

**SCHEDULE 14A INFORMATION**

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

Filed by the Registrant

Filed by a Party other than the Registrant

Check the appropriate box:

- Preliminary Proxy Statement
- Confidential, for Use of the Commission Only (as permitted by Rule 14-6(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, Indiana 46032

**NOTICE OF ANNUAL MEETING OF STOCKHOLDERS  
To Be Held Wednesday, May 30, 2018**

April 19, 2018

**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 Wednesday, May 30, 2018, at 8:00 a.m. Eastern Daylight Time (EDT) for the following purposes:

1. To elect the nine nominees named in the attached proxy statement to the Board of Directors;
2. To approve, on a non-binding advisory basis, our named executive officers' compensation, as disclosed in the proxy statement accompanying this notice;
3. To vote, on a non-binding advisory basis, on the frequency of future advisory votes to approve our named executive officers' compensation;
4. To ratify the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018;
5. To amend and restate our Third Amended and Restated Certificate of Incorporation, as amended, to increase the authorized number of shares of common stock from 50,000,000 to 100,000,000;
6. To approve the Assembly Biosciences, Inc. 2018 Stock Incentive Plan;
7. To approve the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan; and
8. To vote on such other matters that may properly come before the meeting and any adjournment or postponement 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 5, 2018 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.

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 16, 2018 to submit your vote by mail. If you attend the Annual Meeting and file with our Corporate Secretary 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 Wednesday, May 30, 2018 at 8:00 a.m. EDT at Assembly's offices located at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 46032.**

**The Proxy Statement and the annual report to stockholders on Form 10-K for the fiscal year ending December 31, 2017 are available at: [www.proxyvote.com](http://www.proxyvote.com).**

We hope that you will attend the meeting in person on May 30, 2018, 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

**You are cordially invited to attend the Annual Meeting in person. Whether or not you expect to attend the Annual 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 to ensure your representation at the Annual Meeting. Even if you have voted by proxy, you may still vote in person if you attend the Annual 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 Annual 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, Indiana 46032**

**PROXY STATEMENT**  
**FOR THE 2018 ANNUAL MEETING OF STOCKHOLDERS**

**MAY 30, 2018**

**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 2018 Annual Meeting of Stockholders (the Annual Meeting) to be held at our offices at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 46032, at 8:00 a.m. (EDT) on Wednesday, May 30, 2018, 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 19, 2018 to our stockholders of record and beneficial owners as of April 5, 2018, the record date for the meeting. The proxy materials, including this proxy statement, proxy card or voting instruction card and our 2017 Annual Report on Form 10-K are being distributed and made available on or about April 19, 2018. 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

	<u>Page</u>
<a href="#"><u>Questions and Answers About These Proxy Materials and Voting</u></a>	<a href="#"><u>1</u></a>
<a href="#"><u>Proposal No. 1: Election of Directors</u></a>	<a href="#"><u>10</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>10</u></a>
<a href="#"><u>Nominees for Director</u></a>	<a href="#"><u>10</u></a>
<a href="#"><u>Required Vote</u></a>	<a href="#"><u>18</u></a>
<a href="#"><u>Recommendation of the Board of Directors</u></a>	<a href="#"><u>18</u></a>
<a href="#"><u>The Board of Directors and Corporate Governance</u></a>	<a href="#"><u>19</u></a>
<a href="#"><u>Meetings of the Board</u></a>	<a href="#"><u>19</u></a>
<a href="#"><u>Board Composition</u></a>	<a href="#"><u>19</u></a>
<a href="#"><u>Independence of Directors</u></a>	<a href="#"><u>20</u></a>
<a href="#"><u>Board Leadership Structure</u></a>	<a href="#"><u>20</u></a>
<a href="#"><u>Risk Oversight</u></a>	<a href="#"><u>20</u></a>
<a href="#"><u>Board Committees</u></a>	<a href="#"><u>20</u></a>
<a href="#"><u>Audit Committee</u></a>	<a href="#"><u>21</u></a>
<a href="#"><u>Compensation Committee</u></a>	<a href="#"><u>22</u></a>
<a href="#"><u>Nominating and Governance Committee</u></a>	<a href="#"><u>23</u></a>
<a href="#"><u>Science and Technology Committee</u></a>	<a href="#"><u>24</u></a>
<a href="#"><u>Code of Ethics</u></a>	<a href="#"><u>24</u></a>
<a href="#"><u>Director Compensation</u></a>	<a href="#"><u>24</u></a>
<a href="#"><u>Stockholder Communications</u></a>	<a href="#"><u>26</u></a>
<a href="#"><u>Stockholder Engagement</u></a>	<a href="#"><u>26</u></a>
<a href="#"><u>Proposal No. 2: Advisory Vote to Approve Our Named Executive Officers' Compensation</u></a>	<a href="#"><u>27</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>27</u></a>
<a href="#"><u>Required Vote</u></a>	<a href="#"><u>27</u></a>
<a href="#"><u>Recommendation of the Board of Directors</u></a>	<a href="#"><u>28</u></a>
<a href="#"><u>Proposal No. 3: Advisory Vote on the Frequency of Future Advisory Votes on Our Named Executive Officers' Compensation</u></a>	<a href="#"><u>29</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>29</u></a>
<a href="#"><u>Required Vote</u></a>	<a href="#"><u>29</u></a>
<a href="#"><u>Recommendation of the Board of Directors</u></a>	<a href="#"><u>29</u></a>
<a href="#"><u>Matters Relating to Our Independent Registered Public Accounting Firm</u></a>	<a href="#"><u>30</u></a>
<a href="#"><u>Pre-Approval Policies and Procedures</u></a>	<a href="#"><u>30</u></a>
<a href="#"><u>Fees and Services</u></a>	<a href="#"><u>30</u></a>
<a href="#"><u>Report of the Audit Committee of the Board of Directors</u></a>	<a href="#"><u>30</u></a>
<a href="#"><u>Proposal No. 4: Ratification of the Selection of the Independent Registered Public Accounting Firm</u></a>	<a href="#"><u>32</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>32</u></a>
<a href="#"><u>Required Vote</u></a>	<a href="#"><u>32</u></a>
<a href="#"><u>Recommendation of the Board of Directors</u></a>	<a href="#"><u>32</u></a>
<a href="#"><u>Proposal No. 5: Amendment and Restatement of Our Certificate of Incorporation to Increase Shares of Authorized Common Stock</u></a>	<a href="#"><u>33</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>33</u></a>
<a href="#"><u>Purpose</u></a>	<a href="#"><u>33</u></a>
<a href="#"><u>Rights of Additional Authorized Shares</u></a>	<a href="#"><u>34</u></a>
<a href="#"><u>Potential Adverse Effects of the Amendment</u></a>	<a href="#"><u>34</u></a>
<a href="#"><u>Required Vote</u></a>	<a href="#"><u>34</u></a>
<a href="#"><u>Recommendation of the Board of Directors</u></a>	<a href="#"><u>34</u></a>
<a href="#"><u>Proposal No. 6: Approval of the Assembly Biosciences, Inc. 2018 Stock Incentive Plan</u></a>	<a href="#"><u>35</u></a>
<a href="#"><u>General</u></a>	<a href="#"><u>35</u></a>
<a href="#"><u>Purpose</u></a>	<a href="#"><u>35</u></a>
<a href="#"><u>Rationale</u></a>	<a href="#"><u>35</u></a>

	<u>Page</u>
<a href="#">Material Terms of the 2018 Plan</a>	36
<a href="#">Eligibility</a>	41
<a href="#">New Plan Benefits</a>	41
<a href="#">Equity Plans</a>	41
<a href="#">Required Vote</a>	42
<a href="#">Recommendation of the Board of Directors</a>	42
<a href="#">Proposal No. 7: Approval of the 2018 Employee Stock Purchase Plan</a>	43
<a href="#">General</a>	43
<a href="#">Purpose</a>	43
<a href="#">Material Terms of the ESPP</a>	43
<a href="#">New Plan Benefits</a>	44
<a href="#">Summary of Federal Income Tax Consequences</a>	44
<a href="#">Required Vote</a>	45
<a href="#">Recommendation of the Board of Directors</a>	45
<a href="#">Executive Officers</a>	46
<a href="#">Executive Compensation</a>	48
<a href="#">Compensation Discussion and Analysis</a>	48
<a href="#">Compensation Philosophy and Overview</a>	48
<a href="#">Looking Ahead to 2018</a>	49
<a href="#">Annual Performance-Based Cash Bonuses</a>	49
<a href="#">Long-term Equity Incentive Awards</a>	49
<a href="#">Named Executive Officers</a>	49
<a href="#">Our Management Team's 2017 Accomplishments</a>	49
<a href="#">Independent Compensation Consultant</a>	50
<a href="#">Compensation Adjustments and Peer Group Process</a>	50
<a href="#">Components of our Executive Compensation Program</a>	52
<a href="#">Base Salary</a>	52
<a href="#">Annual Performance-Based Cash Bonus</a>	53
<a href="#">Long term Equity Incentive Awards</a>	54
<a href="#">Other Compensation</a>	55
<a href="#">Other Executive Compensation Policies</a>	55
<a href="#">Compensation Risk Assessment</a>	56
<a href="#">Summary Compensation Table</a>	56
<a href="#">Grants of Plan-Based Awards</a>	57
<a href="#">Outstanding Equity Awards at December 31, 2017</a>	58
<a href="#">Option Exercises and Stock Vested</a>	58
<a href="#">Pension Benefits</a>	58
<a href="#">Nonqualified Deferred Compensation</a>	58
<a href="#">Employment Arrangements</a>	59
<a href="#">Potential Payments Upon Employment Termination or Change of Control</a>	62
<a href="#">Compensation Committee Report</a>	63
<a href="#">CEO Pay Ratio</a>	63
<a href="#">Certain Relationships and Related Party Transactions</a>	65
<a href="#">Security Ownership of Certain Beneficial Owners and Management</a>	66
<a href="#">Section 16(a) Beneficial Ownership Reporting Compliance</a>	69
<a href="#">Deadline for Stockholder Proposals for the 2019 Annual Meeting of Stockholders</a>	69
<a href="#">Delivery of Documents to Stockholders Sharing an Address</a>	70
<a href="#">Other Matters</a>	70
<a href="#">Appendix A: Proposed Fourth Amended and Restated Certificate of Incorporation</a>	A-1
<a href="#">Appendix B: Assembly Biosciences, Inc. 2018 Stock Incentive Plan</a>	B-1
<a href="#">Appendix C: Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan</a>	C-1

## 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 (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 19, 2018 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 19, 2018 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 by email or over 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 by email or over 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 for 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](http://www.proxyvote.com) and enroll for online delivery of Annual Meeting and proxy 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](http://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 April 5, 2018 (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](mailto: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 5, 2018, will be entitled to vote at the Annual Meeting. On the Record Date, there were 20,429,400 shares of common stock outstanding and entitled to vote.

