy at the meeting to have a quorum.

Your shares will be counted towards the quorum only if you submit a valid proxy (or one is submitted on your behalf by your broker, bank or other nominee) by May 31, 2017 or if you vote in person at the meeting. Abstentions and broker non-votes will be counted towards the quorum requirement. If there is no quorum, the holders of a majority of shares present at the meeting in person or represented by proxy may adjourn the meeting to another date.

[TABLE OF CONTENTS](#)

Once a share is represented for any purpose at the Annual Meeting, it is deemed present for quorum purposes for the remainder of the meeting and any adjournment thereof unless a new record date is set for the adjournment.

How many votes are needed to approve each proposal?

Assuming the presence of a quorum at the Annual Meeting, the following sets forth the votes necessary for each of the proposals being submitted to the stockholders:

<u>Proposal</u>	<u>Description</u>	<u>Vote Required</u>	<u>Discretionary Voting Allowed</u>
No. 1	Election of Seven Directors	Plurality	No
No. 2	Non-Binding, Advisory Resolution Approving the Compensation of the Company's Named Executive Officers	Majority Present & Entitled to Vote	No
No. 3	Ratification of the Selection of Ernst & Young LLP as Independent Registered Public Accounting Firm for the Company for its Fiscal Year Ending December 31, 2017	Majority Present & Entitled to Vote	Yes

The election of directors will be determined by a plurality of the votes cast at the Annual Meeting. This means that the seven nominees receiving the highest number of "FOR" votes will be elected as directors. Withheld votes and broker non-votes, if any, are not treated as votes cast, and therefore will have no effect on the proposal to elect directors.

With regard to the vote on the non-binding, advisory resolution approving the compensation of the Company's named executive officers and the ratification of the selection of Ernst & Young as our independent registered public accounting firm, a "Majority Present & Entitled to Vote" standard means the affirmative vote of the holders of a majority of the shares of common stock present in person or represented by proxy at the Annual Meeting and entitled to vote on such matter is required for the proposal to pass. For purposes of determining whether the proposal has passed, abstentions will be treated as votes cast against the proposal, but broker non-votes will have no impact on the outcome of the proposal.

Accordingly, assuming a quorum is present:

- Proposal No. 1: For the election of directors, the seven nominees receiving the highest number of "FOR" votes from the holders of shares present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 1 will be elected. Only votes "FOR" will affect the outcome. "WITHHELD" votes and broker non-votes will have no effect on the outcome of the election of directors.
- Proposal No. 2: To be approved, a majority of the shares of common stock held by holders present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 2 must be voted "FOR" the non-binding, advisory resolution to approve the compensation of Assembly's named executive officers. Abstentions will be deemed a vote against Proposal No. 2. Broker non-votes will not be considered towards vote totals on Proposal No. 2 and will have no effect on the outcome of the vote.
- Proposal No. 3: To be approved, a majority of the shares of common stock held by holders present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 3 must be voted "FOR" the ratification of the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017. Abstentions will be deemed a vote against Proposal No. 3. Broker non-votes will not be considered towards vote totals on Proposal No. 3; however, the ratification of the appointment of Ernst & Young LLP is a matter on which a broker, bank or other nominee has discretionary voting authority, and thus, we do not expect any broker non-votes with respect to Proposal No. 3.

[TABLE OF CONTENTS](#)

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

Preliminary voting results will be announced at the Annual Meeting. In addition, final voting results will be reported in a Current Report on Form 8-K that we expect to file within four business days after the Annual Meeting. If final voting results are not available to us in time to file a Form 8-K within four business days after the meeting, we intend to file a Form 8-K to report preliminary results and, within four business days after the final results are known to us, file an additional Form 8-K to report the final results.

What proxy materials are available on the Internet?

The proxy statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2016 are available free of charge at www.proxyvote.com. You can request a copy of our Annual Report on Form 10-K free of charge by calling 1-855-971-4467 or sending an e-mail to elizabeth@assemblybio.com. Please include your contact information with the request.

Our Annual Report on Form 10-K for the fiscal year ended December 31, 2016 as filed with the SEC, is accessible free of charge on our website. It contains audited financial statements covering our fiscal years ended December 31, 2016, 2015 and 2014. The Annual Report on Form 10-K, without exhibits, is included in the 2016 Annual Report to Stockholders that is available with this proxy statement.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This proxy statement contains forward-looking statements. These statements relate to future events or our future financial performance and involve known and unknown risks, uncertainties and other factors that could cause our actual results, levels of activity, performance or achievement to differ materially from those expressed or implied by these forward-looking statements.

Forward-looking statements include all statements that are not historical facts. In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “could,” “would,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “projects,” “predicts,” “potential,” or the negative of those terms, and similar expressions and comparable terminology intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties, including those outlined in our Annual Report on Form 10-K for the year ended December 31, 2016. Given these uncertainties, you should not place undue reliance on these forward-looking statements. These forward-looking statements represent our estimates and assumptions only as of the date of this proxy statement and, except as required by law, we undertake no obligation to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise after the date of this proxy statement.

PROPOSAL NO. 1 — ELECTION OF DIRECTORS

Our bylaws provide that the number of our directors is to be within a range of three to nine, with the exact number set by the Board. Our Board has set the number of directors at seven. In the future, the Board might decide to increase the number of directors, within the range, if suitable candidates with desired experience and expertise are found.

Our Board currently consists of seven directors. There are seven nominees for election to the Board this year. Each director to be elected and qualified will hold office until the next annual meeting of the stockholders and until his successor is duly elected and qualified, or, if sooner, until the director's death, resignation or removal. Each of the nominees listed below is currently a director of the Company. Each of the director nominees was previously elected by the stockholders. Directors are elected by a plurality of the votes of the holders of shares present in person or represented by proxy and entitled to vote on the election of directors. The seven nominees receiving the highest number of affirmative votes will be elected.

Nominees for Director

The Nominating and Governance Committee has recommended, and the Board has approved, the nomination of each of Anthony E. Altig, Mark Auerbach, Richard DiMarchi, Ph.D., Myron Z. Holubiak, Alan J. Lewis, Ph.D., William R. Ringo, Jr. and Derek A. Small as a director of Assembly. The Board has determined that all of these directors, with the exception of Mr. Small, are independent as determined in accordance with the rules of the NASDAQ Stock Market and the SEC. There are no family relationships among any of our directors or executive officers. The respective names, ages, lengths of service with Assembly and brief biographical summaries of our nominees for director are as follows:

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
Anthony E. Altig	61	2012	Mr. Altig joined our Board in January 2012. Since 2008, Mr. Altig has been the Chief Financial Officer of Biotix Holdings, Inc., a company that manufactures microbiological consumables. From 2004 to 2007, Mr. Altig served as the Chief Financial Officer of Diversa Corporation (subsequently Verenum Corporation), a public company developing specialized industrial enzymes. Prior to joining Diversa, Mr. Altig served as the Chief Financial Officer of Maxim Pharmaceuticals, Inc., a public biopharmaceutical company. In addition, Mr. Altig serves as a director and chairman of the audit committee for TearLab Corporation (formerly OccuLogix, Inc.), a publicly traded eyecare technology company. He formerly served as a director of MultiCell Technologies, Inc. and Optimer Pharmaceuticals, Inc., a pharmaceutical company, which was a public company until its acquisition by Cubist Pharmaceuticals, Inc. in October 2013. Mr. Altig received his BBA in business from the University of Hawaii at Manoa and is a Certified Public Accountant (inactive). Among other experience, qualifications, attributes and skills, Mr. Altig's extensive management experience and financial expertise, as well as his experience serving on the boards of directors of several public pharmaceutical and healthcare companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
Mark Auerbach	78	2010	<p>Mr. Auerbach was elected to our Board in November 2010. From April 2013 until June 2016, Mr. Auerbach was the chairman of the audit committee of RCS Capital Corporation (NYSE: RCAP), a publicly traded financial services company. From December 2014 until June 2016, Mr. Auerbach was non-executive chairman of the board of RCS Capital Corporation. Mr. Auerbach previously served as lead independent director and chairman of the audit committee of Optimer Pharmaceuticals, Inc., a public company, from 2005 until its acquisition by Cubist Pharmaceuticals, Inc. in October 2013. From January 2006 through March 2010, Mr. Auerbach served as the chairman of the board of directors for Neuro Hitech, Inc., an early stage pharmaceutical company specializing in brain degenerative diseases. Over the last 20 years, Mr. Auerbach also has served as a director for several other companies, including Par Pharmaceutical Companies, Inc., a publicly traded manufacturer and marketer of generic pharmaceuticals and the parent of Par Pharmaceutical, Inc. From 1993 to 2005, Mr. Auerbach served as chief financial officer of Central Lewmar LLC, a national fine paper distributor. Mr. Auerbach received his B.S. degree in accounting from Rider University. Among other experience, qualifications, attributes and skills, Mr. Auerbach's extensive financial experience, his accounting degree and his experience as a director of several public companies, including his service as the chair of the audit committee of one of those public companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.</p>

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
Richard DiMarchi, Ph.D.	64	2014	<p>Dr. DiMarchi became a director upon the closing of the Assembly Pharmaceuticals, Inc. acquisition in July 2014 through its merger with a wholly owned subsidiary of Assembly (the Merger). Dr. DiMarchi is a co-founder of Assembly Pharmaceuticals, Inc. and served on its board since inception in 2012. Dr. DiMarchi is currently a Cox Distinguished Professor of Biochemistry and Gill Chair in Biomolecular Sciences at Indiana University and serves as Vice President of Research at Novo Nordisk Research Labs. Dr. DiMarchi was a co-founder and board member of biotechnology companies Ambrx, Inc. and Marcadia Biotech Inc., a founder of Calibrium LLC, and advisor to Twilight Ventures. Dr. DiMarchi retired as Group Vice President at Eli Lilly & Company, where he provided leadership for more than two decades in biotechnology, endocrine research, and product development. Dr. DiMarchi previously served as a board member of the biotechnology trade group BIO, Isis Pharmaceuticals, Inc. and Millennium BioTherapeutics, Inc. His current research is focused on developing macromolecules with enhanced therapeutic properties through biochemical and chemical optimization, an approach he has termed chemical biotechnology. Dr. DiMarchi contributed significantly to the discovery of Humalog® and to the commercial development of pharmaceutical products Humulin®, Humatrope®, Glucagon®, Xigris®, Forteo®, and Evista®. Dr. DiMarchi is the recipient of numerous prestigious awards and in 2014 was inducted to the National Inventors Hall of Fame and in 2015 to the National Academy of Medicine. Dr. DiMarchi received his Ph.D. in Biochemistry from Indiana University, and completed his postdoctoral studies at the Rockefeller University. Among other experience, qualifications, attributes and skills, Dr. DiMarchi's scientific training, extensive experience in the pharmaceutical industry, as well as his experience serving on the board of directors of several private pharmaceutical companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.</p>

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
Myron Z. Holubiak	70	2010	<p>Mr. Holubiak joined our Board in July 2010. Mr. Holubiak currently serves as President, chief executive officer and a director of Citius Pharmaceuticals, Inc. (OTCB:CTXR), a late stage drug development company focused on critical care drug products. Mr. Holubiak's former company, Leonard-Meron Biosciences, Inc., merged with Citius Pharmaceuticals, Inc. in March 2016. Mr. Holubiak is the former President of Roche Laboratories, Inc., USA, a major research-based pharmaceutical company, a position he held from December 1998 to August 2001. Prior to that, he held many sales and marketing positions at Roche Laboratories during his 19 year tenure there. From September 2002 until June 2016, Mr. Holubiak served on the board of directors of BioScrip, Inc., a publicly traded company and a leading home infusion provider with nationwide pharmacy and nursing capabilities and was chairman of the board of Bioscrip, Inc. from April 2012 until June 2016. Mr. Holubiak is a director of 1-800-DOCTORS, Inc., a private physician finder company; he was president of 1-800-DOCTORS from May 2007 to January 2014. Since July 2015, Mr. Holubiak also has been a member of the board of directors of bioAffinity Technologies, Inc., a cancer screening and diagnostics company. From October 2012 until July 2014, Mr. Holubiak served as a director of Intellicell Biosciences, Inc., a publicly traded regenerative medicine company. Mr. Holubiak is also a trustee of the Academy of Managed Care Pharmacy Foundation. Mr. Holubiak received his B.S. in Molecular Biology and Biophysics from the University of Pittsburgh. Mr. Holubiak has received advanced business training from the Harvard Business School, the London School of Economics and the Centre for Health Economics at the University of York. Among other experience, qualifications, attributes and skills, Mr. Holubiak's extensive experience managing pharmaceutical and healthcare companies led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.</p>

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
Alan J. Lewis, Ph.D.	71	2015	<p>Dr. Lewis joined our Board in December 2015. Since March 2015, Dr. Lewis has served as Chief Executive Officer and director of DiaVacs, Inc., a biotechnology company that offers dendritic cell therapy for autoimmunity and juvenile diabetes. From October 2012 to March 2014, Dr. Lewis was Chief Executive Officer and a director of Medistem, Inc., a publicly traded biotechnology company, and developer of stem cell therapies that was acquired by Intrexon Corporation. From July 2010 until November 2011, Dr. Lewis was Chairman, President and Chief Executive Officer of cancer drug developer Ambit Biosciences, Inc., which was subsequently acquired by Daiichi Sankyo Company, Limited. From January 2009 until June 2010, Dr. Lewis was President and Chief Executive Officer of the Juvenile Diabetes Research Foundation. From February 2006 until December 2008, Dr. Lewis was President and Chief Executive Officer of stem cell company Novocell, Inc., a privately held regenerative disease biotechnology company. Prior to that, Dr. Lewis served as Chief Executive Officer and a director of Signal Pharmaceuticals until its acquisition by Celgene Corporation. Dr. Lewis was named President of Celgene's Signal Research division in San Diego, where he directed its integrated drug discovery program in oncology and inflammation and served on Celgene's corporate executive committee. Dr. Lewis is on the board of directors for BioMarin Pharmaceuticals, Inc., where he chairs the science and technology committee and Scancell Holdings Plc, where he serves on the audit committee and remuneration committee. Dr. Lewis holds a B.Sc. in Physiology and Biochemistry from Southampton University and a Ph.D. in Pharmacology from the University of Wales, and he completed his postdoctoral training at Yale University. Among other experience, qualifications, attributes and skills, Dr. Lewis' extensive experience in management and the operation of pharmaceutical and healthcare companies and his scientific background, together with his experience serving on the board of directors of a public company and several private biotechnology companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.</p>