#### *Stockholder of Record: Shares Registered in Your Name*

If on April 5, 2018 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.

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

If on April 5, 2018 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 seven matters scheduled for a vote:

1. Election of nine directors;
2. Approval, on a non-binding advisory basis, of our named executive officers’ compensation, as disclosed in this proxy statement in accordance with SEC rules;
3. Vote, on a non-binding advisory basis, on the frequency of future advisory votes to approve our named executive officers’ compensation;
4. Ratification of the selection by the Audit Committee of the Board of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018;
5. Amendment and restatement of our Third Amended and Restated Certificate of Incorporation, as amended (our Certificate of Incorporation), to increase the authorized number of shares of common stock from 50,000,000 to 100,000,000;
6. Approval of the Assembly Biosciences, Inc. 2018 Stock Incentive Plan (the 2018 Plan); and
7. Approval of the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan (the ESPP).

**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 other than Proposal No. 3, you may vote “For” or “Against” or abstain from voting. For Proposal No. 3, you may vote for the frequency of “One Year,” “Two Years” or “Three Years” for future advisory votes on our named executive officers’ compensation, or you may 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, 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 over 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 29, 2018 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 your proxy card or Proxy Availability Notice. Your vote must be received by 11:59 p.m. EDT on May 29, 2018 to be counted.
- To vote over the Internet, go to [www.proxyvote.com](http://www.proxyvote.com) to complete an electronic proxy card. You will be asked to provide the company control number from your proxy card. Your vote must be received by 11:59 p.m. EDT on May 29, 2018 to be counted.

*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 29, 2018 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 your voting instruction form or Proxy Availability Notice. Your vote must be received by 11:59 p.m. EDT on May 29, 2018 to be counted.
- To vote over the Internet, go to [www.proxyvote.com](http://www.proxyvote.com) to complete an electronic proxy. You will be asked to provide the company control number from your voting instruction form. Your vote must be received by 11:59 p.m. EDT on May 29, 2018 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 5, 2018.

**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 over the Internet.
- You may send a timely written notice that you are revoking your proxy to our Corporate Secretary, at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 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.

### **How are votes counted?**

Votes will be counted by the inspector of election appointed for the meeting, who will separately count, (1) for the proposal to elect directors, votes “For,” “Withhold” and broker non-votes; (2) with respect to other proposals except for Proposal No. 3, votes “For” and “Against,” abstentions and, if applicable, broker non-votes; and (3) with respect to Proposal No. 3, votes for “One Year,” “Two Years” or “Three Years,” abstentions and broker non-votes. “Withhold” votes will have no effect and will not be counted towards the election of directors. With respect to other proposals, abstentions will be counted towards the vote total for each proposal, and will have the same effect as “Against” votes. Broker non-votes will be counted to determine whether a quorum is present at the Annual Meeting. Broker non-votes will have no effect and will not be counted towards the vote total for Proposal No. 1, Proposal No. 2, Proposal No. 3, Proposal No. 6 and Proposal No. 7. Broker non-votes will have the same effect as a vote “Against” Proposal No. 5.

### **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. The only “routine” matter on the agenda for the Annual Meeting is Proposal No. 4 — Ratification of the Selection of the Independent Registered Public Accounting Firm. Accordingly, the “non-routine” matters on the agenda for the Annual Meeting include Proposal No. 1 — Election of Directors, Proposal No. 2 — Advisory Vote to Approve Our Named Executive Officers’ Compensation, Proposal No. 3 — Advisory Vote on the Frequency of Future of the Advisory Votes to Approve Our Named Executive Officer Compensation, Proposal No. 5 — Amendment and Restatement of Our Certificate of Incorporation to Increase Shares of Authorized Common Stock, Proposal No. 6 — Approval of the Assembly Biosciences, Inc. 2018 Stock Incentive Plan and Proposal No. 7 — Approval of Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan.

Broker non-votes will be counted to determine 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, Proposal No. 2 — Advisory Vote to Approve Our Named Executive Officers’ Compensation, Proposal No. 3 — Advisory Vote on the Frequency of Future Advisory Votes to Approve Our Named Executive Officer Compensation, Proposal No. 6 — Approval of the Assembly Biosciences, Inc. 2018 Stock Incentive Plan or Proposal No. 7 — Approval of Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan. Broker non-votes will have the same effect as a vote “Against” Proposal No. 5 — Amendment and Restatement of Our Certificate of Incorporation to Increase Shares of Authorized Common Stock. 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 on any of the proposals listed above, 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 nine director nominees identified in this proxy statement;
- (2) FOR the approval, on an advisory basis, of our named executive officers’ compensation;
- (3) FOR every “ONE YEAR” on the frequency, on an advisory basis, of future advisory votes to approve our named executive officers’ compensation;
- (4) FOR the ratification of the selection of Ernst & Young LLP as our registered independent public accounting firm for the fiscal year ending December 31, 2018;
- (5) FOR the amendment and restatement of our Certificate of Incorporation to increase the number of authorized shares of common stock from 50,000,000 to 100,000,000;
- (6) FOR the approval of the 2018 Plan;
- (7) FOR the approval of the ESPP; and
- (8) 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 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 20,429,400 shares of common stock outstanding and entitled to vote. Thus, the holders of 10,214,701 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 29, 2018 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.

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:

<b>Proposal</b>	<b>Description</b>	<b>Vote Required</b>	<b>Discretionary Voting Allowed</b>
No. 1	Election of Nine Directors	Plurality	No
No. 2	Advisory Vote on Named Executive Officers' Compensation	Majority Present & Entitled to Vote	No
No. 3	Advisory Vote on the Frequency of Future Advisory Votes to Approve Our Named Executive Officers' Compensation	Largest Number of Affirmative Votes	No
No. 4	Ratification of the Selection of Ernst & Young LLP as Independent Registered Public Accounting Firm for 2018	Majority Present & Entitled to Vote	Yes
No. 5	Amendment and Restatement of Our Certificate of Incorporation to Increase the Authorized Number of Shares of Common Stock	Affirmative Vote of Majority of Outstanding Stock Entitled to Vote	No
No. 6	Approval of the 2018 Plan	Majority Present & Entitled to Vote	No
No. 7	Approval of the 2018 Employee Stock Purchase Plan	Majority Present & Entitled to Vote	No

The election of directors will be determined by a plurality of the votes cast at the Annual Meeting. This means that the nine nominees receiving the highest number of "FOR" votes will be elected as directors. "WITHHOLD" 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 votes: (1) to approve, on an advisory basis, our named executive officers' compensation; (2) to recommend, on an advisory basis, the frequency of stockholder future advisory votes to approve our named executive officers' compensation; (3) to ratify the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018; (4) to approve the 2018 Plan; and (5) to approve the ESPP, 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.

The vote to amend and restate our Certificate of Incorporation requires the affirmative vote of a majority of the shares outstanding and entitled to vote.

Accordingly, assuming a quorum is present:

- Proposal No. 1: For the election of directors, the nine 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. “WITHHOLD” 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 advisory approval of our named executive officers’ compensation. 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: The frequency — every one year, two years or three years — that receives the largest number of affirmative votes at the Annual Meeting will be deemed the stockholders’ advisory recommendation regarding the frequency of future advisory votes to approve our named executive officers’ compensation. Abstentions and broker non-votes will have no effect on the outcome of the vote to recommend the frequency of future advisory votes on our named executive officers’ compensation.
- Proposal No. 4: 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. 4 must be voted “FOR” the ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018. Abstentions will be deemed a vote against Proposal No. 4. Broker non-votes will not be considered towards vote totals on Proposal No. 4; however, the ratification of the selection of Ernst & Young LLP is a matter on which a broker, bank or other nominee has discretionary voting authority, so we do not expect any broker non-votes with respect to Proposal No. 4.
- Proposal No. 5: To be approved, a majority of the shares of common stock outstanding and entitled to vote on Proposal No. 5 must be affirmatively voted “FOR” the amendment and restatement of our Certificate of Incorporation. Abstentions and broker non-votes will each have the same effect as a vote against Proposal No. 5.
- Proposal No. 6: 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. 6 must be voted “FOR” approval of the 2018 Plan. Abstentions will be deemed a vote against Proposal No. 6. Broker non-votes will not be considered towards vote totals on Proposal No. 6.
- Proposal No. 7: 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. 7 must be voted “FOR” the approval of the ESPP. Abstentions will be deemed a vote against Proposal No. 7. Broker non-votes will not be considered towards vote totals on Proposal No. 7.

#### **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, 2017 are available free of charge at [www.proxyvote.com](http://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 our Corporate Secretary at [elizabeth@assemblybio.com](mailto: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, 2017 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, 2017, 2016 and 2015. The Annual Report on Form 10-K, without exhibits, is included in the 2017 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, 2017. 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 due to new information, future events or otherwise after the date of this proxy statement.

**PROPOSAL NO. 1: ELECTION OF DIRECTORS****General**

Our Amended and Restated 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 nine.

Our Board currently consists of nine directors. There are nine 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 or her 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, other than Susan Mahony, Ph.D. and Helen S. Kim, was previously elected by the stockholders. Dr. Mahony was appointed to the Board in December 2017 and Ms. Kim was appointed to the Board in March 2018. 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 nine 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 D. DiMarchi, Ph.D., Myron Z. Holubiak, Helen S. Kim, Alan J. Lewis, Ph.D., Susan Mahony, Ph.D., William R. Ringo, Jr. and Derek A. Small as a director of Assembly. The Board has determined that all of these directors, except for 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 4/5/18)</u>	<u>Director Since</u>	<u>Business Experience</u>
Anthony E. Altig	62	2012	Mr. Altig joined our Board in January 2012. From 2008 to December 2017, Mr. Altig was the Chief Financial Officer of Biotix Holdings, Inc., a company that manufactures microbiological consumables, which was acquired by Mettler Toledo in September 2017. 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 B.B.A. in business from the University of Hawaii at Manoa and is a Certified Public Accountant (inactive). Among other experiences, 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.