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Director Since</u>	<u>Business Experience For Last Five Years</u>
William R. Ringo, Jr.	71	2014	<p>Mr. Ringo became a director upon the closing of the Merger in July 2014, and became non-executive Chairman of the Board in February 2015. From July 2010 until December 2015, Mr. Ringo was a senior advisor with Barclays Capital, the global investment banking division of Barclays Bank PLC. From July 2010 until December 2015, Mr. Ringo served as a strategic advisor with Sofinnova Ventures, a life sciences focused investment firm. Prior to his advisory roles with Barclays Capital and Sofinnova Ventures, Mr. Ringo served as senior Vice President of Strategy and Business Development for Pfizer Inc., a biopharmaceutical company, from April 2008 until his retirement in April 2010. From 2004 to 2006, Mr. Ringo served as President and Chief Executive Officer of Abgenix, Inc., a privately held biotechnology company acquired by Amgen, Inc. Mr. Ringo served on the Onyx Pharmaceuticals, Inc. board of directors from February 2011 until the October 2013 acquisition by Amgen, Inc. From 2001 to 2007, he served on various boards of directors, including Encysive Pharmaceuticals, Inc., Inspire Pharmaceuticals, Inc. and InterMune, Inc. where he was the non-executive chairman of the board of directors after serving as interim Chief Executive Officer from June 2003 to September 2003. From 1994 to 2002, he served as a director and chairman of the board for Community Health Systems, Inc. His experience in the global pharmaceutical sector also includes nearly 30 years with Eli Lilly and Company (Lilly). Over the course of his career with Lilly, Mr. Ringo served in numerous executive roles, including Product Group President for oncology and critical care, President of internal medicine products, President of the infectious diseases business unit, and Vice President of sales and marketing for U.S. pharmaceuticals. He also was a member of Lilly's operating committee. Mr. Ringo is a director of Sangamo BioSciences, Inc., Immune Design Corp., Dermira, Inc. and Five Prime Therapeutics, Inc. Mr. Ringo received a B.S. in business administration and an M.B.A. from the University of Dayton. Among other experience, qualifications, attributes and skills, Mr. Ringo's extensive management experience in the pharmaceutical industry and experience in the capital markets, as well as his experience serving on the board of directors of a public pharmaceutical company and on the boards of directors of several private pharmaceutical companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.</p>

TABLE OF CONTENTS

Name	Age (as of 03/31/17)	Director Since	Business Experience For Last Five Years
Derek A. Small	41	2014	Mr. Small has served as our President and Chief Executive Officer since February 2015. Upon the closing of the Merger, Mr. Small joined us as a director and our President and Chief Operating Officer. Mr. Small co-founded Assembly Pharmaceuticals, Inc. and served as its Executive Chairman since its inception in 2012 and Chief Executive Officer beginning in January 2014. From March 2008 to January 2014, Mr. Small served as a founding director, President, and Chief Executive Officer of Naurex, Inc., a privately held biotechnology company developing novel therapies for central nervous system (CNS) disorders whose clinical assets were acquired by Allergan Pharmaceuticals International Limited in 2014. At Naurex, Mr. Small spearheaded the development of a rapidly acting novel antidepressant drug, Rapastinel, which has since been granted “breakthrough” designation from the FDA. Naurex’s preclinical programs formed the basis for a spinout CNS company, Aptinyx, Inc. From January 2009 to April 2012, Mr. Small also served as a founding director, President, and Chief Executive Officer of Coferon, Inc., a privately held biotechnology company, which is developing a novel self-assembling chemistry platform. Assembly Pharmaceuticals, Naurex/Aptinyx and Coferon are portfolio enterprises of Luson Bioventures, LLC, a biotechnology and biopharmaceutical venture creation firm that Mr. Small founded in 2007 and continues to head. Mr. Small received his B.S. in Business from Franklin College and studied global business at the Harlaxton College affiliate program in England. Among other experience, qualifications, attributes and skills, Mr. Small’s extensive management experience in the pharmaceutical industry, as well as his experience serving on the board of directors of several private pharmaceutical companies, led to the conclusion of our Board that he should serve as a director of the Company in light of our business and structure.

Required Vote

Assuming a quorum is present, the seven nominees receiving the highest number of “FOR” votes from the holders of shares present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 1 shall be elected as directors to serve until the 2018 Annual Meeting of Stockholders or until their successors have been duly elected and qualified. Only votes “FOR” will affect the outcome. “WITHHELD” votes and broker non-votes will have no effect on the outcome of the election of directors.

Recommendation of the Board of Directors

**THE BOARD OF DIRECTORS RECOMMENDS
A VOTE “FOR” THE ELECTION OF EACH NAMED NOMINEE FOR DIRECTOR**

INFORMATION REGARDING THE BOARD OF DIRECTORS AND CORPORATE GOVERNANCE

This section describes key corporate governance guidelines and practices that we have adopted. Complete copies of our charters of the committees of the Board and our Corporate Governance Policy, Code of Conduct and Code of Ethics described below may be found in the Investor Relations section of our website www.asssemblybio.com. Alternatively, you can request a copy of any of these documents free of charge by writing to Elizabeth H. Lacy, General Counsel, Vice President of Legal Operations and Corporate Secretary, c/o Assembly Biosciences, Inc. 11711 N. Meridian Street, Suite 310, Carmel, IN 46032. Information on our website is not incorporated by reference in this proxy statement.

Independence of Directors

Because our common stock is listed on the NASDAQ Stock Market, our Board applies the independence standards of the stock market rules of the NASDAQ Stock Market LLC to all of our directors. Using that test, the Board has determined that current directors Anthony E. Altig, Mark Auerbach, Richard DiMarchi, Ph.D., Myron Z. Holubiak, Alan J. Lewis, Ph.D., and William R. Ringo, Jr. are independent under the NASDAQ Marketplace Rules. Derek A. Small is not independent because he is our current President and Chief Executive Officer. As part of such determination of independence, our Board considered the relationships that each non-employee director has with us and all other facts and circumstances that the Board deemed relevant in determining independence, including the beneficial ownership of our capital stock by each non-employee director, and the association of certain of our directors with third parties, including Indiana University, with whom we have contractual relationships. After considering these factors, our Board has affirmatively determined that each of Mr. Altig, Mr. Auerbach, Dr. DiMarchi, Mr. Holubiak, Dr. Lewis and Mr. Ringo does not have a relationship with our company that would interfere with the exercise of independent judgment in carrying out his responsibilities as a director.

Board Leadership Structure

Our Board does not have a specific policy regarding the separation of the roles of the Chairman of the Board and the Chief Executive Officer and believes it is in the best interest of the Company and its stockholders to be able to exercise its discretion in combining or separating these positions as it deems appropriate in light of prevailing circumstances. Currently the roles are separated, with Mr. Ringo serving as independent Chairman. The Board believes that this structure best serves the interests of our stockholders because it allows our Chief Executive Officer to focus primarily on our business strategy and operations and most effectively leverages the experience of the Chairman. It also enhances the Board's independent oversight of our senior management team and enables better communications and relations between the Board, the Chief Executive Officer and other members of our senior management team. In that regard, our independent Chairman presides over the executive sessions of the non-management and independent directors of the Board. Our approach provides the flexibility for our Board to modify our leadership structure in the future as appropriate. We believe that we, like many U.S. companies, are well served by this flexible leadership structure.

Risk Oversight

The Board is actively involved in the oversight of risks that could affect us. This oversight is conducted primarily through committees of the Board, particularly the Audit Committee, but the full Board has retained responsibility for general oversight of risks. The Board satisfies this responsibility through regular reports by each committee chair regarding the committee's considerations and actions, as well as through regular reports directly from officers responsible for oversight of particular risks.

Compensation Risk Assessment

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

Board of Director Meetings

The business of our Company is under the general oversight of the Board as provided by the laws of Delaware and our bylaws. During the fiscal year ended December 31, 2016, the Board held eight meetings, the Audit Committee held seven meetings, the Compensation Committee held six meetings and also conducted business by written consent, the Nominating and Governance Committee held four meetings and the Science and Technology Committee held three meetings. Each person who was a director during 2016 attended 75% or more of the aggregate meetings of the Board and of the committees on which he served during the period for which he was a director or committee member. Applicable NASDAQ listing standards require that independent directors meet from time to time in executive session. In fiscal 2016, our independent directors met in regularly scheduled executive sessions at which only independent directors were present.

The Board adopted a formal policy that a Board meeting be held on the same date as the annual stockholders meeting and all directors of the Company are encouraged to attend our annual meetings of stockholders. All of our directors who had been nominated in 2016 attended last year's Annual Meeting.

INFORMATION REGARDING COMMITTEES OF THE BOARD OF DIRECTORS

The Board has a number of committees that perform certain functions for the Board. The current committees of the Board are the Audit Committee, the Compensation Committee, the Nominating and Governance Committee, and the Science and Technology Committee. Below is a description of each committee of the Board. Each of the committees has authority to engage legal counsel or other experts or consultants as it deems appropriate to carry out its responsibilities. The Board has determined that each member of each committee meets the applicable NASDAQ listing standards and relevant securities and other laws, rules and regulations regarding “independence” and that each member is free of any relationship that would impair his individual exercise of independent judgment with regard to our Company.

Audit Committee

The Board has a separately designated standing Audit Committee established in accordance with Section 3(a)(58)(A) of the Exchange Act. The Audit Committee was established by the Board to oversee and appraise our accounting and financial reporting processes, the audit process, our process for monitoring compliance with laws, regulations and our codes of conduct and ethics, and the quality and integrity of our financial statements and reports. In addition, the Audit Committee oversees the qualification, selection, independence and performance of our independent registered public accounting firm and recommends to the Board the appointment of our independent registered public accounting firm. Additionally, our Audit Committee is responsible for reviewing and approving all related person transactions, including transactions with executive officers and directors, for potential conflicts of interests or other improprieties.

The Audit Committee is governed by a written charter adopted by the Board, which was last amended on October 6, 2016. The Audit Committee charter can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. Information on our website is not incorporated by reference in this proxy statement. At the direction of the Nominating and Governance Committee, the Audit Committee will perform an annual performance evaluation of the Audit Committee and report to the Board on the results of such evaluation.

Our Audit Committee consists of Mr. Auerbach (Chair), Mr. Altig and Mr. Ringo. The Board annually reviews the NASDAQ Stock Market listing standards’ definition of independence for Audit Committee members and has determined that Messrs. Auerbach, Altig and Ringo are each independent (as independence is currently defined in NASDAQ Listing Rules 5605(c)(2)(A)(i) and (ii)). The Board has determined that each of Mr. Altig and Mr. Auerbach qualifies as an “audit committee financial expert” as that term is defined in Item 407(d) of Regulation S-K promulgated by the SEC. The Board made a qualitative assessment of Mr. Altig’s level of knowledge and experience based on a number of factors, including his experience as the Chief Financial Officer of several public companies and having been a certified public accountant. The Board made a qualitative assessment of Mr. Auerbach’s level of knowledge and experience based on a number of factors, including his extensive financial experience, his accounting degree and his experience as a director of several public companies, including his service as the chair of the audit committee of one of those public companies. In making that determination, the Board relied on the past business experience of Mr. Altig and Mr. Auerbach. Please see the description of the business experience for Mr. Altig and Mr. Auerbach under the heading “Nominees for Director.”

The Board has determined that all of the members of the Audit Committee are independent as defined in Nasdaq Stock Market Rule 5605(a)(2) and within the meaning of Rule 10A3(b)(1) of the Exchange Act.

Report of the Audit Committee of the Board of Directors¹

The Audit Committee reviews the Company’s financial reporting process on behalf of the Board. Management has the primary responsibility for the preparation and integrity of the consolidated financial statements and the reporting process, including establishing and monitoring the system of internal financial

¹ The material in this report is not deemed “soliciting material,” is not deemed “filed” with the SEC, is not subject to Regulation 14A or 14C or to the liabilities of Section 18 of the Exchange Act, and is not to be incorporated by reference into any filing of Assembly under the Securities Act of 1933, as amended (the Securities Act), or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

TABLE OF CONTENTS

controls. In this context, the Audit Committee has reviewed and discussed our consolidated audited financial statements for the year ended December 31, 2016 with management of the Company. The Audit Committee has discussed with Ernst & Young LLP, our independent registered public accounting firm, the matters required to be discussed by Auditing Standard No. 16, Communications with Audit Committee, as adopted by the Public Company Accounting Oversight Board, or PCAOB. The Audit Committee has also received the written disclosures and the letter from Ernst & Young LLP required by applicable requirements of the PCAOB regarding the independent accountants' communications with the Audit Committee concerning independence and has discussed with Ernst & Young LLP its independence. Based on the review and discussions described above, among other things, the Audit Committee has recommended to the Board that the consolidated audited financial statements be included in our Annual Report on Form 10-K for fiscal year ending December 31, 2016. The Audit Committee and the Board also have recommended the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the year ending December 31, 2017.

Submitted by: The Audit Committee
Mark Auerbach, Chairman
Anthony E. Altig
William R. Ringo, Jr.

Compensation Committee

The charter for our Compensation Committee requires the committee to have not less than three members. Our Compensation Committee currently consists of Mr. Holubiak (Chair), Mr. Auerbach and Mr. Ringo. Our Board has determined that Messrs. Holubiak, Auerbach and Ringo are each independent under The NASDAQ Stock Market listing standards, each is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act and each is an "outside director" as that term is defined in Section 162(m) of the Internal Revenue Code of 1986, as amended (Section 162(m)).

The purpose of our Compensation Committee is to discharge our Board's responsibilities relating to compensation of our directors, executive officers and employees and to administer our equity compensation and other benefit plans. In carrying out these responsibilities, our Compensation Committee reviews all components of executive officer compensation for consistency with our Compensation Committee's primary objectives of attracting and retaining key management personnel, driving long-term strategic values and enhancing stockholder value. The Compensation Committee charter specifies that the Compensation Committee will, among other things:

- review and approve the annual goals and objectives of the Company's principal executive officer and other executive officers;
- evaluate the executives' performance in light of approved goals and objectives;
- determine the compensation of the principal executive officer and other executive officers based on this evaluation;
- review and approve the compensation of other employees of the Company that the Committee may specify from time to time, and delegate authority to specified executive officer(s) to review and approve the compensation of other non-executive officer employees;
- review with the principal executive officer and any other appropriate officers the material criteria used by the principal executive officer and management in evaluating employee performance throughout the Company and in establishing appropriate compensation, retention, incentive, severance and benefit policies and programs;
- review the compensation of the Company's directors and recommend changes to the compensation of the Board;
- oversee the administration of, and periodically review and make changes to, the incentive compensation plans, equity-based compensation plans, and any material employee benefit, bonus, retirement, severance and other compensation plans of the Company;

TABLE OF CONTENTS

- prepare the Compensation Committee report required to be included in the Company's proxy statement or Annual Report on Form 10-K and recommend the inclusion of such report in the Company's proxy statement or Annual Report on Form 10-K;
- retain and approve the compensation of any compensation consultants; and
- evaluate the independence of any such compensation consultants.

Under the Compensation Committee charter, the Compensation Committee may, in its discretion, delegate its duties to a subcommittee consisting of one or more of its members. At the direction of the Nominating and Governance Committee, the Compensation Committee shall perform an annual performance evaluation and report to the Board on its results.

The Board has adopted a written charter for the Compensation Committee, which was last amended on October 6, 2016. The Compensation Committee charter can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. Information on our website is not incorporated by reference in this proxy statement.

Compensation Committee Interlocks and Insider Participation

Messrs. Holubiak, Auerbach and Ringo served as members of our Compensation Committee during the year ended December 31, 2016. No member of our Compensation Committee has ever been an executive officer or employee of us or any of our subsidiaries. None of our executive officers currently serves, or has served during the last completed fiscal year, on the compensation committee or board of directors of any other entity that has one or more executive officers serving as a member of the Board or Compensation Committee. During 2016, no members of our Compensation Committee had any relationships requiring disclosure by us under the SEC's rules requiring disclosure of certain relationships and related party transactions.

Compensation Committee Processes and Procedures

The implementation of our compensation philosophy is carried out under the supervision of the Compensation Committee. The Compensation Committee charter contemplates that the Compensation Committee will meet at least twice per year. The agenda for each meeting is usually developed by the Chair of the Compensation Committee, in consultation with our Chief Executive Officer, Chief Financial Officer and Chief Operating Officer and General Counsel. The Compensation Committee meets regularly in executive session. However, Mr. Small, our Chief Executive Officer, Mr. Barrett, our Chief Financial Officer and Chief Operating Officer, and Ms. Lacy, our General Counsel and Vice President of Legal Operations, in addition to representatives of Setren Smallberg & Associates, an organizational and executive compensation consulting firm, representatives of Radford, an Aon Hewitt Company and the Compensation Committee's independent outside compensation consultant (Compensation Consultant), and representatives of our outside legal counsel, regularly attend portions of the Compensation Committee meetings for the purpose of providing analysis and information to assist management with their recommendations on various human resources and compensation matters and to assist the Compensation Committee in reviewing our and determining executive compensation. These officers generally do not participate in the executive sessions of the Compensation Committee. The Chief Executive Officer may not participate in, or be present during, any deliberation or determination of the Compensation Committee regarding his compensation.

The charter of the Compensation Committee grants the Compensation Committee full access to all of our books, records, facilities and personnel, as well as authority to obtain, at our expense, advice and assistance from compensation consulting firms, legal counsel and other advisors as it deems appropriate to assist it in the evaluation of the compensation of directors, the principal executive officer or the other executive and non-executive officers of the Company, and the fulfillment of its other duties.

Nominating and Governance Committee

The charter for the Nominating and Governance Committee provides that this committee shall consist of not less than two directors. We currently have three members on the Nominating and Governance Committee. Our Nominating and Governance Committee consists of Dr. Lewis (Chair), Mr. Altig and Mr. Holubiak. The Board has determined that each of Dr. Lewis, Mr. Altig and Mr. Holubiak are independent under the listing standards of the NASDAQ Stock Market.

TABLE OF CONTENTS

The primary purpose of our Nominating and Governance Committee is to select, and recommend to our Board, director nominees for each election of directors and recommend any corporate governance guidelines it deems appropriate. Additionally, the Committee has general oversight of the Company's compliance with legal and regulatory requirements of its business operations, other than compliance with securities laws and regulations, including the Company's financial reporting and disclosure obligations, or anti-bribery laws, which in each case shall be the responsibility of the Company's Audit Committee.

The Nominating and Governance Committee has adopted a written charter, which was last amended on October 6, 2016. The Nominating and Governance Committee charter can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. Information on our website is not incorporated by reference in this proxy statement.

The Nominating and Governance Committee will review and assess the adequacy of its charter at least once annually and recommend changes to the Board for approval.

Selection of Board Nominees

In fulfilling its responsibilities to select, and recommend to our Board, director nominees for each election of directors, our Nominating and Governance Committee will consider the following factors:

- the appropriate size of our Board and its committees;
- the perceived needs of our Board for particular skills, background and business experience;
- the skills, background, reputation, and business experience of nominees compared to the skills, background, reputation, and business experience already possessed by other Board members;
- nominees' independence from management; and
- applicable regulatory and listing requirements, including independence requirements and legal considerations.

The Board has adopted a Corporate Governance Policy, which was adopted by the Board on October 6, 2016. The Corporate Governance Policy can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. Information on our website is not incorporated by reference in this proxy statement. The Corporate Governance Policy provides that the Nominating and Governance Committee must be satisfied that each recommended nominee to the Board meets the following minimum qualifications:

- The nominee shall have experience at a strategic or policymaking level in a business, government, non-profit or academic organization of high standing;
- The nominee shall be highly accomplished in his or her respective field, with superior credentials and recognition;
- The nominee shall be well regarded in the community and shall have a long-term reputation for high ethical and moral standards;
- The nominee shall have sufficient time and availability to devote to the affairs of the Company, particularly in light of the number of boards of directors on which such nominee may serve; and
- To the extent such nominee serves or has previously served on other boards, the nominee shall have a demonstrated history of actively contributing at board meetings.

The Nominating and Governance Committee may also establish additional specific, minimum qualifications it believes should be met by any director nominees.

The goal of our Nominating and Governance Committee is to assemble a Board that brings to our Company a variety of perspectives and skills derived from high-quality business and professional experience. Directors should possess high personal and professional ethics, integrity and values, and be committed to representing the best interests of our stockholders. While the Nominating and Governance Committee does not have a specific written policy with regard to the consideration of diversity in identifying director nominees, the Committee does consider diversity to be an additional desirable characteristic in potential nominees.

TABLE OF CONTENTS

Other than the foregoing, there are no stated minimum criteria for director nominees, although our Nominating and Governance Committee may also consider such other factors as it may deem, from time to time, to be in the best interests of the Company and our stockholders.

Our Nominating and Governance Committee will annually evaluate our Board members who are willing to continue in service against the criteria set forth above in determining whether to recommend these directors for re-election.

Candidates for nomination as director may come to the attention of our Nominating and Governance Committee from time to time through incumbent directors, management, stockholders or third parties. Candidates for potential nomination may be considered at meetings of our Nominating and Governance Committee at any point during the year. Such candidates will be evaluated against the criteria set forth above. If our Nominating and Governance Committee believes at any time that it is desirable that our Board consider additional candidates for nomination, the Committee may poll directors and management for suggestions or conduct research to identify possible candidates and may, if our Nominating and Governance Committee believes it is appropriate, engage a third-party search firm to assist in identifying qualified candidates.

Our Nominating and Governance Committee's policy will be to evaluate any recommendation for director nominee proposed by a stockholder. Our bylaws also permit stockholders to nominate directors for consideration at an annual meeting, subject to certain conditions. Any recommendation for director nominee must be submitted in writing to the Corporate Secretary at the following address: Assembly Biosciences, Inc., Attention: Corporate Secretary, 11711 N. Meridian Street, Suite 310, Carmel, IN 46032.

Our bylaws require that any director nomination made by a stockholder for consideration at an annual meeting must be received in writing not more than 90 days nor less than 60 days in advance of the meeting, and at a special meeting called for the purpose of the election of directors not later than the close of business on the tenth business day following the date on which notice of such meeting is first given to our stockholders. Each written notice containing a stockholder nomination of a director at an annual or special meeting must include:

- the name and address of the stockholder who intends to make the nomination and any stockholder associated with such stockholder, and the name and residence address of the person or persons to be nominated;
- the class and number of shares that are beneficially owned by the stockholder and any associated stockholder;
- the nominee holder for, and number of, shares owned beneficially but not of record by such stockholder and any associated stockholder;
- a representation that the stockholder is a holder of record of stock entitled to vote at the meeting and intends to appear in person or by proxy at the meeting to nominate the person or persons specified in the notice;
- a description of all arrangements or understandings between the stockholder and any associated stockholder and each nominee and any other person or persons (naming such person or persons) pursuant to which the nomination or nominations are to be made by the stockholder;
- the name, age, business and residential address, educational background, current principal occupation or employment, and principal occupation or employment for the preceding five (5) full fiscal years of the proposed director candidate;
- a description of the qualifications and background of the proposed director candidate that addresses the minimum qualifications and other criteria for Board membership approved by the Board from time to time and set forth in the Nominating and Governance Committee Charter;
- such other information regarding each nominee proposed by such stockholder as would be required to be disclosed in solicitations of proxies for election of directors, or as would otherwise be

TABLE OF CONTENTS

required, in each case pursuant to Regulation 14A under the Exchange Act including any information that would be required to be included in a proxy statement filed pursuant to Regulation 14A had the nominee been nominated by the board of directors;

- the written consent of each nominee to be named in a proxy statement and to serve as director of the corporation if so elected;
- whether and the extent to which any hedging or other transaction or series of transactions has been entered into by or on behalf of, or any other agreement, arrangement or understanding (including any short position or any borrowing or lending of shares) has been made, the effect or intent of which is to mitigate loss to or manage risk or benefit of share price changes for, or to increase or decrease the voting power of, such stockholder or any associated stockholder with respect to any share of our common stock; and
- to the extent known by the stockholder giving the notice, the name and address of any other stockholder supporting the nominee for election or reelection as a director or the proposal of other business on the date of such stockholder's notice.

Once director candidates are identified, the Nominating and Governance Committee conducts a review and evaluation of the qualifications of any proposed director candidate as it deems appropriate. There is no difference in the evaluation process of a candidate recommended by a stockholder as compared to the evaluation process of a candidate identified by any of the other means described above.

If the Nominating and Governance Committee determines that a candidate should be nominated as a candidate for election to the Board, the candidate's nomination is then recommended to the Board, and the directors may in turn conduct their own review to the extent they deem appropriate. When the Board has agreed upon a candidate, such candidate is recommended to the stockholders for election at an annual meeting of stockholders or appointed as a director by a vote of the Board as appropriate.

All of the current directors have been recommended by the Nominating and Governance Committee to the Board for re-election as our directors at the Annual Meeting, and the Board has approved such recommendations.

Science and Technology Committee

Our Science and Technology Committee consists of Dr. DiMarchi (Chair) and Dr. Lewis. The primary purpose of our Science and Technology Committee is to assist the Board's oversight of the Company's research and development activities and to advise the Board with respect to strategic and tactical scientific matters. In furtherance of its purpose, the Committee reviews, among other things:

- the overall scientific and research and development strategy of the Company;
- our research and development programs;
- our regulatory compliance/quality programs, as applicable;
- related external scientific research, discoveries and commercial developments, as appropriate;
- our overall intellectual property strategies and its portfolio of patents;
- management's decisions regarding the allocation, deployment, utilization of and investment in our scientific assets; and
- management's decisions regarding acquiring or divesting scientific technology or otherwise investing in research or development programs.

[TABLE OF CONTENTS](#)

The Science and Technology Committee has adopted a written charter, which was last amended on June 2, 2016. The Science and Technology Committee charter can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. Information on our website is not incorporated by reference in this proxy statement.

The Science and Technology Committee charter requires that the Science and Technology Committee meet at least twice per year. The Chair of the Committee, in consultation with the other members and management, may set meeting agendas. The Science and Technology Committee will review and assess the adequacy of its charter at least once annually and recommend changes to the Board for approval.

STOCKHOLDER COMMUNICATIONS

Stockholders and other interested parties may communicate with the Board by writing to Derek A. Small, our President and Chief Executive Officer, at Assembly Biosciences, Inc., 11711 N. Meridian Street, Suite 310, Carmel, IN 46032. Mr. Small received no such communications in 2016. Upon receipt of a stockholder communication indicating a desire to communicate with the Board, Mr. Small will review the communication and determine whether the communication should be directed to the Board or any individual director. All communications will be forwarded in this manner; provided, however, that Mr. Small reserves the right not to forward to the Board or any individual director any materials that he deems in his reasonable discretion to be unduly frivolous, hostile, threatening or similarly inappropriate for communication to the Board or any individual director.

CODE OF ETHICS

Our Board has adopted a Code of Ethics for our principal executive officer and all senior financial officers and a Code of Conduct applicable to all of our employees and our directors. Both codes can be found in the Corporate Governance section of the Investor Relations section of our website at www.assemblybio.com. If we make any substantive amendments to, or grant any waivers from, the Code of Ethics for our principal executive officer, principal financial officer, principal accounting officer, controller or persons performing similar functions, or any officer or director, we will disclose the nature of such amendment or waiver on our website or in a current report on Form 8-K.

DIRECTOR COMPENSATION

Our directors play a critical role in guiding our strategic direction and overseeing the management of Assembly. The many responsibilities and risks and the substantial time commitment of being a director require that we provide adequate compensation commensurate with our directors' workload and opportunity costs. Non-employee directors receive a combination of annual cash retainers and stock option grants in amounts that correlate to their responsibilities and levels of Board participation, including service on Board committees. Our only employee director, Mr. Small, receives no separate compensation for his service as a director.

The following table sets forth the annual cash compensation payable to our non-employee directors in 2016.

Director Position	Annual Cash Compensation⁽¹⁾
Chair of the Board	\$ 30,000
All Non-Employee Directors	\$ 35,000
Audit Committee Chair	\$ 15,000
Audit Committee (Non-Chair members)	\$ 7,500
Compensation Committee Chair	\$ 10,000
Compensation Committee (Non-Chair members)	\$ 5,000
Nominating and Governance Committee Chair	\$ 10,000
Nominating and Governance Committee (Non-Chair members)	\$ 5,000
Science and Technology Committee Chair	\$ 10,000
Science and Technology Committee (Non-Chair members)	\$ 5,000

(1) The annual cash compensation that the Company pays to its Board members, other than Mr. Small is based on their positions on the Board or the committees of the Board, and the Company does not compensate the Board members on a per meeting basis. The amounts reflected in the table above were approved by the Board in 2016 and will remain in effect for calendar year 2017.