<u>Name</u>	<u>Age (as of 4/5/18)</u>	<u>Director Since</u>	<u>Business Experience</u>
Mark Auerbach	79	2010	<p>Mr. Auerbach joined 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 experiences, 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>

Name	Age (as of 4/5/18)	Director Since	Business Experience
Richard D. DiMarchi, Ph.D.	65	2014	<p>Dr. DiMarchi joined our Board in July 2014 upon the closing of the Assembly Pharmaceuticals, Inc. acquisition 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 from its inception in 2012 through the Merger. Dr. DiMarchi is a Cox Distinguished Professor of Biochemistry and Gill Chair in Biomolecular Sciences at Indiana University (but currently on leave of absence until January 2020) 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. (until it was acquired by Roche in 2010). Dr. DiMarchi was a founder of Calibrium LLC, which was acquired by Novo Nordisk in 2015 and advisor to Twilight Ventures. Dr. DiMarchi retired as Group Vice President at Eli Lilly &amp; 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<sup>®</sup> and to the commercial development of pharmaceutical products Humulin<sup>®</sup>, Humatrope<sup>®</sup>, Glucagon<sup>®</sup>, Xigris<sup>®</sup>, Forteo<sup>®</sup>, and Evista<sup>®</sup>. 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 experiences, 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>

Name	Age (as of 4/5/18)	Director Since	Business Experience
Myron Z. Holubiak	71	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. (NASDAQ: CTXR), a late stage drug development company focused on critical care drug products. From September 2014 until March 2016, Mr. Holubiak was the founder and Chief Executive Officer and President of Leonard-Meron Biosciences, Inc., which 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 was president of 1-800-DOCTORS, Inc., a private physician finder company, from May 2007 to January 2014 and a member of its board of directors until September 2017. Since July 2015, Mr. Holubiak also has been a member of the board of directors of bioAffinity Technologies, Inc., a private cancer screening and diagnostics company. From October 2012 until October 2014, Mr. Holubiak served as a director of Intellicell Biosciences, Inc., a publicly traded regenerative medicine company. From April 2013 to April 2015, Mr. Holubiak was 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 experiences, 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>

Name	Age (as of 4/5/18)	Director Since	Business Experience
Helen S. Kim	55	2018	<p>Ms. Kim joined our Board in March 2018. From November 2014 until January 2018, Ms. Kim served as executive vice president of business development at Kite Pharma, Inc. where she led all business and corporate development initiatives including its sale to Gilead in September 2017. From January 2012 to January 2014, Ms. Kim served as strategic advisor to NGM Biopharmaceuticals, Inc. and from August 2009 to January 2012, Ms. Kim served as chief business officer of NGM Biopharmaceuticals, Inc. Ms. Kim's additional industry experience includes executive positions at Kosan Biosciences, Affymax, Inc., Onyx Pharmaceuticals, Inc., Protein Design Labs, Inc. and Chiron Corporation. In addition to her industry experience, from August 2003 to November 2007, Ms. Kim served as chief program officer for the Gordon and Betty Moore Foundation. Currently, she serves as a director on the board of Exicure, Inc., a public company, and Peloton Therapeutics, Inc. Ms. Kim formerly served as a director and member of the audit committee of Sunesis Pharmaceuticals, Inc. (NASDAQ: SNSS) and WCCT Global, Inc. and a director of Foresight Labs, VISION 4. Ms. Kim received a B.S. in Chemical and Biomedical Engineering from Northwestern University and an M.B.A. from the University of Chicago. Among other experiences, qualifications, attributes and skills, Ms. Kim's extensive experience in leadership roles in biotechnology companies led to the conclusion of our Board that she should serve as a director of the Company in light of our business and structure.</p>

Name	Age (as of 4/5/18)	Director Since	Business Experience
Alan J. Lewis, Ph.D.	72	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 experiences, 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>

Name	Age (as of 4/5/18)	Director Since	Business Experience
Susan Mahony, Ph.D.	53	2017	<p>Dr. Mahony joined our Board in December 2017. Since 2011, Dr. Mahony has served as Senior Vice President and President of Lilly Oncology at Eli Lilly and Company (Lilly). Prior to that, from 2000 until 2011, Dr. Mahony served in a variety of leadership roles at Lilly, including Senior Vice President Human Resources and Diversity, President and General Manager Lilly Canada, and Executive Director Global Development. Dr. Mahony worked in sales and marketing at Bristol-Myers Squibb Company from 1995 to 2000, at Amgen Limited from 1991 to 1995, and at Schering Plough from 1989 to 1991. Dr. Mahony earned a B.Sc. and Ph.D. in pharmacy and was awarded an Honorary Doctorate from Aston University, and an M.B.A. from London Business School. Because of these and other professional experiences, Dr. Mahony possesses particular knowledge and experience in all aspects of corporate functions and company operations that strengthen the Board's collective qualifications, skills and experience. Among other experiences, qualifications, attributes and skills, Dr. Mahony's extensive experience in management at public pharmaceutical companies led to the conclusion of our Board that she should serve as a director of the Company in light of our business and structure.</p>

Name	Age (as of 4/5/18)	Director Since	Business Experience
William R. Ringo, Jr.	72	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 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 Immune Design Corp., Dermira, Inc. and Five Prime Therapeutics, Inc. In the last five years, Mr. Ringo has also served as a director of Sangamo Biosciences, Inc. and Mirati Technologies, 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>

<u>Name</u>	<u>Age (as of 4/5/18)</u>	<u>Director Since</u>	<u>Business Experience</u>
Derek A. Small	42	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 nine 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 2019 Annual Meeting of Stockholders or until their successors have been duly elected and qualified. Only votes “FOR” will affect the outcome. “WITHHOLD” 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**



## 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 Guidelines, Code of Conduct and Code of Ethics described below may be found in the Investors section of our website [www.assemblybio.com](http://www.assemblybio.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, Indiana 46032. Information on our website is not incorporated by reference in this proxy statement.

### Meetings of the Board

Our Company is under the general oversight of the Board as provided by the laws of Delaware and our Amended and Restated Bylaws. During the fiscal year ended December 31, 2017, the Board held nine meetings. Except for Dr. Mahony, who was not appointed to the Board until December 2017, and Ms. Kim, who was not appointed to the Board until 2018, each person who was a director during 2017 attended 75% or more of the aggregate meetings of the Board. Applicable NASDAQ listing standards require that independent directors meet from time to time in executive session. In fiscal 2017, 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 2017, other than Mr. Holubiak, attended last year's Annual Meeting.

### Board Composition

Our Nominating and Governance Committee aims to assemble a Board that brings to us 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 regarding the consideration of diversity in identifying director nominees, the Committee considers diversity in its evaluation of potential nominees. Since the 2017 Annual Meeting of Stockholders, the Board has appointed two new qualified individuals to serve as director on the Board, which individuals enhance the gender, age and ethnic diversity of the Board.

In fulfilling its responsibilities to select and recommend director nominees to our Board, our Nominating and Governance Committee annually evaluates our incumbent Board members and other candidates, if any, against the following criteria in determining whether to recommend these directors for nomination:

- 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.

Our Corporate Governance Guidelines provide that the Nominating and Governance Committee must be satisfied that each recommended nominee to the Board meets the following minimum qualifications:

- nominee shall have experience at a strategic or policymaking level in a business, government, non-profit or academic organization of high standing;
- nominee shall be highly accomplished in his or her respective field, with superior credentials and recognition;

- nominee shall be well regarded in the community and shall have a long-term reputation for high ethical and moral standards;
- 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 of directors, the nominee shall have a demonstrated history of actively contributing at board meetings.

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.

#### **Independence of Directors**

Because our common stock is listed on the NASDAQ Capital Market, our Board applies the independence standards under the NASDAQ Stock Market Rules (the NASDAQ listing rules) to all of our directors. Using the test provided in Rule 5605 of the Nasdaq Listing Rules, the Board has determined that current directors Anthony E. Altig, Mark Auerbach, Richard D. DiMarchi, Ph.D., Myron Z. Holubiak, Helen S. Kim, Alan J. Lewis, Ph.D., Susan Mahony, Ph.D. and William R. Ringo, Jr. are independent. 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 license certain intellectual property. After considering these factors, our Board has affirmatively determined that each of Mr. Altig, Mr. Auerbach, Dr. DiMarchi, Mr. Holubiak, Ms. Kim, Dr. Lewis, Dr. Mahony and Mr. Ringo does not have a relationship with us that would interfere with the exercise of independent judgment in carrying out his or her 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 us and our stockholders to be able to exercise discretion in combining or separating these positions as it deems appropriate in light of prevailing circumstances. The roles are currently 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 and Nominating and Governance 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.

#### **Board Committees**

The Board has four standing committees. Each committee operates under a charter that has been adopted by the Board, which can be found in the Corporate Governance section of the Investors section of our website at [www.assemblybio.com](http://www.assemblybio.com). Information on our website is not incorporated by reference in this

proxy statement. 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 table below sets forth the current membership of each of the standing committees and the number of meetings each committee held in 2017. Other than Dr. Mahony, who was appointed in December 2017, each director attended 75% or more of the meetings of the committees on which he or she served during the period for which he or she was a director or committee member in 2017. The table also sets forth the independence of each director. For purposes of the table, “independent” means the director is (1) independent under the NASDAQ listing rules, (2) a “non-employee director” as defined in Rule 16b-3 of the Securities Exchange Act of 1934, as amended (the Exchange Act) and (3) an “outside director” as that term is defined for purposes of Section 162(m) of the Internal Revenue Code of 1986, as amended (the Code).