In 2015, it was established that upon joining the Board, each new non-employee director would be granted an option to purchase 30,000 shares of common stock of the Company and each re-elected non-employee director would be granted an option to purchase 10,000 shares of common stock of the Company. This practice was continued in 2016. In 2017, the Compensation Committee recommended, and the Board approved, that on the date of our annual meeting of stockholders, each re-elected non-employee director

TABLE OF CONTENTS

will be entitled to receive a grant of an option to purchase 7,500 shares of common stock, which will vest in full upon the earlier of the first anniversary of the grant date and the next annual meeting of stockholders. The exercise price per share of each of these options is 100% of the fair market value of a share of our common stock on the date of the grant of the option. All options have a term of ten (10) years. The Compensation Committee did not make a recommendation regarding equity compensation for new directors joining the Board in 2017.

The following table sets forth information regarding cash and non-cash compensation earned by or paid to each of our non-employee directors during 2016.

<u>Name</u>	<u>Fees Earned or Paid in Cash (\$)</u>	<u>Option Awards (\$)⁽¹⁾⁽²⁾</u>	<u>Total (\$)</u>
Anthony E. Altig	47,500	\$ 41,588	\$ 89,088
Mark Auerbach	55,000	\$ 41,588	\$ 96,588
Richard DiMarchi, Ph.D.	45,000	\$ 41,588	\$ 86,588
Myron Z. Holubiak	50,000	\$ 41,588	\$ 91,588
Alan J. Lewis, Ph.D.	48,125	\$ 41,588	\$ 89,713
William R. Ringo, Jr.	77,500	\$ 41,588	\$ 119,088

(1) As of December 31, 2016, our non-employee directors held the following unexercised options to purchase shares of our common stock: Mr. Altig, 84,000 shares; Mr. Auerbach, 84,000 shares; Dr. DiMarchi, 84,000 shares; Mr. Holubiak, 84,000 shares; Dr. Lewis, 40,000 shares and Mr. Ringo, 84,000 shares.

(2) The reported amounts in the table above represent the aggregate grant date fair value of the options granted in 2016 computed in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Notes 2 and 8 of the financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2016.

**PROPOSAL NO. 2: NON-BINDING, ADVISORY RESOLUTION ON COMPENSATION OF
THE COMPANY'S NAMED EXECUTIVE OFFICERS**

Under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the Dodd-Frank Act) and Section 14A of the Exchange Act, the Company's stockholders are entitled to vote to approve, on a non-binding, advisory basis, the compensation of the Company's named executive officers (Named Executive Officers or NEOs) as disclosed in this proxy statement in accordance with the SEC rules (commonly known as the "Say on Pay" vote). This vote is not intended to address any specific item of compensation, but rather the overall compensation of the Company's NEOs and the philosophy, policies and practices described in this proxy statement.

At the 2016 Annual Meeting of Stockholders, we provided our stockholders with the opportunity to cast an advisory vote on the compensation of our named executive officers. Over 99% of the votes cast on our "Say on Pay" vote were voted in favor of the proposal in 2016.

The compensation of the Company's NEOs subject to this vote is disclosed in the Executive Compensation section, the Compensation Committee's report, the Compensation Discussion and Analysis, the compensation tables and the related narrative disclosure contained in this proxy statement. As discussed in these disclosures, the Company believes that its compensation philosophy is to provide competitive overall compensation that attracts and retains top performers. To achieve these goals, our compensation program is structured to:

- provide total compensation and compensation elements that are competitive with those companies that are competing for available employees;
- provide a mix of compensation that offers (i) a market competitive base compensation, with a potential to earn additional amounts based on achievement of defined corporate goals, which are generally expected to be achieved within 12 months, and (ii) the opportunity to share in the long-term growth of our company through equity compensation; and
- reward exceptional performance by individual employees.

Accordingly, the Board is asking the stockholders to indicate their support for the compensation of the Company's NEOs as described in this proxy statement by casting a non-binding, advisory vote "FOR" the following resolution:

"RESOLVED, that the Company's stockholders hereby approve, on an advisory basis, the compensation of the Company's Named Executive Officers, as disclosed in the proxy statement for the 2017 Annual Meeting of Stockholders pursuant to the compensation disclosure rules of the Securities and Exchange Commission, including the Compensation Discussion and Analysis, the compensation tables and narrative discussion in the proxy statement for the 2017 Annual Meeting of Stockholders."

The Executive Compensation section of this proxy statement contains more details on the Company's executive compensation and we urge you to read it carefully before casting your vote on this proposal. Because the vote is advisory, it is not binding on the Company, the Board or the Compensation Committee of the Board. Nevertheless, the views expressed by the stockholders, whether through this vote or otherwise, are important to our management, the Board and the Compensation Committee and our management, the Board and Compensation Committee all intend to consider the results of this vote in making determinations in the future regarding executive compensation arrangements and the Company's executive compensation principles, policies and procedures.

The Company's current practice is to submit the compensation of its Named Executive Officers to its stockholders for an advisory vote on an annual basis. Accordingly, the next stockholder advisory vote on the compensation of the Company's named executive officers after the Annual Meeting is expected to take place at the 2018 Annual Meeting of Stockholders.

[TABLE OF CONTENTS](#)

Required Vote

Assuming a quorum is present, to be approved, a majority of the shares of common stock held by holders present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 2 must be voted “FOR” the approval of the non-binding, advisory vote on the compensation of Assembly’s Named Executive Officers. Abstentions will be deemed a vote against Proposal No. 2. Broker non-votes will not be considered towards vote totals on Proposal No. 2 and will have no effect on the outcome of the vote.

Recommendation of the Board of Directors

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE “FOR” THE RESOLUTION APPROVING
THE COMPENSATION OF THE COMPANY’S NAMED EXECUTIVE OFFICERS.**

**PROPOSAL NO. 3: RATIFICATION OF THE SELECTION OF
THE INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR ASSEMBLY**

The Board has selected Ernst & Young LLP, or Ernst & Young, as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017 and has further directed that management submit the selection of the independent registered public accounting firm for ratification by the stockholders at the Annual Meeting. Ernst & Young has served as our independent registered public accounting firm since May 13, 2015. EisnerAmper LLP, or EisnerAmper, was our independent registered public accounting firm through May 11, 2015. On May 11, 2015, the Company dismissed EisnerAmper as our independent registered public accounting firm. EisnerAmper's reports on Assembly's financial statements as of December 31, 2014 and 2013, and for the two years then ended did not contain an adverse opinion or a disclaimer of opinion, and were not qualified or modified as to uncertainty, audit scope or accounting principles. The Audit Committee recommended and approved the change in accountants. During the two years ended December 31, 2014 and through May 11, 2015, there were no: (a) disagreements with EisnerAmper on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedure, which disagreements, if not resolved to EisnerAmper's satisfaction, would have caused EisnerAmper to make reference to the subject matter thereof in connection with its reports on the Company's financial statements as of December 31, 2014 and 2013, or (b) "reportable events", as defined under Item 304(a)(1)(v) of Regulation S-K. EisnerAmper indicated to the Company that EisnerAmper concurs with the foregoing statements contained in the paragraphs above as they relate to EisnerAmper and furnished a letter dated May 11, 2015 to the United States Securities and Exchange Commission to that effect.

Neither our bylaws nor other governing documents or law require stockholder ratification of the selection of Ernst & Young as the Company's independent registered public accounting firm. However, the Board is submitting the selection of Ernst & Young to the stockholders for ratification as a matter of good corporate practice. If the stockholders fail to ratify the selection, the Board will reconsider whether or not to retain Ernst & Young. Even if the selection is ratified, the Board in its discretion may direct the appointment of different independent registered public accounting firm at any time during the year if the Board determines that such a change would be in the best interest of the Company and its stockholders.

Independent Registered Public Accounting Firms — Principal Accounting Fees and Services

Audit Fees. Audit fees include fees billed to us by (i) Ernst & Young in connection with its annual audit of our financial statements for fiscal years 2016 and 2015 and procedures related to our regulatory filings and (ii) EisnerAmper in connection with its procedures related to our regulatory filings, including regulatory filings and comfort letters for our 2015 at the market sales program. The aggregate fees billed to us by Ernst & Young for its audit services rendered for the fiscal years ended December 31, 2016 and 2015 were approximately \$364,500 and \$300,000 in fees, respectively and \$6,199 and \$2,586 in expenses, respectively. The aggregate fees billed to us by EisnerAmper for its audit services rendered for the fiscal year ended December 31, 2015 was approximately \$54,470.

Audit-Related Fees. Audit-related services consist solely of routine accounting consultations. During the fiscal years ended December 31, 2016 and 2015, neither Ernst & Young nor EisnerAmper billed us for any audit-related services.

Tax Fees. Tax fees include corporate tax compliance, assistance with an IRS examination, as well as advisory services. The aggregate fees billed to us by EisnerAmper for tax-related services in the fiscal years ended December 31, 2015 were approximately \$118,470. The aggregate fees billed to us by Ernst & Young for tax-related services in the fiscal years ended December 31, 2016 and 2015 were approximately \$50,136 and \$0, respectively.

All Other Fees. During the fiscal years ended December 31, 2016 and 2015, EisnerAmper did not bill us for any other fees. During the fiscal year ended December 31, 2016 and 2015, Ernst & Young billed us \$3,000 and \$0, respectively, for EY online services.

Ernst & Young did not engage persons who were not full-time, permanent employees to perform more than 50% of the hours needed to audit the Company's financial statements for the fiscal year ended December 31, 2016 and 2015.

TABLE OF CONTENTS

The Audit Committee of the Board considered all of the above activities to be compatible with the maintenance of EisnerAmper's and Ernst & Young's independence. The Audit Committee discussed these services with Ernst & Young, EisnerAmper and our management to determine that they are permitted under the rules and regulations concerning auditor independence promulgated by the SEC to implement the Sarbanes-Oxley Act of 2002, as well as the American Institute of Certified Public Accountants.

Prior to October 2, 2015, the Audit Committee did not have formal pre-approval policies and procedures in place; however, the Audit Committee pre-approved all of the services performed by EisnerAmper and Ernst & Young as discussed above, as required by SEC regulations. Effective as of October 2, 2015, the charter of the Audit Committee was amended to provide that the Audit Committee shall pre-approve all auditing services and the terms thereof (which may include providing comfort letters in connection with securities underwritings) and non-audit services (other than non-audit services prohibited under Section 10A(g) of the Exchange Act or the applicable rules of the SEC or the Public Company Accounting Oversight Board) to be provided to us by the independent auditors. The pre-approval requirement is waived with respect to the provision of non-audit services for us if the "*de minimus*" provisions of Section 10A(i)(1)(B) of the Exchange Act are satisfied. This authority to pre-approve non-audit services may be delegated to one or more members of the Audit Committee, who shall present all decisions to pre-approve an activity to the full Audit Committee at its first meeting following such decision. The Audit Committee pre-approved all services provided by our independent registered public accounting firms for the fiscal years ended December 31, 2016, 2015 and 2014.

Required Vote

Assuming a quorum is present, to be approved, a majority of the shares of common stock held by holders present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 3 must be voted "FOR" the ratification of the selection of Ernst & Young as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2017. Abstentions will be deemed a vote against Proposal No. 3. Broker non-votes will not be considered towards vote totals on Proposal No. 3.

Recommendation of the Board of Directors

**THE BOARD OF DIRECTORS
RECOMMENDS A VOTE "FOR" THE RATIFICATION OF THE SELECTION OF ERNST &
YOUNG LLP AS THE COMPANY'S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM.**

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

Principal Stockholders

The following table sets forth certain information regarding the ownership of shares of our common stock as of March 31, 2017 by (1) each person known by us to beneficially own more than 5% of the outstanding shares of common stock, (2) each director of our company, (3) each of the Named Executive Officers, as listed in the Summary Compensation Table below, and (4) all directors and executive officers of our company as a group.

This table is based upon information supplied by our Named Executive Officers, directors and principal stockholders and from Schedules 13G filed with the SEC. Unless otherwise indicated in the footnotes to this table and subject to community property laws where applicable, each of the stockholders named in this table has sole voting and investment power with respect to the shares indicated as beneficially owned by them, subject to community property laws, where applicable. Share ownership in each case includes shares issuable upon exercise of options and warrants that may be exercised within 60 days after March 31, 2017 for purposes of computing the percentage of common stock owned by such person, but not for purposes of computing the percentage owned by any other person. Unless otherwise noted, the address for each person listed below is c/o Assembly Biosciences, Inc., 11711 N. Meridian Street, Suite 310, Carmel, IN 46032. Applicable percentages are based on 17,305,044 shares outstanding on April 6, 2017.

There are no arrangements, known to Assembly, including any pledge by any person of securities of Assembly, the operation of which may at a subsequent date result in a change in control of Assembly.

Name of Beneficial Owner	Shares Beneficially Owned	Percentage Owned (%)
5% Stockholders:		
EcoR1 Capital, LLC ⁽¹⁾ 409 Illinois Street San Francisco, CA 94158	2,943,164	17.1%
Jennison Associates LLC ⁽²⁾ 466 Lexington Avenue New York, NY 10017	2,078,010	12.1%
OrbiMed Advisors LLC OrbiMed Capital LLC ⁽³⁾ 601 Lexington Avenue, 54 th Floor New York, NY 10022	1,397,100	8.1%
Adam Zlotnick ⁽⁴⁾ 615 Clifton Avenue Bloomington, IN 47401	1,449,009	8.2%
Acuta Capital Partners LLC ⁽⁵⁾ 1301 Shoreway Road, Suite 350 Belmont, CA 94002	976,599	5.7%
Directors and Named Executive Officers:		
Anthony E. Altig ⁽⁶⁾	82,000	*
Mark Auerbach ⁽⁷⁾	74,000	*
Richard DiMarchi, Ph.D. ⁽⁸⁾	393,240	2.3%
Myron Z. Holubiak ⁽⁷⁾	74,000	*
Alan J. Lewis, Ph.D. ⁽⁷⁾	10,000	*
William R. Ringo, Jr. ⁽⁹⁾	94,465	*
Derek A. Small ⁽¹⁰⁾	1,100,629	6.2%
Miguel S. Barbosa, Ph.D. ⁽¹¹⁾	0	*

TABLE OF CONTENTS

<u>Name of Beneficial Owner</u>	<u>Shares Beneficially Owned</u>	<u>Percentage Owned (%)</u>
David J. Barrett ⁽¹²⁾	761,736	4.2%
Richard J. Colonna, Ph.D. ⁽⁷⁾	50,000	*
Thomas E. Rollins ⁽⁷⁾	31,250	*
All directors and executive officers as a group (12 persons) ⁽¹³⁾	3,457,971	19.6%

* Less than 1%.