	<b>Independent</b>	<b>Audit Committee</b>	<b>Compensation Committee</b>	<b>Nominating and Governance Committee</b>	<b>Science and Technology Committee</b>
<b>Number of Meetings in 2017</b>		5	11	5	3
Anthony E. Altig+	X	X		X	
Mark Auerbach+	X	X**	X		
Richard D. DiMarchi, Ph.D.	X				X**
Myron Z. Holubiak	X		X**	X	
Helen S. Kim	X				X
Alan J. Lewis, Ph.D.	X			X**	X
Susan Mahony, Ph.D.	X				X
William R. Ringo, Jr.*	X	X	X		
Derek A. Small					

\* Chairman of the Board

\*\* Committee Chair

+ “Audit Committee Financial Expert” as defined in Item 407(d) of Regulation S-K

#### *Audit Committee*

The Audit Committee was established in accordance with Section 3(a)(58)(A) of the Exchange Act 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.

At the direction of the Nominating and Governance Committee, the Audit Committee conducts an annual performance evaluation of the Audit Committee and reports 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 listing rules’ 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) and within the meaning of 10A-3(b)(1) of the Exchange Act). The Board has determined that Messrs. Altig and Auerbach each qualify as an “audit committee financial expert” as that term is defined in Item 407(d) of Regulation S-K promulgated by the SEC. In making that determination, the Board relied on the past business experience of Mr. Altig and Mr. Auerbach. 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 experience as a chief financial officer, 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. Please see the description of the business experience for Mr. Altig and Mr. Auerbach under the heading "Nominees for Director."

#### *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 listing rules, 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 for purposes of Section 162(m) of the Code.

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 the recommendations of management with respect to our annual corporate goals and objectives and advise the Board regarding such annual corporate goals and objectives;
- taking into consideration the Board-approved corporate goals and objectives, review and approve the annual goals and objectives of our principal executive officer and other executive officers;
- evaluate the principal executive officer's and the other executive officers' performance in light of approved goals and objectives;
- determine and approve the compensation levels and other terms of employment of the principal executive officer and other executive officers based on this evaluation, including with respect to each executive officer, his or her base salary, cash and equity-based compensation, annual performance-based cash bonus, special benefits, perquisites and incidental benefits and other incentive compensation, benefits and terms of employment;
- review and approve the compensation of our other employees 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 and recommend changes to the compensation of our directors;
- oversee the administration of, and periodically review and make changes to, our incentive compensation plans, equity-based compensation plans, and any material employee benefit, bonus, retirement, severance and other compensation plans;
- prepare the Compensation Committee report and recommend the inclusion of the report in our proxy statement or Annual Report on Form 10-K as required;
- 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, specified member(s) of the Committee or executive officers. 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 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. Our Nominating and Governance Committee consists of three directors, 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 NASDAQ listing rules.

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 our compliance with legal and regulatory requirements of its business operations, other than compliance with securities laws and regulations, including our financial reporting and disclosure obligations, or anti-bribery laws, which in each case shall be the responsibility of the Audit Committee.

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.

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. Our Amended and Restated Bylaws contain provisions for stockholders to recommend persons for nomination as a director and, subject to certain conditions, to nominate director candidates for inclusion in our proxy statement, as set forth in this proxy statement under “Deadline for Stockholder Proposals for 2019 Annual Meeting of Stockholders.” 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, and the Nominating and Governance Committee’s policy will be to evaluate any recommendation for director nominees proposed by stockholders using the same criteria. 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.

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 (or election, in the case of Ms. Kim and Dr. Mahony) 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), Ms. Kim, Dr. Lewis and Dr. Mahony. The primary purpose of our Science and Technology Committee is to assist the Board with oversight of our research and development activities and to advise the Board with respect to strategic and tactical scientific matters. In furtherance of its purpose, the Science and Technology Committee reviews, among other things:

- our overall scientific and research and development strategy;
- 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.

The Science and Technology Committee charter requires that the Science and Technology Committee meet at least twice per year. The Chair of the Science and Technology 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.

**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 Investors section of our website at [www.assemblybio.com](http://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 annualized cash compensation payable to our non-employee directors in 2017.

Director Position	Annual Cash Compensation <sup>(1)</sup>
All Non-Employee Directors	\$ 35,000
Chair of the Board	\$ 30,000
Audit Committee Chair	\$ 15,000
Service on Audit Committee (other than as Chair)	\$ 7,500
Chair of Nominating & Governance, Compensation or Science and Technology Committees	\$ 10,000
Service on Nominating & Governance, Compensation or Science and Technology Committees (other than as Chair)	\$ 5,000

- (1) The annual cash compensation that we pay to Board members, other than Mr. Small is based on their positions on the Board or the committees of the Board, and we do not compensate the Board members on a per meeting basis. The amounts reflected in the table above were in effect for 2017. Beginning June 1, 2018, non-employee directors will receive a cash retainer at an annualized rate of \$40,000.

Upon joining the Board, each new non-employee director is granted an option to purchase shares of our common stock, which vests over three years in three approximately equal installments on each anniversary of the date of grant. In December 2017, the Board set the option grant for new directors at 20,000 shares of common stock. Each year, on the date of our annual meeting of stockholders, each non-employee director that is elected will be entitled to receive a grant of an option to purchase 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. In 2017, the Board set the annual option award at 7,500 shares of common stock. The annual options to be awarded to directors elected at the 2018 annual meeting will remain at 2017 levels.

The following table sets forth information regarding cash and non-cash compensation earned by or paid to each of our non-employee directors serving as directors during 2017.

Name	Fees Earned or Paid in Cash (\$)	Option Awards (\$) <sup>(1)(2)</sup>	Total (\$)
Anthony E. Altig	47,500	135,371	182,871
Mark Auerbach	55,000	135,371	190,371
Richard D. DiMarchi, Ph.D.	45,000	135,371	180,371
Myron Z. Holubiak	50,000	135,371	185,371
Alan J. Lewis, Ph.D.	50,000	135,371	185,371
Susan Mahony, Ph.D. <sup>(3)</sup>	1,667	605,232	606,899
William R. Ringo, Jr.	77,500	135,371	212,871

- (1) As of December 31, 2017, our non-employee directors held the following unexercised options to purchase shares of our common stock: Mr. Altig, 91,500 shares; Mr. Auerbach, 91,500 shares; Dr. DiMarchi, 91,500 shares; Mr. Holubiak, 91,500 shares; Dr. Lewis, 47,500 shares, Dr. Mahony, 20,000 shares; and Mr. Ringo, 83,500 shares.
- (2) The reported amounts in the table above represent the aggregate grant date fair value of the options granted in 2017 computed in accordance with Financial Accounting Standards Boards (FASB) Accounting Standards Codification (ASC) Topic 718. Assumptions used in the calculation of these amounts are included in Note 2 of the financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2017.

- (3) Dr. Mahony was appointed to the board on December 14, 2017. Fees earned or paid in cash represents prorated payments of Dr. Mahony's prorated annual retainer (\$1,458) and committee retainer for service on the Science and Technology Committee (\$208). Option award represents Dr. Mahony's initial grant rather than an annual grant as presented for all other non-employee directors.

**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, Indiana 46032. Mr. Small received no such communications in 2017. 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.

**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 financial and other advisers concerning institutional stockholder feedback.

In December 2017, we received a letter from a stockholder requesting that we amend our bylaws to provide stockholders with a proxy access right. In response to the proposal, the Board amended our bylaws to implement proxy access by permitting a stockholder, or a group of up to 20 stockholders, owning at least 3% of our outstanding common stock continuously for at least three years, to nominate and include in our proxy materials for an annual meeting of stockholders, director nominees constituting up to the greater of two directors or 20% of the Board (rounded down to the nearest whole number), provided that the stockholder(s) and the director nominee(s) satisfy the requirements specified in the Amended and Restated Bylaws.

Also in 2017, we received a letter from an institutional investor that had concerns with our then-lack of gender diversity on the Board. Although we have not adopted a specific policy regarding the consideration of diversity in selecting director candidates, we have clarified that the Nomination and Governance Committee does consider diversity in its evaluation of potential nominees. In addition, since receiving the letter, we have added two new qualified individuals to the Board, which individuals enhance the gender, age and ethnic diversity of the Board.



**PROPOSAL NO. 2: ADVISORY VOTE TO APPROVE OUR NAMED EXECUTIVE OFFICERS' COMPENSATION**

**General**

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

At the 2017 Annual Meeting of Stockholders, we provided our stockholders with the opportunity to cast an advisory vote on our NEOs' compensation. Over 99% of the votes cast on our "Say on Pay" vote were voted in favor of the proposal in 2017.

Our NEOs' compensation subject to this vote is disclosed in the Executive Compensation section, the Compensation Discussion and Analysis, the compensation tables and the related narrative disclosure contained in this proxy statement. As discussed in these disclosures, we believe that our 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 (1) a market-competitive base salary, with targeted annual cash bonus opportunities based on individual achievement and Company performance against corporate goals, which are generally expected to be achieved within 12 months, and (2) 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 our 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 2018 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 2018 Annual Meeting of Stockholders."

The Executive Compensation section of this proxy statement contains more details on our NEOs' 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 us, 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. Our management, the Board and Compensation Committee intend to consider the results of this vote in making recommendations and determinations in the future regarding executive compensation arrangements and our executive compensation principles, policies and procedures.

Our current practice is to submit the compensation of our NEOs to our stockholders for an advisory vote on an annual basis. Accordingly, the next stockholder advisory vote on the compensation of our NEOs after the Annual Meeting is expected to take place at the 2019 Annual Meeting of Stockholders.

**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, on a non-binding advisory basis, of our NEOs' compensation. 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 APPROVAL, ON A NON-BINDING  
ADVISORY BASIS, OF OUR NAMED EXECUTIVE OFFICERS’ COMPENSATION.**

**PROPOSAL NO. 3: ADVISORY VOTE ON THE FREQUENCY OF FUTURE ADVISORY VOTES ON OUR NAMED EXECUTIVE OFFICERS' COMPENSATION**

**General**

Under the Dodd-Frank Act and Section 14A of the Exchange Act, at least once every six years, our stockholders are entitled to vote to indicate, on a non-binding advisory basis, how frequently they believe we should seek an advisory vote to approve our NEOs' compensation.