- (1) Based on the information contained in the Schedule 13G/A filed with the SEC on June 27, 2016 by EcoR1 Capital, LLC, Oleg Nodelman, and EcoR1 Capital Fund Qualified, L.P. (EcoR1 Qualified Fund). According to the Schedule 13G/A, as of June 20, 2016, all three reporting persons hold shared voting and dispositive power over the shares of common stock. EcoR1 Qualified Fund may be deemed to beneficially own 2,162,029 shares of common stock (12.1%). EcoR1 Capital, LLC, as the general partner of EcoR1 Qualified Fund, may be deemed to beneficially own the 2,943,164 shares of common stock owned by EcoR1 Qualified Fund. Oleg. Nodelman, as the control person of EcoR1 Capital, LLC may be deemed to beneficially own the 2,943,164 shares of common stock, including 2,162,029 deemed beneficially owned by EcoR1 Qualified Fund. According to the Schedule 13G/A, EcoR1 Qualified Fund is not a member of a group and expressly disclaims membership in a group. In addition, EcoR1 Qualified Fund disclaims that it is a beneficial owner of any stock covered by the Schedule 13G/A. Each filer also disclaims beneficial ownership of the stock except to the extent of that person's pecuniary interest therein.
- (2) Based on the information contained in the Schedule 13G/A filed with the SEC on January 24, 2017 by Prudential Financial, Inc. (the Prudential 13G/A) and the Schedule 13G/A filed with the SEC on February 3, 2017 by Jennison Associates, LLC (the Jennison 13G/A). According to the Prudential 13G/A, as of December 31, 2016, Prudential Financial, Inc. holds sole voting and dispositive power over 180 shares of common stock and through its indirect ownership of 100% of the equity interest in Jennison Associates Prudential Financial, Inc. may be deemed to be the beneficial owner of an aggregate amount of 2,077,830 shares of common stock, of which 2077,830 shares (12.1%) are held by Jennison Associates, LLC. According to the Jennison Schedule 13G/A, as of December 31, 2016, Jennison Associates, LLC has sole voting and dispositive power over 2,025,870 of the shares of common stock.
- (3) Based on the information contained in the Schedule 13G filed with the SEC on February 12, 2016 by OrbiMed Advisors LLC, OrbiMed Capital LLC and Samuel D. Isaly. According to the Schedule 13G, as of December 31, 2015, the reporting persons hold 8.11% (3.76% in the case of OrbiMed Advisors, LLC and 4.35% in the case of OrbiMed Capital LLC) of the shares of common stock on behalf of other persons who have the right to receive or the power to direct the receipt of dividends from, or proceeds from the sale of, such securities. No one such other person's interest in the securities whose ownership is reported relates to more than 5% of the class. OrbiMed Advisors, LLC and OrbiMed Capital LLC filed the Schedule 13G in their respective capacities as investment advisors and Samuel D. Isaly filed in his capacity as a control person of OrbiMed Advisors LLC and OrbiMed Capital LLC.
- (4) Includes 1,321,009 shares of common stock and 128,000 shares of common stock that Dr. Zlotnick has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (5) Based on the information contained in the Schedule 13G/A filed with the SEC on February 16, 2017 by Acuta Capital Partners LLC (Acuta), as of December 31, 2016, Acuta is the beneficial owner of 976,599 shares. Acuta has sole voting power and sole dispositive power to all of such shares.
- (6) Includes 8,000 shares of common stock and 74,000 shares of common stock that Mr. Altig has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (7) Includes shares of common stock that the individual has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (8) Includes 319,240 shares of common stock and 74,000 shares of common stock that Dr. DiMarchi has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (9) Includes 20,465 shares of common stock and 74,000 shares of common stock that Mr. Ringo has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (10) Includes 634,391 shares of common stock and 466,238 shares of common stock that Mr. Small has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.

TABLE OF CONTENTS

- (11) Individual has a stock option grant that will not be exercisable for any shares within 60 days of March 31, 2017.
- (12) Consists of (i) 19,936 shares of common stock, and (ii) 741,800 shares of common stock that Mr. Barrett has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.
- (13) Includes the shares of common stock described in footnotes (6) through (11). Also includes 621,651 shares of common stock owned by Dr. Lopatin, our Chief Medical Officer, 5,000 shares of common stock beneficially owned by Dr. Lopatin's wife and 160,000 shares of common stock that Dr. Lopatin has the right to acquire from us within 60 days of March 31, 2017 pursuant to the exercise of stock options.

EXECUTIVE OFFICERS

As of March 31, 2017, our executive officers are Derek A. Small, our President and Chief Executive Officer, David J. Barrett, our Chief Financial Officer and Chief Operating Officer, Dr. Uri Lopatin, our Chief Medical Officer and Vice President, Research and Development, Dr. Richard J. Colonno, our Chief Scientific Officer, Dr. Miguel S. Barbosa, our Chief Scientific Officer-Microbiome and Head of the Microbiome Program and Thomas E. Rollins, our Chief Development Officer. Information on Mr. Small is provided above under the heading “Nominees for Director.” Information on each of Messrs. Barrett and Rollins and Drs. Lopatin, Colonno and Barbosa is provided below.

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Business Experience</u>
David J. Barrett	41	Mr. Barrett joined as Chief Financial Officer in July 2010 and became our Chief Operating Officer in February 2015. From April 2006 to September 2009, Mr. Barrett served as Chief Financial Officer of Neuro-Hitech, Inc., a publicly traded company focused on developing, marketing and distributing branded and generic pharmaceutical products. From September 2003 to April 2006, Mr. Barrett was the Chief Financial Officer and Vice President of Finance of Overture Asset Managers and Overture Financial Services, which, at the time, was a start-up asset management firm that assembled investment products and platforms to distribute turnkey and unbundled investment solutions to financial intermediaries and institutional investors. From July 1999 to September 2003, Mr. Barrett was employed as a Manager at Deloitte & Touche, LLP. From May 2011 to July 2015, Mr. Barrett was a director of Coronado Biosciences, Inc. (NASDAQ: CNDO), a biopharmaceutical company. Mr. Barrett received his B.S. in Accounting and Economics and his M.S. in Accounting from the University of Florida. He is a certified public accountant.
Miguel S. Barbosa, Ph.D.	59	Dr. Barbosa joined as our Chief Scientific Officer of the Microbiome Program in September 2016 and became Head of the Microbiome Program in January 2017. Dr. Barbosa has more than two decades of experience leading drug discovery and development programs at major pharmaceutical and biotechnology companies. From September 2015 to June 2016, Dr. Barbosa was the Executive Vice President and Chief Scientific Officer at Mirna Therapeutics, Inc. From April 2015 to September 2015, Dr. Barbosa was Executive in Residence, Therapeutic Innovation at the California Innovation Center, where he was responsible for lead identification and development of new external R&D models and business building opportunities. From June 2010 to March 2015, Dr. Barbosa was Vice President of Immunology Research and External Innovation at Janssen Research & Development LLC, where he oversaw immunology R&D and new program initiatives, including establishing the foundation for, and then leading, Johnson & Johnson’s new microbiome enterprise. Earlier in his career, Dr. Barbosa held positions of increasing responsibility managing new drug R&D programs at prominent biopharmaceutical firms, including Radnor & Spring House, Centocor R&D, a J&J Company, Signal Pharmaceuticals, Tanabe Research Laboratories USA, Inc. and Chugai Pharma USA LLC. Dr. Barbosa received a B.S. in Genetics from the University of California, Davis and a Ph.D. in Microbiology and Immunology from the University of California, Los Angeles. He completed a post-doctoral fellowship at the National Cancer Institute.

TABLE OF CONTENTS

<u>Name</u>	<u>Age (as of 03/31/17)</u>	<u>Business Experience</u>
Richard J. Colonna, Ph.D	67	Dr. Colonna joined as Chief Scientific Officer in January 2016 and has been instrumental in the discovery and development of multiple approved antiviral drugs, including Baraclude® and Reyataz.® From September 2007 to January 2016, Dr. Colonna was the Chief Science Officer of Presidio Pharmaceuticals, Inc., where he directed its hepatitis C (HCV) antiviral programs, including the discovery and development of the HCV NS5A inhibitor ravidasvir. From June 1991 to August 2007, Dr. Colonna was Vice President, Infectious Diseases Drug Discovery at Bristol-Myers Squibb Co., where he played a pivotal role in building Bristol-Myers Squibb's antiviral franchise. From August 1982 to May 1991, he was Senior Director of Antiviral Research at Merck Research Labs. Dr. Colonna received a B.A. in Biology and Chemistry from Kansas Wesleyan University and a Ph.D. in Microbiology from the University of Kansas and has co-authored more than 160 scientific articles.
Uri Lopatin, M.D.	45	Dr. Lopatin joined as Chief Medical Officer and Vice President Research and Development in July 2014 upon the closing of the Merger. Prior to the Merger, Dr. Lopatin was Chief Medical Officer and Vice President Research and Development, a position he held since October 2012. Prior to that, he was a Senior Director for Clinical and Translational Research-Liver Disease at Gilead Sciences, Inc. from October 2010 to September 2012 and a Translational Medical Leader at Roche from May 2008 to September 2010. He has designed and coordinated pre-clinical and clinical collaborations, as well as phase I through IV clinical studies of multiple new molecular entities. Dr. Lopatin has published extensively, especially on hepatitis B and immunology and is a co-author of multiple patents in the field of treatment and diagnosis for viral hepatitis. Dr. Lopatin received his Infectious Disease Board certification following fellowship training in Infectious Disease at the National Institute of Health, and internal medicine board certification following completion of residency at New York University. Dr. Lopatin received a B.S. in Biology, cum laude with distinction, from Cornell University in 1994 and received his M.D. degree in 2000 from the University of Medicine and Dentistry-New Jersey Medical School, where he was awarded the Stanley S. Bergen medal of excellence.
Thomas E. Rollins	61	Mr. Rollins joined Assembly as Chief Development Officer and Head of the Microbiome Program in January 2016. From July 2012 to April 2015, Mr. Rollins served in various capacities for Cubist Pharmaceuticals, Inc. an anti-infective drug developer, with his last position being Senior Vice President and Global Head, Program and Portfolio Management, where he oversaw global product development. During his tenure, Mr. Rollins oversaw the global development and commercialization of the anti-bacterial drugs that helped transform Cubist Pharmaceuticals Inc. into a multi-program, multi-product company. From December 2009 to June 2012, Mr. Rollins was Senior Vice President, Program Management at Sunovion Pharmaceuticals, where he led the Sunovion R&D harmonization and portfolio prioritization process. From January 2005 to December 2009, Mr. Rollins worked at Sepracor, Inc. as Senior Vice President of Development, Mr. Rollins established an efficient and productive semi-virtual drug development organization. From 1981 to 1990, Mr. Rollins was a researcher and from 1990 to 1994 he was part of the Project Management group at Merck Research Laboratories, where he was co-team leader for a number of major global products. Mr. Rollins received an M.B.A. from Rutgers University and B.S. and M.S. degrees in Biochemistry from Michigan State University.

TABLE OF CONTENTS

Executive Compensation

Compensation Discussion and Analysis

Compensation Philosophy and Overview

In general, the Company's compensation philosophy is to provide competitive overall compensation that attracts, retains and motivates superior performers. The Compensation Committee believes that executive compensation should be designed to promote both the short-term and long-term goals of the Company. Accordingly, an important component of the Committee's compensation philosophy is to align the financial interests of the Company's executive officers with those of our stockholders. At the 2016 Annual Meeting of Stockholders, we provided our stockholders with the opportunity to cast an advisory vote on the compensation of our named executive officers. Over 99% of the votes cast on our "Say on Pay" vote were voted in favor of the proposal in 2016. While the Compensation Committee considered the results of the non-binding, advisory vote in favor of the resolution approving the compensation of the Company's named executive officers in establishing the fiscal 2017 compensation, no specific actions were deemed necessary, because the Compensation Committee believed the results of the Say on Pay vote was a confirmation that stockholders were in general agreement with the Compensation Committee's compensation philosophy. The Compensation Committee will continue to consider the Say on Pay voting results and other feedback provided by the Company's stockholders when making future compensation decisions concerning the Company's executive officers.

To achieve the above goals, our compensation program is structured to:

- provide total compensation and compensation elements that are competitive with those companies that are competing for available employees;
- provide a mix of compensation that offers (i) a market-competitive base compensation, with a potential to earn additional amounts based on achievement of defined corporate goals, which are generally expected to be achieved within 12 months, and (ii) the opportunity to share in the long-term growth of our company through equity compensation; and
- reward exceptional performance by individual employees.

To implement its compensation philosophy, the Compensation Committee has determined that the primary elements of our NEOs' compensation should consist of base salary, annual incentive bonus and long-term equity incentive awards.

Named Executive Officers

Our named executive officers for 2016 are as follows:

<u>Name</u>	<u>Title</u>
Derek A. Small	President and Chief Executive Officer
David J. Barrett	Chief Financial Officer and Chief Operating Officer
Richard J. Colonno, Ph.D.	Chief Scientific Officer
Miguel S. Barbosa, Ph.D.	Chief Scientific Officer-Microbiome and Head of the Microbiome Program
Thomas E. Rollins	Chief Development Officer

Recent Accomplishments by Our Management Team

- Assembled a strong management team for our two innovative platform programs.

HBV

- Completed nonclinical studies on our lead HBV product candidate.
- Initiated a Phase 1a trial in November 2016 and completed the Phase 1a dose ranging portion of the trial in February 2017.
- Advanced a number of second generation molecules toward possible candidate selection in our HBV program.

TABLE OF CONTENTS

Microbiome

- Expanded microbiome capabilities and expect to initiate a Phase 1b clinical trial in patients with recalcitrant *C. difficile* infections (rCDI) during the second half of 2017.
- In January 2017, we entered into a collaboration agreement with Allergan International Limited PLC to develop and commercialize select gastrointestinal programs. Received upfront payment of \$50 million and granted Allergan an exclusive worldwide license for rights to preclinical compounds ABI-M201 and ABI-M301 targeting ulcerative colitis and Crohn's disease as well as two additional compounds to be identified by us for irritable bowel syndromes.

Independent Compensation Consultants

In September 2015, the Compensation Committee approved the engagement of the Compensation Consultant as the independent adviser to the Compensation Committee. The Compensation Consultant's fees were paid by the Company but approved by the Compensation Committee. The Compensation Consultant was retained to conduct an analysis for the 2016 compensation cycle, and provide advice on, among other things, the appropriate peer group, executive compensation for our Chief Executive Officer (CEO) and other executive officers, and non-executive market compensation below the executive level. The Compensation Consultant conducted analysis and provided advice on, among other things, the appropriate peer group, officer cash bonus structure, annual compensation for the CEO and other executive officers and compensation trends in the biotechnology industry. The Compensation Committee evaluates the criteria used in establishing the peer group at least annually, to ensure that it appropriately represents the companies competing with us to attract and retain talent. The Compensation Committee seeks input from management in addition to the Compensation Consultant to ensure the peer group is reflective of our current business objectives.

The Compensation Consultant reports directly to the Compensation Committee, which retains sole authority to direct the work and employ the consultant. The Compensation Committee regularly reviews the services provided by the Compensation Consultant and believes that at all times the Compensation Consultant was engaged by the Compensation Committee, such engagement was consistent with NASDAQ Stock Market listing standards.

The Compensation Committee has determined that the Compensation Consultant's work did not raise any conflicts of interest in 2016. In making this assessment, the Compensation Committee considered the independence factors enumerated in Rule 10C-1(b) under the Exchange Act, including the fact that the Compensation Consultant does not provide any other services to the Company, the level of fees received from the Company as a percentage of the Compensation Consultant's total revenue, policies and procedures employed by the Compensation Consultant to prevent conflicts of interest, and whether the individual Compensation Consultant advisers to the Compensation Committee own any of the Company's stock or have any business or personal relationships with members of the Compensation Committee or our executive officers. The Compensation Committee continues to monitor the independence of its Compensation Consultant on a periodic basis.

Compensation Adjustments and Peer Group Process

The implementation of our compensation philosophy is carried out under the supervision of the Compensation Committee. The compensation for our CEO is reviewed and approved by our Compensation Committee. The Compensation Committee also has direct responsibility for reviewing and approving the compensation of the direct reports to the CEO, including all of our executive officers. To assist the Compensation Committee, the CEO makes recommendations to the Compensation Committee as to specific elements (*i.e.*, salary, bonus and equity awards) of compensation for the other executive officers. The CEO does not make recommendations with respect to his own compensation. Management, under the guidelines and policies established by the Compensation Committee, makes decisions on all aspects of compensation for non-executive officer employees.

Mr. Small, our CEO, Mr. Barrett, our Chief Financial Officer and Elizabeth Lacy, our General Counsel, in addition to the Compensation Consultant and outside legal counsel, regularly attend portions of the Compensation Committee meetings for the purpose of providing analysis, information and management's recommendations on various human resources and compensation matters. The members of management

TABLE OF CONTENTS

generally do not participate in the executive sessions of the Compensation Committee unless invited by the Compensation Committee to provide specific information during closed session. The CEO is not present for any deliberation on, or votes related, to his compensation.

We generally review our compensation practices on an annual basis over the course of several meetings of the Compensation Committee and the Board. The first step in the process is that the Compensation Committee, with the support of its Compensation Consultant and management, reviews trends in biotechnology compensation practices and reviews and approves the list of peer companies used in the later stages of the process. As part of its analysis for 2016, the Compensation Consultant collected and analyzed compensation information from a comparative group of biotechnology companies, or peer group, approved by the Compensation Committee. The Compensation Committee evaluates the criteria used in establishing the peer group at least annually to ensure that it appropriately represents the companies competing with us to attract and retain talent. The Compensation Committee seeks input from management in addition to the Compensation Committee's Compensation Consultant to ensure the peer group is consistent with our current business model.

The list of peer companies is approved based on various factors including industry classification, market capitalization, headcount, stage of development, actual or potential product revenue and product focus. During 2015, we used a peer group that included biotechnology companies with a market capitalization below \$500 million (the 2015 Peer Group). The 2015 Peer Group was used in connection with 2015 compensation decisions. As part of the 2016 annual review process, the Compensation Committee re-evaluated the 2015 Peer Group to determine if any changes were appropriate. As part of the 2016 annual review process, the Compensation Committee re-evaluated the 2015 Peer Group and, based upon market capitalization criteria of between \$60 million and \$500 million (with \$133 million being the 50th percentile) and headcount (with 41 employees being the 50th percentile), approved the removal of Aptose Biosciences, Inc., Asterias Biotherapeutics, Inc., Bio-Path Holdings, Inc., iBio, Inc., Loxo Oncology, Inc., NanoVehicles, Inc., Onconova Therapeutics, Inc. and ProQR Therapeutics, NV from the peer group and the addition of new companies noted below to the peer group. The revised peer group (the 2016 Peer Group) set forth below was used to determine compensation decisions for 2016.

Arbutus Biopharma Corp.	Dicerna Pharmaceuticals, Inc.	Neuralstem, Inc.
Arrowhead Pharmaceuticals, Inc. (f/k/a Arrowhead Research Corp.)	Five Prime Therapeutics, Inc.(*)	Cascadian Therapeutics(*) (f/k/a Oncothyreon Inc.)
aTyr Pharma, Inc.(*)	Flex Pharma, Inc.(*)	Regulus Therapeutics, Inc.(*)
Bellicum Pharmaceuticals, Inc.(*)	Ignyta, Inc.	Sangamo Bioscience Inc.(*)
Calithera Biosciences, Inc.	Immune Design Corp.	SCYNEXIS Inc.
Capricor Therapeutics, Inc.	Medgenics, Inc.(*)	Synthetic Biologics Inc.
ContraFect Corp.	Mirati Therapeutics, Inc.(*)	

(*) Company added to 2016 Peer Group.

After the list of peer companies is approved, the Compensation Consultant presents the Compensation Committee with recommendations regarding proposed adjustments to compensation elements and a variety of supporting data, including comparative compensation information from the approved peer group. This is presented individually for executive officers, including the NEOs. Management and the independent Compensation Consultant each include significant supporting data with the presentation. These recommendations are discussed with and without management present and are discussed with the independent Compensation Consultant. The Compensation Committee then determines what, if any, adjustments to the compensation elements are appropriate for executive officers other than the CEO.

The Compensation Committee also reviews the market information provided by the Compensation Consultant, considers the CEO's performance and experience and makes determinations regarding adjustments to the CEO's compensation. These discussions are conducted in executive sessions without involvement by management.

TABLE OF CONTENTS

Components of our Executive Compensation Program

The principal components of our executive compensation program are base salary, annual bonus and long-term equity incentive awards. Our Compensation Committee believes that each component of executive compensation must be evaluated and determined with reference to competitive market data, individual and corporate performance, our recruiting and retention goals, internal equity and consistency, and other information it deems relevant. The Compensation Committee believes that in the biopharmaceutical/biotechnology industry, stock option and/or other equity awards are a primary motivator in attracting and retaining executives, in addition to salary and cash incentive bonuses.

The primary components of our compensation package are described in more detail below.

Base Salary

We provide base salaries for our NEOs to compensate them for their services rendered during the fiscal year. Base salaries for our NEOs have been established based on their position and scope of responsibilities, their prior experience and training, and competitive market compensation data we review for similar positions in our industry.

Base salaries are reviewed periodically and may be increased for merit reasons based on the executive's performance, for retention reasons or if the base salary is not competitive with salaries paid by comparative companies for similar positions. Additionally, we may adjust base salaries throughout the year for promotions or other changes in the scope or breadth of an executive's role or responsibilities. We may also adjust base salaries downward based on a review of base salaries among our peer group. The NEOs' annual base salaries for 2015 and 2016 effective as of March 1 of each year were as follows:

Name	2015	2016	Percentage Increase
Derek A. Small	\$ 420,000	\$ 450,000	7.14%
David J. Barrett	360,000	373,100	3.50%
Richard J. Colonna, Ph.D.	—	380,000	—
Miguel S. Barbosa, Ph.D.	—	380,000	—
Thomas E. Rollins	—	360,000	—

Mr. Small received a 7.14% increase based upon his personal performance, the Company's performance and to make his base salary more competitive with compensation paid to CEOs at comparable companies, including our peer group. Mr. Barrett received a 3.5% increase based upon his personal performance, the Company's performance and to make his base salary more competitive with compensation paid to COO/CFOs at comparable companies, including our peer group.

Annual Performance-Based Cash Bonus

A significant element of the cash compensation of our NEOs is an annual performance-based cash bonus to reward strong performance and retain our NEOs in a competitive labor market. These bonuses reward our NEOs for achieving or exceeding our shorter-term corporate goals, which are designed to be met within a calendar year, and provide additional incentive to achieve these goals. Each of our NEOs is eligible for a target bonus, which is set as a percentage of his annual base salary. The Compensation Committee determines these target bonus percentages based largely on the range of target bonus percentages for similar positions at companies in our peer group, and our Compensation Committee periodically reviews and evaluates our NEOs' target bonus percentages as compared to our peers.

Bonuses are earned based on the achievement of significant company goals, including research and clinical development, financial, business development and operational milestones, with specific goals tailored to the executive officers' areas of responsibility. The performance goals generally are determined by our Compensation Committee in the first quarter of the calendar year and approved by the Board, but the actual bonus amounts are determined after the end of the performance period in the first quarter of the following year based on achievement of the pre-determined performance goals. The Board or the Compensation Committee may increase or decrease an executive's bonus payment (above or below the target percentage) based on its assessment of the Company's performance and each executive's individual performance during a given year. For 2016, annual bonuses were based on achievement of Company goals related to development of

TABLE OF CONTENTS

our HBV and Microbiome programs, including research and development goals, financial operations/investor relations and business development, including third-party collaborations, such as:

- Advance both HBV and Microbiome candidates toward clinical trials;
- Advance secondary indication for the Microbiome program;
- Expand our HBV pipeline by identifying second generation core protein Allosteric Modulators (CpAMs); and
- Complete collaboration with an external company to fund research and development of at least one program.

In determining the amounts to be paid under our performance-based cash bonus program, each officer's potential bonus was weighted differently, depending on his respective area of responsibility and contributions to achieving our corporate goals. For the business and financial executive positions, the Compensation Committee determined that Messrs. Small and Barrett were generally considered to have met their goals. For the science/technical executive positions, Drs. Colonno and Barbosa, and Mr. Rollins were considered to have performed well in pursuit of the corporate, research and development objectives.

Long-term Equity Incentive Awards

Our equity-based long-term incentive program is designed to align our NEOs' long-term incentives with stockholder value creation. We believe that long-term participation by our executive officers in equity-based awards is a critical factor in the achievement of long-term company goals and business objectives. In approving equity awards, the Compensation Committee's and the Board's guiding principle is to create a program that is designed to incentivize management to (i) generate a significant increase in total stockholder return as measured by sustained increases in our stock price and (ii) retain skilled employees. In furtherance of these objectives, stock option awards to NEOs and other executives and employees are a critical component of the Company's compensation practices. Because employees are able to profit from stock options only if our stock price increases relative to the stock option's exercise price, we believe stock options provide meaningful incentives to employees to achieve increases in the value of our stock over time.

Awards to our executive officers other than our CEO are recommended by the CEO and finalized by the Compensation Committee. Grants of awards to our CEO are decided upon and made by the Compensation Committee.

In determining the size of a stock option grant, the Compensation Committee takes into account negotiations with newly hired executives, individual and Company performance, internal pay equity considerations and the value of existing long-term equity incentive awards.

In July 2014, we cancelled all outstanding options issued under our 2006 Equity Incentive Plan and substantially all outstanding options and unvested restricted stock units issued under our 2010 Equity Incentive Plan. At the same time, our Board and our stockholders adopted and approved our 2014 Stock Incentive Plan and we granted Mr. Barrett an option to purchase 741,800 shares of common stock. No options were granted to Mr. Small because we assumed options to purchase an aggregate of 466,238 shares of common stock previously granted to him by Assembly Pharmaceuticals, Inc. in the Merger.

In 2015 and 2016, no equity awards were made to Mr. Small or Mr. Barrett in light of their existing awards. Each of Mr. Rollins and Drs. Colonno and Barbosa received new hire grants in 2016 of options to purchase 125,000 shares of common stock, 200,000 shares of common stock and 190,000 shares of common stock, respectively. Options granted to new hires in 2016 vest over four years subject to continued service. We believe this vesting schedule encourages long-term employment with Assembly, while allowing our executives to realize compensation in line with the value they have created for our stockholders.

Other Compensation

We maintain broad-based benefits and perquisites that are provided to all eligible employees on the same terms, including health insurance, life and disability insurance, dental insurance and paid time off (PTO).

TABLE OF CONTENTS

Executive Compensation Policies

Deductibility of Executive Compensation

Section 162(m) prohibits publicly held corporations from deducting more than \$1 million per year in compensation paid to the chief executive officer and each of the three other NEOs (other than the chief financial officer) in any taxable year. Generally, compensation in excess of \$1 million may only be deducted if it is “performance-based compensation” within the meaning of the Section 162(m) and meets certain other requirements set forth in Section 162(m).

In approving the amount and form of compensation for our executive officers, our Compensation Committee is mindful of the benefit of receiving full deductibility of compensation; however, our Compensation Committee believes that we should not be constrained by the requirements of Section 162(m), where such requirements would impair our flexibility in compensating our executive officers in a manner that can best promote our corporate objectives and attract and retain executive talent. Our Compensation Committee monitors the application of Section 162(m) and balances the benefits of potentially paying compensation that is deductible under Section 162(m) with our need to have the flexibility to maintain compensation plans that are designed to promote our objectives.

Sections 280G and 4999

Sections 280G and 4999 of the Internal Revenue Code of 1986, as amended (the Code), provide that executive officers and directors who hold significant equity interests and certain other service providers may be subject to significant additional taxes if they receive payments or benefits in connection with a change in control that exceeds certain prescribed limits, and that the Company (or a successor) may forfeit a deduction on the amounts subject to this additional tax. We have not agreed to provide any executive officer, including any NEOs, with a “gross-up” or other reimbursement payment for any tax liability that the executive officer might owe as a result of the application of Sections 280G or 4999 of the Code.

Hedging and Pledging Policy

Under our Special Trading Procedures for Insiders, which was adopted as an addendum to our Statement of Company Policy on Insider Trading and Disclosure, insiders, including NEOs, are prohibited from selling our securities “short” at any time. In addition, unless the transaction has been approved by the Audit Committee, insiders, including NEOs, may not at any time (i) buy or sell puts, calls or similar instruments on our securities, (ii) engage in any other hedging transaction with respect to the Company’s securities or (iii) pledge our stock as collateral for a loan. None of our NEOs have pledged our stock. Insiders, including our NEOs, may not hold our stock in a margin account.