Prior to the Merger, in 2012, our stockholders voted on a similar proposal with the majority voting to hold an advisory vote to approve our NEOs' compensation every three years. After careful consideration of the "Say on Pay" vote, including that holding "Say on Pay" votes every year has become the generally accepted market standard, we changed our practice and began submitting approval of our NEOs' compensation to our stockholders for an advisory vote on an annual basis in 2015. Based on the Board's experience with prior advisory votes to approve our NEOs' compensation, the Board recommends a vote for holding the advisory vote to approve our NEOs' compensation every year. Stockholders may vote for every one, two or three years, or may abstain from voting on the following resolution:

"RESOLVED, that the option of every one year, two years or three years that receives the highest number of votes cast for this resolution will be the frequency with which the Company's stockholders recommend by advisory vote that the Company hold an advisory vote to approve the compensation of the Company's named executive officers."

This vote is non-binding. However, the Board and the Compensation Committee will consider the outcome of this vote in connection with decisions concerning the frequency with which to hold future advisory votes to approve our NEOs' compensation. As provided in the Dodd-Frank Act and Section 14A of the Exchange Act, our stockholders will have the opportunity to recommend the frequency of future advisory votes to approve our NEOs' compensation at least once every six years.

**Required Vote**

Assuming a quorum is present, the alternative receiving the largest number of affirmative votes cast by holders of common stock present in person or represented by proxy at the Annual Meeting and entitled to vote on Proposal No. 3 will be deemed to be the frequency recommended by our stockholders. Abstentions and broker non-votes will have no effect on the outcome of the vote on Proposal No. 3.

**Recommendation of the Board of Directors**

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE FOR THE FREQUENCY, ON A NON-BINDING ADVISORY BASIS, OF FUTURE ADVISORY VOTES TO APPROVE OUR NAMED EXECUTIVE OFFICERS' COMPENSATION EVERY "ONE YEAR."**

## MATTERS RELATING TO OUR INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

### Pre-Approval Policies and Procedures

The charter of the Audit Committee provides 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 registered public accounting firm. The pre-approval requirement is waived with respect to the provision of non-audit services for us if the “de minimis” 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 Ernst & Young LLP, our independent registered public accounting firm for the fiscal years ended December 31, 2017 and 2016.

### Fees and Services

The following table presents fees billed for professional audit services and other services rendered to us by Ernst & Young LLP for the years ended December 31, 2017 and 2016.

Fees	2017	2016
Audit Fees <sup>(1)</sup>	\$499,000	\$370,699
Audit-Related Fees	—	—
Tax Fees <sup>(2)</sup>	128,947	50,136
All Other Fees <sup>(3)</sup>	3,000	3,000
<b>Total</b>	<b>\$630,947</b>	<b>\$423,835</b>

(1) For professional services rendered for our annual audit and procedures related to our regulatory filings.

(2) For corporate tax compliance, routine on-call tax services, international tax advisory services, indirect (non-income) tax advisory and tax incentives, domestic tax advisory services.

(3) For online services.

Ernst & Young LLP did not engage persons who were not full-time, permanent employees to perform more than 50% of the hours needed to audit our financial statements for the fiscal years ended December 31, 2017 and 2016.

The Audit Committee of the Board considered all of the above activities to be compatible with the maintenance of Ernst & Young LLP’s independence. The Audit Committee discussed these services with Ernst & Young LLP and 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.

### Report of the Audit Committee of the Board of Directors

The Audit Committee reviews our 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 controls. In this context, the Audit Committee hereby reports as follows:

1. The Audit Committee has reviewed and discussed our consolidated audited financial statements for the year ended December 31, 2017 with management.
2. 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 (PCAOB).

3. The Audit Committee has 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.
4. 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, 2017.

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

**PROPOSAL NO. 4: RATIFICATION OF THE SELECTION OF THE  
INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

**General**

The Board has selected Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018 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 LLP has served as our independent registered public accounting firm since May 13, 2015.

Neither our Amended and Restated Bylaws nor other governing documents or law require stockholder ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm. However, the Board is submitting the selection of Ernst & Young LLP 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 LLP. 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. Representatives of Ernst & Young LLP are expected to be present at the Annual Meeting, where they will have an opportunity to make a statement and be available to respond to appropriate questions.

**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. 4 must be voted "FOR" the ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018. Abstentions will be deemed a vote against Proposal No. 4. Broker non-votes will not be considered towards vote totals on Proposal No. 4; however, the ratification of the selection of Ernst & Young LLP is a matter on which a broker, bank or other nominee has discretionary voting authority, so we do not expect any broker non-votes with respect to Proposal No. 4.

**Recommendation of the Board of Directors**

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

**PROPOSAL NO. 5: AMENDMENT AND RESTATEMENT OF OUR CERTIFICATE OF INCORPORATION TO INCREASE SHARES OF AUTHORIZED COMMON STOCK****General**

On January 24, 2018, our Board approved the amendment and restatement of our Third Amended and Restated Certificate of Incorporation, as amended (the Amendment), to increase the authorized number of shares of common stock, par value \$0.001 per share (Common Stock) from 50,000,000 to 100,000,000 shares and directed that the Amendment be submitted to a vote of our stockholders at the Annual Meeting. The Amendment also includes various changes to the Third Amended and Restated Certificate of Incorporation, as amended (the Certificate of Incorporation), that do not affect the substantive rights of our stockholders, including removing language that is no longer relevant and conforming certain provisions of the Certificate of Incorporation more closely to their corresponding sections of the Delaware General Corporation Law. The text of the proposed Fourth Amended and Restated Certificate of Incorporation, with proposed deletions indicated by strike-out and proposed revisions indicated by bold and underline, is attached as Appendix A. If the stockholders approve this Proposal No. 5, subject to the discretion of the Board, we will file the Amendment with the Secretary of State of the State of Delaware as soon as practicable.

The current Certificate of Incorporation authorizes the issuance of up to 55,000,000 shares of stock, of which 50,000,000 shares are designated as Common Stock and 5,000,000 shares are designated as preferred stock. No shares of preferred stock are issued and outstanding. If adopted, the Amendment will not result in an increase in the number of authorized shares of preferred stock.

As of December 31, 2017, we had 20,137,974 shares of Common Stock outstanding and 26,023,480 shares of Common Stock outstanding on a fully diluted basis, resulting in only 23,976,520 shares of Common Stock, or approximately 48% of our total authorized Common Stock, available for future issuances, which number will be further reduced if Proposals Nos. 6 and 7 are approved at the Annual Meeting or if we raise additional capital. The Board believes that it is an appropriate time to increase our authorized shares of Common Stock from 50,000,000 to 100,000,000.

**Purpose**

The Board believes it is in the Company's best interest to increase the number of authorized shares of Common Stock to give us greater flexibility in considering and planning for future corporate needs, including, but not limited to: raising additional capital, which is needed to fund our ongoing clinical and nonclinical research programs; making grants under equity compensation plans; attracting and retaining key employees, executive officers and directors; considering potential strategic transactions, including mergers, acquisitions, and business combinations; and other general corporate transactions. The Board believes that additional authorized shares of Common Stock will enable us to take timely advantage of market conditions and favorable financing and acquisition opportunities that become available to us without the delay and expense associated with convening a special meeting of our stockholders.

We have no current plan, commitment, arrangement, understanding or agreement regarding the issuance of the additional shares of Common Stock that will result from our adoption of the proposed Amendment. Except as otherwise required by law or the NASDAQ listing rules, the newly authorized shares of Common Stock will be available for issuance at the discretion of the Board (without further action by the stockholders) for various future corporate needs, including those outlined above. While adoption of the proposed Amendment would not have any immediate dilutive effect on the proportionate voting power or other rights of our existing stockholders, any future issuance of additional authorized shares of our Common Stock may, among other things, dilute the earnings per share of the Common Stock and the equity and voting rights of those holding Common Stock at the time the additional shares are issued.

In addition to the corporate purposes mentioned above, an increase in the number of authorized shares of our Common Stock may make it more difficult to, or discourage an attempt to, obtain control of us by means of a takeover bid that the Board determines is not in the best interest of us and our stockholders. However, the Board does not intend or view the proposed increase in the number of authorized shares of our Common Stock as an anti-takeover measure and is not aware of any attempt or plan to obtain control of us.

**Rights of Additional Authorized Shares**

Any authorized shares of Common Stock, if and when issued, would be part of our existing class of Common Stock and would have the same rights and privileges as the shares of Common Stock currently outstanding. Our stockholders do not have pre-emptive rights with respect to the Common Stock, nor do they have cumulative voting rights. Accordingly, should the Board issue additional shares of Common Stock, existing stockholders would not have any preferential rights to purchase any of such shares, and their percentage ownership of our then outstanding Common Stock could be reduced.

**Potential Adverse Effects of the Amendment**

Future issuances of Common Stock or securities convertible into Common Stock could have a dilutive effect on our earnings per share, book value per share and the voting power and interest of current stockholders. In addition, the availability of additional shares of Common Stock for issuance could, under certain circumstances, discourage or make more difficult any efforts to obtain control of us. The Board is not aware of any attempt, or contemplated attempt, to acquire control of us, nor is this proposal being presented with the intent that it be used to prevent or discourage any acquisition attempt. However, nothing would prevent the Board from taking any such actions that it deems to be consistent with its fiduciary duties.

**Required Vote**

Assuming a quorum is present, to be approved, a majority of the shares of common stock outstanding and entitled to vote on Proposal No. 5 must be affirmatively voted “FOR” the Amendment. Abstentions and broker non-votes will each have the same effect as a vote against Proposal No. 5.

**Recommendation of the Board of Directors**

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE “FOR” THE AMENDMENT AND RESTATEMENT OF OUR CERTIFICATE OF INCORPORATION TO INCREASE THE AMOUNT OF AUTHORIZED COMMON STOCK FROM 50,000,000 SHARES TO 100,000,000 SHARES.**



**PROPOSAL NO. 6: APPROVAL OF THE ASSEMBLY BIOSCIENCES, INC.  
2018 STOCK INCENTIVE PLAN**

**General**

On April 5, 2018, subject to stockholders' approval, the Board adopted the Assembly Biosciences, Inc. 2018 Stock Incentive Plan (the 2018 Plan). The 2018 Plan provides for the grant of equity awards to our employees, non-employee directors and consultants and is necessary to ensure that we can continue to grant equity awards to eligible recipients at levels determined to be appropriate by the Board and/or the Compensation Committee.

As of April 5, 2018, there were stock options to acquire 4,905,193 shares of common stock outstanding under our equity compensation plans. In addition, there were 156,559 shares subject to unvested full value awards with time-based vesting and 95,000 shares subject to unvested full value awards with performance vesting outstanding under our equity compensation plans. As of April 5, 2018, there were 437,328 shares of common stock available and unallocated under our equity compensation plans, of which 256,250 shares are only issuable as inducement awards to new employees under our 2017 Inducement Award Plan.

**Purpose**

The purpose of the 2018 Plan is to encourage ownership in the Company by our employees, directors and consultants and our affiliates whose long-term employment by or involvement with us is considered essential to our continued progress. This aligns the interests of the award recipients and stockholders and permits the award recipients to share in our success. The 2018 Plan provides an essential component of the total compensation package offered to our employees and other plan participants. It reflects the importance that we place on motivating employees and other plan participants to achieve superior results over the long-term and paying employees and other plan participants based on that kind of achievement. We strongly believe that our equity compensation programs and emphasis on employee and non-employee director stock ownership have been integral to our progress and that a continuation of and emphasis on those programs is necessary for us to achieve superior performance in the future. All of our, and our affiliates', employees, directors and our consultants are eligible to participate in the 2018 Plan.

We are requesting a share reserve under the 2018 Plan that we believe is modest yet sufficient to meet our retention needs for at least two years and will underpin one of our core compensation philosophies, namely to Pay for Performance by giving our employees and other plan participants the opportunity to share in our long-term growth through equity compensation.

**Rationale**

We believe you should vote to approve the 2018 Plan for the following reasons:

- *We are committed to sound equity compensation practices.* We recognize that equity compensation awards dilute stockholder equity and so must be used judiciously. Although our employee headcount is rapidly increasing as our business grows, we have aligned our compensation practices with industry norms among our peer group described in this proxy statement under "Executive Compensation — Compensation Discussion and Analysis — Independent Compensation Consultant — Compensation Adjustments and Peer Group Process." We believe our use of equity has been responsible and mindful of stockholder interests.
- *The 2018 Plan contains provisions that protect stockholder interests.* The 2018 Plan contains features that we believe further align the interests of our employees and directors with those of our stockholders, including, a minimum vesting requirement of one year for all time-vesting awards that are made to employees and a minimum vesting requirement of the earlier of (1) one year and (2) the next annual meeting of the stockholders for time-vesting awards that are made to directors, in each case subject to acceleration in the event of death, disability, retirement, separation of service or a Corporate Transaction (as defined below). The 2018 Plan also has no automatic acceleration of vesting provisions upon a Corporate Transaction.

- *Equity compensation helps us to attract and retain talent.* A talented, motivated and effective management team and workforce are essential to our continued progress. Equity compensation is an important component of our total compensation because we believe it will incentivize managers and employees to think and act like owners. Our employees are our most valuable asset and the awards permitted under the 2018 Plan are vital to our ability to attract and retain outstanding and highly skilled individuals. If the 2018 Plan is not approved by stockholders, retaining the best talent will be increasingly difficult.
- *Our current equity-pay mix aligns employee incentives with stockholder gains.* Our employee compensation consists of base salary payable in cash, annual performance-based cash bonuses and long-term incentives payable in the form of equity awards. Historically, most long-term incentive equity awards have consisted of options to purchase shares of common stock; however, the Compensation Committee may consider other equity awards under the 2018 Plan, including restricted stock, restricted stock units, stock appreciation rights and dividend equivalent rights. Annual long-term performance-based equity incentive awards granted in 2018 were a combination of stock option and restricted stock unit awards. Our target composition philosophy is to target base salary and annual performance-based cash bonuses at approximately the 50<sup>th</sup> percentile of our peer group and long-term equity incentive awards between the 50<sup>th</sup> and 75<sup>th</sup> percentile of our peer group. As employees only realize value from stock options and stock appreciation rights if the shares of common stock appreciate and the value of other equity awards depends on the price of our common stock, equity awards provide useful incentives to our employees to increase our stock price. If we are unable to offer equity awards to new and existing employees, we will need to increase the cash component of our compensation. This would divert our cash reserves away from our research and development activities and our clinical trials. This could negatively impact the progress of product candidates which in turn could impair stockholder value.
- *Equity compensation helps us avoid business disruption due to compensation programs.* If the 2018 Plan is not approved, we will have to restructure existing compensation programs for reasons not directly related to the achievement of our business objectives. If the 2018 Plan is not approved, it will be necessary to replace components of compensation to be awarded in equity with cash, or with other instruments that may not necessarily align employee interests with those of stockholders as effectively. We believe that such actions would be disruptive to us and our employees.
- *We believe our equity awards create deep, long-term incentives for our employees.* Our “overhang” (shares subject to equity compensation awards outstanding at fiscal year-end or available to be used for equity compensation, divided by fully diluted shares outstanding) at the end of 2017 was estimated to be approximately 29.1%. We believe that our employees’ and other plan participants’ holding equity is positive for our stockholders as equity represents a long-term interest of our employees and other plan participants in the value of our common stock.

#### **Material Terms of the 2018 Plan**

The following is a brief summary of the other principal provisions of the 2018 Plan and its operation. A copy of the 2018 Plan is attached as Appendix B to this proxy statement and is incorporated herein by reference. The following description of the 2018 Plan does not purport to be complete and is qualified in its entirety by reference to Appendix B. Capitalized terms used in this summary and not otherwise defined will have the meanings ascribed to such terms in 2018 Plan.

*Purpose of the 2018 Plan.* The purpose of the 2018 Plan is to encourage ownership in the Company by employees, directors and consultants of the Company and its affiliates whose long-term employment by or involvement with the Company is considered essential to our continued progress and, thereby, aligning the interests of the award recipients and stockholders and permitting the award recipients to share in our success. The 2018 Plan provides an essential component of the total compensation package offered to our employees and other plan participants. It reflects the importance placed by the Company on motivating employees and other plan participants to achieve superior results over the long-term and paying employees and other plan participants based on that kind of achievement. We strongly believe that our equity compensation programs and emphasis on employee and non-employee director stock ownership have been

integral to our progress and that a continuation of and emphasis on those programs is necessary for us to achieve superior performance in the future. All of our employees, directors and consultants and those of our affiliates are eligible to participate in the 2018 Plan.

*Types of Awards.* The 2018 Plan provides for the grant of non-qualified and incentive stock options (Options), stock appreciation rights (SAR), dividend equivalent rights, unrestricted stock, restricted stock, restricted stock units or other rights or benefits under the 2018 Plan (collectively, Awards).

*Shares Subject to the 2018 Plan.* No more than 1,900,000 shares of common stock may be issued pursuant to Awards under the 2018 Plan. The number of shares available for Awards, as well as the terms of outstanding Awards, are subject to adjustment as provided in the 2018 Plan for stock splits, stock dividends, recapitalizations and other similar events.

Each share of common stock subject to an Award granted pursuant to the 2018 Plan will reduce the aggregate number of shares available under the 2018 Plan by one share of common stock. Any shares of common stock that again become available for issuance under the 2018 Plan or our Amended and Restated 2014 Stock Incentive Plan (the 2014 Plan) due to a forfeiture, expiration or cancellation of an Award (or if the Award otherwise becomes unexercisable) will generally be added back to the aggregate plan limit of the 2018 Plan in this same manner and such shares will again be available for subsequent Awards, except as prohibited by law. In the event any Option or other Award granted under the 2018 Plan or our 2014 Plan is exercised through the tendering of shares of common stock (either actually or through attestation) or withholding shares of common stock, or in the event tax withholding obligations are satisfied by tendering or withholding shares of common stock, any shares of common stock so tendered or withheld shall not again be available for awards under the 2018 Plan. Shares of Common Stock subject to a SAR granted pursuant to Section 6(k) of the 2018 Plan that are not issued in connection with cash or stock settlement of the exercise of the SAR shall not again be available for award under the 2018 Plan. Shares of common stock reacquired by the Company on the open market or otherwise using cash proceeds from the exercise of Options shall not be available for awards under the 2018 Plan.

*Director Compensation Limit.* The 2018 Plan provides that the value of all awards awarded under the 2018 Plan and all other cash compensation paid by the Company to any non-employee director in any calendar year shall not exceed \$1,000,000.

*Administration.* The 2018 Plan will be administered by the Board or a Committee designated by the Board, which committee is constituted in such a manner as to satisfy the applicable laws and to permit such grants and related transactions under the 2018 Plan to be exempt from Section 16(b) of the Exchange Act in accordance with Rule 16b-3. Once appointed, such Committee shall continue to serve in its designated capacity until otherwise directed by the Board. Currently, the Compensation Committee serves as the Committee specified in the 2018 Plan and acts as the Administrator thereunder.

Subject to the terms of the 2018 Plan, the Administrator has express authority to determine the employees, directors or consultants who will receive Awards, the number of shares of common stock or other consideration to be covered by each Award, and the terms and conditions of Awards. The Administrator has broad discretion to prescribe, amend and rescind rules relating to the 2018 Plan and its administration, to interpret and construe the 2018 Plan and the terms of all Award agreements, and to take all actions necessary or advisable to administer the 2018 Plan or to effectuate its purposes. Subject to the terms of the 2018 Plan, the Administrator may accelerate the vesting of any Award, allow the exercise of unvested Awards, and may modify, replace, cancel or renew any Award.

*Indemnification.* We will indemnify and defend members of the Committee and their delegates to the extent permitted by law on an after-tax basis against all reasonable expenses, including attorneys' fees, actually and necessarily incurred in connection with the defense of any claim, investigation, action, suit or proceeding, or in connection with any appeal therein, to which they or any of them may be a party by reason of any action taken or failure to act under or in connection with the 2018 Plan, or any Award granted thereunder, and against all amounts paid by them in settlement thereof (provided such settlement is approved by the Company) or paid by them in satisfaction of a judgment in any such claim, investigation, action, suit or proceeding, except in relation to matters as to which it shall be adjudged in such claim,

investigation, action, suit or proceeding that such person is liable for gross negligence, bad faith or intentional misconduct; provided, however, that within 30 days after the institution of such claim, investigation, action, suit or proceeding, such person shall offer to us, in writing, the opportunity at our expense to defend the same.