Compensation Committee Report

Management has prepared the Compensation Discussion and Analysis, beginning on page [38](#). The Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis with management. Based on this review and discussion, the Compensation Committee recommended to the Board of Directors that the Compensation Discussion and Analysis be included in this proxy statement.

Submitted The Compensation Committee
by: Myron Z. Holubiak, Chairman
 Mark Auerbach
 William R. Ringo, Jr.

[TABLE OF CONTENTS](#)**Summary Compensation Table**

The following table sets forth all compensation earned in the fiscal years ended December 31, 2016, 2015 and 2014 by our Named Executive Officers.

Name and Principal Position	Year	Salary (\$)⁽¹⁾	Bonus (\$)⁽²⁾	Option Awards (\$)⁽³⁾	Non-Equity Incentive Plan Compensation (\$)⁽⁴⁾	Total (\$)
Derek A. Small ⁽⁵⁾	2016	445,400	—	—	213,750	659,150
<i>President and Chief Executive Officer</i>	2015	415,696	—	—	204,750	620,446
	2014	160,416	150,000	—	116,667	427,083
David J. Barrett ⁽⁶⁾	2016	401,137	—	—	177,300	578,437
<i>Chief Financial Officer and Chief Operating Officer</i>	2015	363,346	—	—	180,250	543,596
	2014	299,358	—	4,373,237	150,000	4,822,595
Richard J. Colonno, Ph.D. ⁽⁷⁾						
<i>Chief Scientific Officer</i>	2016	377,320	75,000	1,055,948	125,000	1,633,268
Miguel S. Barbosa, Ph.D. ⁽⁸⁾						
<i>Chief Scientific Officer of Microbiome Program and Head of Microbiome Program</i>	2016	102,308	—	1,138,796	50,000	1,291,104
Thomas E. Rollins ⁽⁹⁾						
<i>Chief Development Officer</i>	2016	351,923	—	612,997	92,000	1,056,920

-
- (1) The reported amounts include the following information for accrued and unused PTO in accordance with the Company's PTO policy: (i) \$4,446 for Mr. Small in 2015; and (ii) \$30,136 and \$4,159 for Mr. Barrett in 2016 and 2015, respectively.
 - (2) The reported amounts represent a retention bonus paid to Mr. Small pursuant to the terms of his employment agreement and a signing bonus paid to Dr. Colonno pursuant to the terms of his employment agreement.
 - (3) The reported amounts represent the grant date fair value of the award, computed in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Notes 2 and 8 of the financial statements included in the Annual Report on Form 10-K for the year ended December 31, 2016.
 - (4) Non-equity incentive plan compensation represents amounts paid as annual performance awards. 2016 annual performance awards were paid in February 2017 based on the achievement of company performance goals and other factors deemed relevant by the Compensation Committee for the year ended December 31, 2016.
 - (5) Mr. Small became an employee on July 11, 2014. Mr. Small was named Chief Executive Officer on February 10, 2015. Mr. Small is not compensated for his service as a director of the Company.
 - (6) On February 10, 2015, Mr. Barrett assumed the role of Chief Operating Officer.
 - (7) On January 5, 2016, Dr. Colonno became an employee of the Company. In connection with his acceptance of the Company's offer of employment, Dr. Colonno received a signing bonus of \$75,000. His annualized base salary for 2016 was \$380,000.
 - (8) On September 26, 2016, Dr. Barbosa became an employee of the Company. His annualized base salary for 2016 was \$380,000.
 - (9) On January 11, 2016, Mr. Rollins became an employee of the Company. His annualized base salary for 2016 was \$360,000.

[TABLE OF CONTENTS](#)

Grants of Plan-Based Awards

The following table provides information for each of our NEOs regarding 2016 annual and long-term incentive award opportunities. Specifically, the table presents the 2016 grants of annual non-equity incentive awards and stock options. This table does not include annual grants of stock options made in March 2017.

Name	Grant Date	Estimated Future Payouts Under Non-Equity Incentive Plan Awards Target (\$)	All Other Option Awards: Number of Securities Underlying Options (#)	Exercise of Base Price of Option Awards (\$/Sh)	Grant Date Fair Value of Option Awards (\$) ⁽¹⁾
Derek A. Small	—	225,000	—	—	—
David J. Barrett	—	186,550	—	—	—
Richard J. Colonno, Ph.D.	—	131,542	—	—	—
	1/11/2016	—	200,000	7.03	1,055,948
Miguel S. Barbosa, Ph.D.	—	34,981	—	—	—
	9/26/2016	—	190,000	8.14	1,138,796
Thomas E. Rollins	—	122,548	—	—	—
	1/11/2016	—	76,492	7.03	406,495
	2/17/2016	—	48,508	6.36	206,502

(1) The reported amounts represent the grant date fair value of the award, computed in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Notes 2 and 8 of the financial statements included in the Form 10 K for the year ended December 31, 2016.

Outstanding Equity Awards at December 31, 2016

The following table contains certain information concerning outstanding equity awards held by the NEOs as of December 31, 2016. This table does not include annual grants of stock options made in March 2017.

Name	Option Awards			
	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date
Derek A. Small	453,287 ⁽¹⁾	12,952 ⁽¹⁾	2.22	5/15/2024
David J. Barrett	741,800	—	7.20	7/11/2024
Richard J. Colonno, Ph.D.	—	200,000 ⁽²⁾	7.03	1/11/2026
Miguel S. Barbosa, Ph.D.	—	190,000 ⁽³⁾	8.14	9/26/2026
Thomas E. Rollins	—	76,492 ⁽²⁾	7.03	1/11/2026
	—	8,245 ⁽²⁾	6.36	2/17/2026
	—	40,263 ⁽²⁾⁽⁴⁾	6.36	2/17/2016

- (1) These options were assumed in the Merger and vest over three years, with 1/36th of the shares vesting on a monthly basis beginning on February 2, 2014.
- (2) These options vest and become exercisable in four (4) equal annual installments from January 11, 2016, such that assuming continuous service the option shall be fully vested and exercisable on January 11, 2020. The vesting is subject to acceleration in connection with certain terminations of service.
- (3) These options vest and become exercisable in four (4) equal annual installments from September 26, 2016, such that, assuming continuous service, the option shall be fully vested and exercisable on September 26, 2020. The vesting is subject to acceleration in connection with certain terminations of service.

TABLE OF CONTENTS

- (4) The Compensation Committee approved the granting of these options effective as of February 17, 2016 subject to and contingent upon approval by the stockholders of the Company of an amendment to the 2014 Stock Incentive Plan. Such approval was received on June 2, 2016 at the Company's 2016 Annual Meeting of Stockholders.

Option Exercises and Stock Vested

No options held by NEOs were exercised during 2016, and no stock awards held by the NEOs vested during 2016.

Pension Benefits

We do not maintain any qualified or non-qualified defined benefit pension plans. As a result, none of our NEOs participates in or has account balances in qualified or non-qualified defined benefit plans sponsored by us.

Nonqualified Deferred Compensation

None of our NEOs participates in or has account balances in nonqualified defined contribution plans or other non-qualified deferred compensation plans maintained by us.

Employment Arrangements

All of our Named Executive Officers serve pursuant to an employment agreement.

Derek A. Small

In connection with the Merger in July 2014, the Company entered into an employment agreement with Mr. Small. Mr. Small's employment agreement had an initial term of two years and is subject to automatic extension for additional one-year periods unless we notify Mr. Small of the decision not to extend at least 180 days prior to the end of the term. Mr. Small's base salary in 2016 was \$450,000 (effective as of March 1) and his target bonus was 50% of his base salary. In March 2017, Mr. Small's annual base salary was increased to \$475,000, but his target bonus remained unchanged.

The Company has agreed to use its best efforts to cause Mr. Small to be elected as a voting member of the Board throughout the term of the employment agreement and shall include him in the slate for election as a director at every stockholders meeting during the term of the employment agreement at which his term as a director would otherwise expire. Mr. Small has agreed to accept such election and to serve as a member of the Board during the term of his employment without any additional compensation.

In the event Mr. Small is required to relocate from Indianapolis, Indiana, the Company shall for each of the first three 12 month periods following the Company's decision regarding Mr. Small's relocation, reimburse or pay to Mr. Small up to \$120,000 in cash for expenses incurred by Mr. Small to maintain a separate apartment in or near the city in which the Company's principal executive offices are located and to assist with commuting expenses to and from such principal executive offices.

If Mr. Small's employment agreement is terminated due to non-renewal of the agreement, Mr. Small is entitled to payment of any accrued and unpaid base salary through the termination date, accrued and unused PTO to the extent provided under the Company's paid time off policy or required by law and reimbursement of approved business expenses in accordance with the Company's expense reimbursement policy.

If Mr. Small's employment is terminated as a result of his death, then we will pay to his estate his then current base salary for a period of 12 months following such termination.

If Mr. Small's employment is terminated by the Company without cause (as defined in his employment agreement) and not by non-renewal of the term of the employment agreement or by Mr. Small for good reason (as defined in his employment agreement) within six months following a change of control (as defined in his employment agreement), and provided that Mr. Small signs and does not revoke a general release of claims against the Company, we will provide Mr. Small the following benefits: (i) a lump sum payment equal to 18 months of his then current base salary, (ii) an amount equal to his target annual bonus, (iii) immediate vesting in full of all equity awards held by Mr. Small, (iv) extension of the exercise period for all stock options held by Mr. Small to the end of their term, and (v) if Mr. Small properly elects COBRA,

TABLE OF CONTENTS

reimbursement of COBRA premiums for 18 months following termination or until the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

If Mr. Small's employment is terminated as a result of his disability (as defined in the employment agreement), by us without cause, or by Mr. Small for good reason and provided that Mr. Small signs and does not revoke a general release of claims against the Company, we will provide him the following benefits: (i) continued payment of his then base salary for 12 months following the date of termination of employment, (ii) immediate vesting in full of all equity awards held by Mr. Small that would have become vested during the 12 months following termination of employment, (iii) extension of the exercise period for all vested stock options held by Mr. Small to the end of their term, and (iv) if Mr. Small properly elects COBRA, reimbursement of his COBRA premiums for 12 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period. Such benefits are in lieu of, and not in addition to, the benefits described in the preceding paragraph.

Mr. Small's employment agreement includes non-solicitation and non-competition covenants that apply during the term of the employment agreement and for one year following the termination of his employment.

David J. Barrett

In January 2014, the Company entered into an employment agreement with Mr. Barrett. Mr. Barrett's employment agreement had an initial term of two years and is subject to automatic extension for additional one-year periods unless we notify him at least 180 days prior to the then current expiration date that we intend to not extend the employment agreement. Mr. Barrett's base salary in 2016 (effective as of March 1) was \$373,100, and his target bonus was 50% of his base salary. In March 2017, Mr. Barrett's base salary was increased to \$385,000, but his target bonus remained unchanged.

If Mr. Barrett's employment agreement is terminated due to non-renewal of the agreements, Mr. Barrett is entitled to payment of any accrued and unpaid base salary through the termination date and reimbursement of approved business expenses in accordance with our business expense reimbursement policy.

If Mr. Barrett's employment is terminated as a result of his death, then we will pay to his estate his then-current base salary for a period of 12 months following such termination.

If Mr. Barrett's employment is terminated by the Company in connection with, or within six months of, a change of control (as defined in his employment agreement) and provided that Mr. Barrett signs and does not revoke a general release of claims against the Company, we will provide him the following benefits: (i) a lump-sum payment equal to 18 months of his then-current base salary, (ii) an amount equal to his target annual bonus as established by the Board, (iii) immediate vesting in full of all equity awards held by Mr. Barrett, (iv) extension of the exercise period for all stock options held by Mr. Barrett to the end of their term, and (v) if Mr. Barrett properly elects COBRA, reimbursement of COBRA premiums for 18 months following termination or until the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

If Mr. Barrett's employment is terminated as a result of his disability (as defined in his employment agreement), by us without cause (as defined in his employment agreement), or by Mr. Barrett for good reason (as defined in his employment agreement) and provided that Mr. Barrett signs and does not revoke a general release of claims against the Company, we will provide him with the following benefits: (i) continued payment of his then-base salary for 12 months following the date of termination of employment, (ii) immediate vesting in full of all equity awards held by Mr. Barrett that would have become vested during the 12 months following termination of employment, (iii) extension of the exercise period for all vested stock options held by Mr. Barrett to the end of their term, and (iv) if Mr. Barrett properly elects COBRA, reimbursement of COBRA premiums for 12 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period. Such benefits are in lieu of, and not in addition to, the benefits described in the preceding paragraph.

TABLE OF CONTENTS

Mr. Barrett's employment agreement includes non-solicitation and non-competition covenants that apply during the term of the employment agreement and for one year following the termination of his employment.

Richard J. Colonno, Ph.D.

Effective January 5, 2016, the Company entered into an employment agreement with Dr. Colonno. The agreement has a term of five years and will be automatically extended for additional one-year periods unless the Company notifies Dr. Colonno at least 180 days prior to the then current expiration date that it intends to not extend the employment agreement. Dr. Colonno's base salary in 2016 was \$380,000, and his target bonus was 35% of his base salary. In March 2017, Dr. Colonno's base salary was increased to \$391,000, and his target bonus was increased to 40% of his base salary. Dr. Colonno received a signing bonus after 30 days of employment in the amount of \$75,000 that was subject to repayment in the event his employment terminated for certain reasons prior to January 5, 2017.

If Dr. Colonno's employment agreement is terminated due to non-renewal of the agreement, Dr. Colonno is entitled to payment of any accrued and unpaid base salary through the termination date, accrued and unused PTO to the extent provided under the Company's paid time off policy or required by law and reimbursement of approved business expenses in accordance with the Company's expense reimbursement policy.

If Dr. Colonno's employment is terminated as a result of his death, then we will pay to his estate his then current base salary for a period of 12 months following such termination.

If Dr. Colonno's employment is terminated by the Company without cause (as defined in his employment agreement) and not by non-renewal of the term of the employment agreement or by Dr. Colonno for good reason (as defined in his employment agreement) within six months following a change of control (as defined in his employment agreement), and provided that Dr. Colonno signs and does not revoke a general release of claims against the Company, we will provide Dr. Colonno the following benefits: (i) a lump sum payment equal to 18 months of his then current base salary, (ii) an amount equal to his target annual bonus, (iii) immediate vesting in full of all equity awards held by Dr. Colonno, (iv) extension of the exercise period for all stock options held by Dr. Colonno to the end of their term, and (v) if Dr. Colonno properly elects COBRA, reimbursement of COBRA premiums for 18 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

If Dr. Colonno's employment is terminated as a result of his disability (as defined in his employment agreement), by us without cause, or by Dr. Colonno for good reason and provided that Dr. Colonno signs and does not revoke a general release of claims against the Company, we will provide him the following benefits: (i) continued payment of his then base salary for 12 months following date of termination of employment, (ii) immediate vesting in full of all equity awards held by Dr. Colonno that would have become vested during the 12 months following termination of employment, (iii) extension of the exercise period for all vested stock options held by Dr. Colonno to the end of their term, and (iv) if Dr. Colonno properly elects COBRA, reimbursement of COBRA premiums for 12 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period. Such benefits are in lieu of, and not in addition to, the benefits described in the preceding paragraph.