*Minimum Vesting.* Time-based awards granted to employees under the 2018 Plan are subject to a one-year minimum vesting requirement other than in the case of death, disability, separation of service or a Corporate Transaction. Time-based awards granted to directors under the 2018 Plan may not vest until the earlier of one year from grant date and the next annual meeting of the stockholders, other than in the case of death, disability or a Corporate Transaction.

*Eligibility.* The Administrator may grant Options that are intended to qualify as incentive stock options (ISOs) only to employees of the Company or an affiliate that is a “parent corporation” or “subsidiary corporation” within the meaning of Section 424 of the Code, and may grant all other Awards to any employee, director or consultant. The 2018 Plan and the discussion below use the term “Grantee” to refer to the holder of an Award, or the shares of common stock issuable or issued upon exercise of an Award, under the 2018 Plan.

*Options.* Options granted under the 2018 Plan provide Grantees with the right to purchase shares of common stock at a predetermined exercise price. The Administrator may grant Options that are intended to qualify as ISOs or Options that do not so qualify (Non-Qualified Stock Options). To qualify as ISOs, Options must meet additional federal tax requirements, including a \$100,000 limit on the value of shares subject to ISOs that first become exercisable by a Grantee in any one calendar year.

*Exercise Price of Options.* The exercise price of ISOs granted to Grantees who own more than ten percent of the common stock of the Company or an affiliate on the grant date of the ISO may not be less than 110% of the fair market value of the shares of common stock subject to the ISO on the grant date. The exercise price of all other Options may not be less than 100% of the fair market value of the shares of common stock subject to the Option on the grant date.

*Exercise of Options.* To the extent exercisable in accordance with the applicable Award agreement, each Option may be exercised in whole or in part, and from time to time during its term, subject to earlier termination relating to a Grantee’s termination of continuous service. With respect to Options, the Administrator has the discretion to accept payment of the exercise price by any of the following methods (or any combination of them): cash or check in U.S. dollars, promissory note with such recourse, interest, security and redemption provisions as the Administrator determines, surrender of shares of common stock, broker assisted exercise, with respect to Options that are not ISOs, by net exercise or by past or future services rendered to the Company or an affiliate.

*Prohibition on Repricing.* Except in connection with certain corporate adjustment events, we may not, without stockholder approval, amend an Award granted under the 2018 Plan to reduce the Award’s exercise price per share, cancel and regrant new Awards with lower prices per share than the original price per share of the cancelled Awards, or cancel any Awards in exchange for cash or the grant of replacement Awards with an exercise price that is less than the exercise price of the original Awards, essentially having the effect of a repricing.

*Restricted Stock and Restricted Stock Units.* The Administrator may grant (1) shares of restricted stock that are forfeitable until certain vesting requirements are met, and (2) restricted stock units which represent the right to receive payment, subject to the passage of time and continuous service or the attainment of performance criteria as established by the Administrator, which may be settled for cash, shares of common stock or other securities or a combination. The Administrator has discretion to determine the terms and conditions under which a Grantee’s interests in restricted stock and restricted stock units become vested and non-forfeitable.

*Unrestricted Stock.* The Administrator may grant unrestricted stock in lieu of paying cash compensation.

*Dividend Equivalent Rights.* The Administrator may grant awards of dividend equivalent rights, which entitle the Grantee to compensation measured by dividends paid with respect to shares of common stock.

*Income Tax Withholding.* As a condition for the issuance of shares of common stock pursuant to Awards, the 2018 Plan requires the Grantee to make arrangements as we may require for satisfaction of any applicable federal, state, local or foreign withholding tax obligations that may arise in connection with the Award or the issuance of shares of common stock. Subject to approval by the Administrator, Grantees may elect to have their tax withholding obligations satisfied by authorizing the Company to withhold shares of common stock to be issued pursuant to exercise or vesting. Any shares held back to satisfy such tax withholding will not be available for future issuance under the 2018 Plan.

*Transferability.* Unless the Administrator provides otherwise, in its sole discretion, no Award may be sold, pledged, assigned, hypothecated, transferred, or disposed of in any manner other than by will or by the laws of descent or distribution and may be exercised, during the lifetime of the Grantee, only by the Grantee. Notwithstanding the foregoing, the Grantee may designate one or more beneficiaries of the Grantee's Award in the event of the Grantee's death on a beneficiary designation form provided by the Administrator.

*Certain Corporate Transactions.* Effective upon the consummation of a Corporate Transaction, all outstanding Awards under the 2018 Plan shall terminate unless they are assumed in connection with the Corporate Transaction.

The Administrator shall have the authority, exercisable either in advance of any actual or anticipated Corporate Transaction or at the time of an actual Corporate Transaction and exercisable at the time of the grant of an Award under the 2018 Plan or any time while an Award remains outstanding, to provide for the full or partial automatic vesting and exercisability of one or more outstanding unvested Awards under the 2018 Plan and the release from restrictions on transfer and repurchase or forfeiture rights of such Awards in connection with a Corporate Transaction on such terms and conditions as the Administrator may specify. The Administrator also shall have the authority to condition any such Award vesting and exercisability or release from such limitations upon the subsequent termination of the Continuous Service of the Grantee within a specified period following the effective date of the Corporate Transaction. The Administrator may provide that any Awards so vested or released from such limitations in connection with a Corporate Transaction shall remain fully exercisable until the expiration or sooner termination of the Award. Any ISOs accelerated in connection with a Corporate Transaction shall remain exercisable as an ISO under the Code only to the extent the \$100,000 limitation of Section 422(d) of the Code is not exceeded.

"Corporate Transaction" means any of the following transactions, provided, however, that the Administrator shall determine under parts (iv) and (v) whether multiple transactions are related, and its determination shall be final, binding and conclusive: (1) a merger or consolidation in which we are not the surviving entity, except for a transaction the principal purpose of which is to change the state in which we are incorporated; (2) the sale, transfer or other disposition of all or substantially all of our assets; (3) the complete liquidation or dissolution of the Company; (4) any reverse merger or series of related transactions culminating in a reverse merger (including, but not limited to, a tender offer followed by a reverse merger) in which we are the surviving entity but (A) the shares of common stock outstanding immediately prior to such merger are converted or exchanged by virtue of the merger into other property, whether in the form of securities, cash or otherwise, or (B) in which securities possessing more than 50% of the total combined voting power of our outstanding securities are transferred to a person or persons different from those who held such securities immediately prior to such merger or the initial transaction culminating in such merger; or (5) acquisition in a single or series of related transactions by any person or related group of persons (other than the Company or by a Company-sponsored employee benefit plan) of beneficial ownership (within the meaning of Rule 13d-3 of the Exchange Act) of securities possessing more than 50% of the total combined voting power of our outstanding securities.

*Term of the 2018 Plan; Amendments and Termination.* The term of the 2018 Plan is ten years from the date of its approval by our stockholders, except that no incentive stock options may be granted after April 5, 2028. The Board may, from time to time, amend, alter, suspend, discontinue or terminate the 2018 Plan; provided, that any amendment to increase the number of shares of common stock available for Awards under the 2018 Plan and certain other amendments will be subject to stockholder approval. Additionally, no amendment, suspension or termination of the 2018 Plan shall materially and adversely affect Awards already granted unless it relates to an adjustment pursuant to certain transactions that change our capitalization or it is otherwise mutually agreed between the Grantee and the Administrator.

Notwithstanding the foregoing, the Administrator may adopt such amendments to the 2018 Plan and the applicable award agreement or adopt other policies and procedures (including amendments, policies and procedures with retroactive effect), or take any other actions, that the Administrator determines are necessary or appropriate to (1) exempt the Award from Section 409A of the Code and/or preserve the intended tax treatment of the benefits provided with respect to the Award, or (2) comply with the requirements of Section 409A of the Code and related Department of Treasury guidance.

*Expected U.S. Federal Income Tax Consequences.* The following is a brief summary of certain U.S. federal tax consequences of certain transactions under the 2018 Plan. This summary is not intended to be complete and does not describe state or local tax consequences. Grantees in the 2018 Plan should review the current tax treatment with their individual tax advisors at the time of grant, exercise or any other transaction relating to an Award or the underlying shares.

Under the Code, we will generally be entitled to a deduction for federal income tax purposes at the same time and in the same amount as the ordinary income that Grantees recognize pursuant to Awards. For Grantees, the expected U.S. federal income tax consequences of Awards are as follows:

- *Non-Qualified Stock Options.* A Grantee will not recognize income at the time a Non-Qualified Stock Option is granted. At the time a Non-Qualified Stock Option is exercised, the Grantee will recognize ordinary income in an amount equal to the excess of (a) the fair market value of the shares of common stock issued to the Grantee on the exercise date over (b) the exercise price paid for the shares. At the time of sale of shares acquired pursuant to the exercise of a Non-Qualified Stock Option, the appreciation (or depreciation) in value of the shares after the date of exercise will be treated either as short-term or long-term capital gain (or loss) depending on how long the shares have been held.
- *ISOs.* A Grantee will not recognize income upon the grant of an ISO. There are generally no tax consequences to the Grantee upon exercise of an ISO (except that the amount by which the fair market value of the shares at the time of exercise exceeds the option exercise price is a tax preference item possibly giving rise to an alternative minimum tax). If the shares of common stock are not disposed of within two years from the date the ISO was granted or within one year after the ISO was exercised, any gain realized upon the subsequent disposition of the shares will be characterized as long-term capital gain and any loss will be characterized as long-term capital loss. If either of these holding period requirements are not met, then a “disqualifying disposition” occurs and (a) the Grantee recognizes ordinary income in the amount by which the fair market value of the shares at the time of exercise exceeded the exercise price for the ISO and (b) any remaining amount realized on disposition (except for certain “wash” sales, gifts or sales to related persons) will be characterized as capital gain or loss.
- *Restricted Stock and Restricted Stock Units.* In general, a Grantee will not recognize income at the time of grant of restricted stock or restricted stock units, unless the Grantee elects with respect to restricted shares to accelerate income taxation to the date of the Award by making a Section 83(b) election. If the Grantee makes such an election, such Grantee would recognize ordinary compensation income equal to the excess of the fair market value of the restricted shares on the grant date over any amount the Grantee pays for them (in which case subsequent gain or loss would be capital in nature). In the absence of an election to accelerate income taxation to the date of an Award, a Grantee will recognize taxable compensation income at the time the Award vests in an amount equal to the excess of the fair market value of any property that the Grantee receives over the amount paid for such property by the Grantee, or, in the case of restricted stock units, upon receipt of cash or shares of common stock.
- *Unrestricted Stock.* In general, a Grantee will recognize income at the time of grant of unrestricted stock.
- *Parachute Payments.* Under certain circumstances, the accelerated vesting, cash-out or accelerated lapse of restrictions on Awards in connection with a change in control of the Company might be deemed an “excess parachute payment” for purposes of the golden parachute tax provisions of Code Section 280G, and the Grantee may be subject to a 20% excise tax and we may be denied a tax deduction.