Dr. Colonno's employment agreement includes non-solicitation covenants that apply during the term of the employment agreement and for one year following the termination of his employment.

Miguel S. Barbosa, Ph.D.

Effective September 26, 2016, the Company entered into an employment agreement with Dr. Barbosa. The agreement provides for an at-will employment arrangement. Dr. Barbosa's base salary in 2016 was \$380,000, and his target bonus was 35% of his base salary. In March 2017, Dr. Barbosa's base salary was increased to \$383,000, and his target bonus was increased to 40% of his base salary. Dr. Barbosa is also eligible to receive, for up to 12 months following the effective date of his employment agreement, a commuting allowance of up to \$75,000 and, during the 24 months following the effective date of his employment agreement, reimbursement of up to \$100,000 for relocation expenses incurred by him. Relocation

TABLE OF CONTENTS

expenses actually reimbursed shall be repaid to the Company in the event Dr. Barbosa resigns from the Company prior to the first anniversary of the effective date.

If Dr. Barbosa's employment is terminated as a result of his death, then we will pay to his estate his then current base salary for a period of 12 months following such termination.

If Dr. Barbosa's employment is terminated by the Company without cause (as defined in his employment agreement) or by Dr. Barbosa for good reason (as defined in his employment agreement) within six months following, a change of control (as defined in his employment agreement), and provided that Dr. Barbosa signs and does not revoke a general release of claims against the Company, we will provide Dr. Barbosa the following benefits: (i) a lump sum payment equal to 18 months of his then current base salary, (ii) an amount equal to his target annual bonus, (iii) immediate vesting in full of all equity awards held by Dr. Barbosa, (iv) extension of the exercise period for all stock options held by Dr. Barbosa to the end of their term, and (v) if Dr. Barbosa properly elects COBRA, reimbursement of COBRA premiums for 18 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

If Dr. Barbosa's employment is terminated as a result of his disability (as defined in his employment agreement), by us without cause, or by Dr. Barbosa for good reason and provided that Dr. Barbosa signs and does not revoke a general release of claims against the Company, we will provide him the following benefits: (i) continued payment of his then base salary for 12 months following date of termination of employment, (ii) immediate vesting in full of all equity awards held by Dr. Barbosa that would have become vested during the 12 months following termination of employment, (iii) extension of the exercise period for all vested stock options held by Dr. Barbosa to the end of their term, and (iv) if Dr. Barbosa properly elects COBRA, reimbursement of COBRA premiums for 12 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period. Such benefits are in lieu of, and not in addition to, the benefits described in the preceding paragraph.

Dr. Barbosa's employment agreement includes non-solicitation covenants that apply during the term of the employment agreement and for one year following the termination of his employment.

Thomas E. Rollins

Effective January 9, 2016, we entered into an offer letter with Mr. Rollins. Mr. Rollins's offer letter provides for an at-will employment arrangement. Mr. Rollins's base salary in 2016 was \$360,000, and his target bonus was 35% of his base salary. In March 2017, Mr. Rollins's base salary was increased to \$370,500, and his target bonus remained unchanged.

If we terminate Mr. Rollins's employment without cause (as defined in his offer letter) and provided that Mr. Rollins signs and does not revoke a general release of claims against the Company, we will provide Mr. Rollins with the following benefits: (i) the continued payment of his then-current base salary for a period of 12 months following the date of termination of employment (if such termination occurs upon, or within six months following a change in control (as defined in Mr. Rollins's offer letter), we shall also pay Mr. Rollins a lump sum amount equal to his annual target bonus; (ii) all equity awards held by Mr. Rollins that would have become vested during the twelve months following termination of employment shall accelerate and vest (provided, that if such termination occurs within the six month period after a change in control, all of the time — based equity awards held by Mr. Rollins will become immediately vested); (iii) the extension of the exercise period for all vested options held by Mr. Rollins to the end of their term; and (iv) provided that Mr. Rollins properly elects COBRA, reimbursement of COBRA premiums for 12 months following termination or the end of his COBRA continuation period, whichever is earlier; provided, however, the Company's obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

In connection with the execution of his offer letter, Mr. Rollins executed a Proprietary Information and Inventions Agreement, which includes non-solicitation and non-competition covenants that apply during the term of his employment and for one year following the termination of his employment.

TABLE OF CONTENTS

Potential Payments Upon Employment Termination or Change of Control

The information below describes and quantifies certain compensation that would have become payable under employment agreements or offer letters with our NEOs if their employment with us had been terminated as of December 31, 2016. Due to the number of factors that affect the nature and amount of any benefits provided upon the events discussed below, any actual amounts paid or distributed upon a termination or change of control may be different. Factors that could affect these amounts include the timing during the year of any such event.

Name	Termination Without Cause Other Than Within Six Months Following a Change of Control (\$)	Termination for Good Reason by Executive Other Than Within Six Months Following a Change of Control (\$)	Disability (\$)	Death (\$)	Termination Without Cause or for Good Reason Within Six Months Following a Change of Control (\$)
Derek A. Small					
Cash Severance	450,000	450,000	450,000	450,000	900,000
Continuation of Benefits	16,879	16,879	16,879	—	25,319
Equity Acceleration ⁽¹⁾	128,613	128,613	128,613	—	128,613
David J. Barrett					
Cash Severance	373,100	373,100	373,100	373,100	746,200
Continuation of Benefits	26,238	26,238	26,238	—	39,357
Equity Acceleration ⁽¹⁾	—	—	—	—	—
Richard J. Colonno, Ph.D.					
Cash Severance	380,000	380,000	380,000	380,000	703,000
Continuation of Benefits	6,909	6,909	6,909	—	10,363
Equity Acceleration ⁽¹⁾	256,000	256,000	256,000	—	1,024,000
Miguel S. Barbosa, Ph.D.					
Cash Severance	380,000	380,000	380,000	380,000	703,000
Continuation of Benefits	—	—	—	—	—
Equity Acceleration ⁽¹⁾	190,475	190,475	190,475	—	761,900
Thomas E. Rollins					
Cash Severance	360,000	—	—	—	486,000
Continuation of Benefits	17,592	—	—	—	17,592
Equity Acceleration ⁽¹⁾	168,125	—	—	—	672,500

(1) Reflects the accelerated value of all outstanding equity awards that would accelerate on the closing price of our stock on the NASDAQ Capital Market on December 30, 2016, the last trading day of the year, which was \$12.15 per share. This represents the in-the-money value of accelerated stock options as of December 31, 2016.

Stockholder Engagement

Senior management regularly engages with our stockholders at industry conferences and investor meetings. In response to feedback gained through our engagement program, we remain focused on delivering on our growth strategy, and we continue to enhance the transparency and disclosure of our financial, operational and environmental and governance performance.

Our investor relations team keeps the board regularly updated on the views of stockholders as well as provides reports from investor relations advisers concerning institutional shareholder feedback.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The written charter of our Audit Committee authorizes and the NASDAQ Stock Market Rules require our Audit Committee to review and approve related party transactions. In reviewing related party transactions, our Audit Committee applies the basic standard that transactions with affiliates should be made on terms no less favorable to us than could have been obtained from unaffiliated parties. Therefore, the Audit Committee reviews the benefits of the transactions, terms of the transactions and the terms available from unrelated third parties, as applicable. All transactions other than compensatory arrangements between us and our officers, directors, principal stockholders and their affiliates will be approved or ratified by our Audit Committee or a majority of the disinterested directors, and will continue to be on terms no less favorable to us than could be obtained from unaffiliated third parties.

Other than the compensation agreements and other arrangements described under “Executive Officers” and the transactions described below, since January 1, 2016, there has not been and there is not currently proposed, any transaction or series of similar transactions to which we were, or will be, a party in which the amount involved exceeded, or will exceed, \$120,000 and in which any director, executive officer, holder of five percent or more of any class of our capital stock or any member of the immediate family of, or entities affiliated with, any of the foregoing persons, had, or will have, a direct or indirect material interest.

Extension of Sponsored Research Agreement with Indiana University

Assembly is a party to a Research Agreement dated August 5, 2014 with The Trustees of Indiana University (the Research Agreement), pursuant to which Indiana University, under the direction of Dr. Adam Zlotnick, an advisor to the Company and an owner of approximately 8.2% of Assembly’s common stock, conducts research activities in connection with the research proposal entitled “Development of HBV Core Proteins Allosteric Modulators.” By agreement dated October 28, 2014, the term of the Research Agreement was extended until August 31, 2015 in consideration for aggregate payments to Indiana University during the term of \$424,099. In September 2015, the term of the research program was further extended until August 31, 2017 and provided for aggregate payments to Indiana University through the end of the term of approximately \$724,198. Our Audit Committee has determined, based on currently available information, that Dr. Zlotnick may be deemed to have an indirect interest in these payments due to his supervision of the research funded by the Company under the Research Agreement, and has reviewed and ratified the Research Agreement and the extensions thereto in accordance with the Audit Committee Charter.

SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Pursuant to Section 16(a) of the Securities Exchange Act, our directors and executive officers are required to file reports with the SEC indicating their holdings of and transactions in our equity securities. To our knowledge, based solely on our review of the copies of such reports furnished to us and written representations, our officers, directors and holders of more than 10% of our common stock complied with all applicable filing requirements during the fiscal year ended December 31, 2016.

DEADLINE FOR STOCKHOLDER PROPOSALS FOR 2018 ANNUAL MEETING

Stockholders having proposals that they desire to present at next year’s annual meeting of our stockholders should, if they desire that such proposals be included in our proxy statement relating to such meeting, submit such proposals in time to be received by us not later than December 22, 2017. To be so included, all such submissions must comply with the requirements of Rule 14a-8 promulgated under the Securities Exchange Act and we direct your close attention to that rule. Proposals should be mailed to the Corporate Secretary, 11711 N. Meridian Street, Suite 310, Carmel, IN 46032.

OTHER MATTERS

The Board knows of no other business to be brought before the meeting, but intends that, as to any such other business, the shares will be voted pursuant to the proxy in accordance with the best judgment of the person or persons acting thereunder.



assembly
biosciences

www.assemblybio.com

**ASSEMBLY BIOSCIENCES, INC.
11711 N. MERIDIAN ST, SUITE 310
CARMEL, IN 46032**

VOTE BY INTERNET - www.proxyvote.com

Use the Internet to transmit your voting instructions and for electronic delivery of information up until 11:59 P.M. Eastern Time the day before the meeting date. Have your proxy card in hand when you access the web site and follow the instructions to obtain your records and to create an electronic voting instruction form.

ELECTRONIC DELIVERY OF FUTURE PROXY MATERIALS

If you would like to reduce the costs incurred by our company in mailing proxy materials, you can consent to receiving all future proxy statements, proxy cards and annual reports electronically via e-mail or the Internet. To sign up for electronic delivery, please follow the instructions above to vote using the Internet and, when prompted, indicate that you agree to receive or access proxy materials electronically in future years.

VOTE BY PHONE - 1-800-690-6903

Use any touch-tone telephone to transmit your voting instructions up until 11:59 P.M. Eastern Time the day before the meeting date. Have your proxy card in hand when you call and then follow the instructions.

VOTE BY MAIL

Mark, sign and date your proxy card and return it by May 31, 2017 in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717.

TO VOTE, MARK BLOCKS BELOW IN BLUE OR BLACK INK AS FOLLOWS:

E27242-P88434

KEEP THIS PORTION FOR YOUR RECORDS
DETACH AND RETURN THIS PORTION ONLY

THIS PROXY CARD IS VALID ONLY WHEN SIGNED AND DATED.

ASSEMBLY BIOSCIENCES, INC.

The Board of Directors recommends you vote FOR the following:

1. Election of Directors

For All Withhold All For All Except

To withhold authority to vote for any individual nominee(s), mark "For All Except" and write the number(s) of the nominee(s) on the line below.

Nominees:

- | | |
|-----------------------------|---------------------------|
| 01) Anthony E. Altig | 05) William R. Ringo, Jr. |
| 02) Mark Auerbach | 06) Alan J. Lewis, Ph.D. |
| 03) Richard DiMarchi, Ph.D. | 07) Derek A. Small |
| 04) Myron Z. Holubiak | |

The Board of Directors recommends you vote FOR proposals 2 and 3.

For Against Abstain

2. To approve a non-binding, advisory resolution approving the compensation of the Company's named executive officers.

3. To ratify the selection of Ernst & Young LLP as the Company's independent registered public accounting firm for the Company's fiscal year ending December 31, 2017.

NOTE: Your proxy holder will also vote in their discretion upon such other matters that may properly come before the meeting or any adjournment thereof.

Please sign exactly as your name(s) appear(s) hereon. When signing as attorney, executor, administrator, or other fiduciary, please give full title as such. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by authorized officer.

Signature [PLEASE SIGN WITHIN BOX]	Date

Signature (Joint Owners)	Date

Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting:

The Notice & Proxy Statement, Annual Report on Form 10-K and Proxy Card are available at www.proxyvote.com.

E27243-P88434

**ASSEMBLY BIOSCIENCES, INC.
Annual Meeting of Stockholders
June 1, 2017 9:00 AM EDT
This proxy is solicited by the Board of Directors**

The Stockholder(s) hereby appoint(s) Derek A. Small and David J. Barrett, or either of them, as proxies, each with the power to appoint his substitute, and hereby authorize(s) each of them to represent and to vote, as designated on the reverse side of this ballot, all of the shares of common stock of ASSEMBLY BIOSCIENCES, INC. that the Stockholder(s) is/are entitled to vote at the Annual Meeting of Stockholders to be held at 9:00 AM EDT on June 1, 2017, at the Company's offices located at 11711 N. Meridian Street, Suite 310, Carmel, IN 46032 and any adjournment or postponement thereof.

This proxy, when properly executed, will be voted in the manner directed herein. If no such direction is made, this proxy will be voted in accordance with the Board of Directors' recommendations.

Continued and to be signed on reverse side

V.1.1