- *Income Taxes and Deferred Compensation.* The 2018 Plan provides that Grantees are solely responsible and liable for the satisfaction of all taxes and penalties that may arise in connection with Awards (including any taxes arising under Section 409A of the Code). Nevertheless, the 2018 Plan permits the Administrator to establish one or more programs under the 2018 Plan to permit selected Grantees the opportunity to elect to defer receipt of consideration upon exercise or vesting of an Award or other event that absent the election would entitle the Grantee to payment or receipt of shares of common stock or other consideration under an Award. The Administrator may establish the election procedures, the timing of such elections, the mechanisms for payments of, and accrual of interest or other earnings, if any, on amounts, shares of common stock or other consideration so deferred, and such other terms, conditions, rules and procedures that the Administrator deems advisable for the administration of any such deferral program.

### Eligibility

Persons eligible to participate in the 2018 Plan are our employees, directors and other consultants and those of our affiliates as selected from time to time by the Administrator in its discretion. As of April 5, 2018, not including five consultants, approximately 94 individuals are currently eligible to participate in the 2018 Plan, which includes five executive officers, 81 full-time employees who are not executive officers, and eight non-employee directors.

### New Plan Benefits

The Administrator may grant Awards under the 2018 Plan at its discretion. Future benefits to be received by a person or group under the 2018 Plan will depend on individual and corporate performance and other determinations to be made by the Administrator. Consequently, it is not possible as of the date of this proxy statement to determine future awards that will be received by our named executive officers or others under the 2018 Plan.

### Equity Plans

The following table sets forth information as of December 31, 2017 regarding shares of common stock that may be issued under our equity compensation plans:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants, RSUs, and rights (a)	Weighted average exercise price of outstanding options, warrants, RSUs, and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
<b>Equity compensation plans approved by our stockholders:</b>			
2014 Stock Incentive Plan(*)	3,336,246	\$ 11.51	587,391
2010 Equity Incentive Plan	595,334	\$ 7.77	—
Options assumed in Assembly Pharmaceuticals Merger	551,239	\$ 2.22	—
<b>Equity compensation plans not approved by our stockholders:</b>			
2017 Inducement Award Plan	189,000	\$ 26.57	611,000
Consultant Warrants	15,296	\$ 30.00	—
<b>Total</b>	<b><u>4,687,115</u></b>		<b><u>1,198,391</u></b>

(\*) 2014 Stock Incentive Plan shares available includes 73,876 shares of common stock forfeited under the 2010 Equity Incentive Plan on or after June 2, 2016.

As of April 5, 2018, the number of securities remaining available for future issuances under equity compensation plans excluding outstanding options and restricted stock units is 437,328 shares of common stock.

**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. 6 must be voted “FOR” approval of the 2018 Plan. Abstentions will be deemed a vote against Proposal No. 6. Broker non-votes will not be considered towards vote totals on Proposal No. 6.

**Recommendation of the Board of Directors**

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE “FOR” APPROVAL OF THE ASSEMBLY  
BIOSCIENCES, INC. 2018 STOCK INCENTIVE PLAN.**



## PROPOSAL NO. 7: APPROVAL OF THE 2018 EMPLOYEE STOCK PURCHASE PLAN

### General

On March 8, 2018, our Board adopted, subject to the approval of our stockholders, the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan (the ESPP). Based solely on the closing price of our common stock reported on the NASDAQ Capital Market on April 5, 2018, the maximum aggregate market value of the 400,000 shares of common stock that could potentially be issued under the ESPP is approximately \$18,540,000.

### Purpose

We believe that the adoption of the ESPP will benefit us by providing employees with an opportunity to acquire shares of our common stock, which gives employees a stake in the Company's growth, and will enable us to attract, retain and motivate valued employees.

### Material Terms of the ESPP

The following is a brief summary of certain provisions of the ESPP. A copy of the ESPP is attached as Appendix C to this proxy statement and is incorporated herein by reference. The following description of the ESPP does not purport to be complete and is qualified in its entirety by reference to Appendix C. It is our intention that the ESPP qualify as an "employee stock purchase plan" under Section 423 of the Code.

*Shares Subject to the Plan.* An aggregate of 400,000 shares will be reserved and available for issuance under the ESPP. If our capital structure changes because of a stock dividend, stock split or similar event, the number of shares that can be issued under the ESPP will be appropriately adjusted.

*Plan Administration.* The ESPP will be administered by the Compensation Committee, which will have full authority to make, administer and interpret such rules and regulations regarding the ESPP as it deems advisable.

*Eligibility.* All individuals classified as employees on the payroll records of the Company or its designated subsidiaries are eligible to participate in the ESPP so long as the employee has been employed for at least 30 days on the first day of the applicable offering period. No person who owns or holds, or as a result of participation in the ESPP would own or hold, common stock or options to purchase common stock, that together equal to 5% or more of total outstanding common stock is entitled to participate in the ESPP. No employee may exercise an option granted under the ESPP that permits the employee to purchase common stock having a value of more than \$25,000 (determined using the fair market value of the stock at the time such option is granted) in any calendar year.

*Participation; Payroll Deductions.* Participation in the ESPP is limited to eligible employees who authorize payroll deductions equal to a whole percentage of base pay to the ESPP. Employees may authorize payroll deductions, with a minimum of 1% of base pay and a maximum of 15% of base pay. As of April 5, 2018, there are approximately 85 employees who will be eligible to participate in the ESPP. Once an employee becomes a participant in the ESPP, that employee will automatically participate in successive offering periods, as described below, until such time as that employee withdraws from the ESPP, becomes ineligible to participate in the ESPP, or his or her employment ceases.

*Offering Periods.* Unless otherwise determined by the ESPP Administrator, each offering of common stock under the ESPP will be for a period of six months, which we refer to as an "offering period." The first offering period under the ESPP is expected to begin on June 15, 2018 and end on November 14, 2018. Subsequent offerings under the ESPP will generally begin on the first business day occurring on or after each November 15<sup>th</sup> and May 15<sup>th</sup> and will end on the last business day occurring on or before the following May 14<sup>th</sup> and November 14<sup>th</sup>, respectively. Shares are purchased on the last business day of each offering period, with that day being referred to as an "exercise date." The ESPP Administrator may establish different offering periods or exercise dates under the ESPP.

*Exercise Price.* On the first day of an offering period, employees participating in that offering period will receive an option to purchase shares of our common stock. On the exercise date of each offering period, the employee is deemed to have exercised the option, at the exercise price, to the extent of

accumulated payroll deductions. The option exercise price is equal to the lesser of (1) 85% the fair market value per share of our common stock on the first day of the offering period or (2) 85% of the fair market value per share of our common stock on the exercise date. The maximum number of shares of common stock that may be issued to any employee under the ESPP in any offering period is 1,000 or such other lesser number of shares as determined by the ESPP Administrator from time to time.

Subject to certain limitations, the number of shares of our common stock a participant purchases in each offering period is determined by dividing the total amount of payroll deductions withheld from the participant's compensation during the offering period by the option exercise price. In general, if an employee is no longer a participant on an exercise date, the employee's option will be automatically terminated, and the amount of the employee's accumulated payroll deductions will be refunded.

*Terms of Participation.* Except as may be permitted by the ESPP Administrator in advance of an offering, a participant may not increase or decrease the amount of his or her payroll deductions during any offering period but may increase or decrease his or her payroll deduction with respect to the next offering period by filing a new enrollment form within the period beginning 15 business days before the first day of such offering period and ending on the day prior to the first day of such offering period. A participant may withdraw from an offering period at any time without affecting his or her eligibility to participate in future offering periods. If a participant withdraws from an offering period, that participant may not again participate in the same offering period, but may enroll in subsequent offering periods. An employee's withdrawal will be effective as of the business day following the employee's delivery of written notice of withdrawal under the ESPP.

*Term; Amendments and Termination.* The ESPP will continue until terminated by the Board. The Board may, in its discretion, at any time, terminate or amend the ESPP. Upon termination of the ESPP, all amounts in the accounts of participating employees will be refunded.

#### **New Plan Benefits**

Since participation in the ESPP is voluntary, the benefits or amounts that will be received by or allocated to any individual or group of individuals under the ESPP in the future are not determinable.

#### **Summary of Federal Income Tax Consequences**

The following is only a summary of the effect of the U.S. income tax laws and regulations upon an employee and us with respect to an employee's participation in the ESPP. This summary does not purport to be a complete description of all federal tax implications of participation in the ESPP, nor does it discuss the income tax laws of any municipality, state or foreign country in which a participant may reside or otherwise be subject to tax.

A participant in the ESPP recognizes no taxable income either as a result of participation in the ESPP or upon exercise of an option to purchase shares of our common stock under the terms of the ESPP.

If a participant disposes of shares purchased upon exercise of an option granted under the ESPP within two years from the first day of the applicable offering period or within one year from the exercise date, which we refer to as a "disqualifying disposition," the participant will realize ordinary income in the year of that disposition equal to the amount by which the fair market value of the shares on the date the shares were purchased exceeds the purchase price. The amount of ordinary income will be added to the participant's basis in the shares, and any additional gain or resulting loss recognized on the disposition of the shares will be a capital gain or loss. A capital gain or loss will be long-term if the participant's holding period is more than 12 months, or short-term if the participant's holding period is 12 months or less.

If the participant disposes of shares purchased upon exercise of an option granted under the ESPP at least two years after the first day of the applicable offering period and at least one year after the exercise date, the participant will realize ordinary income in the year of disposition equal to the lesser of (1) 15% of the fair market value of the common stock on the first day of the offering period in which the shares were purchased and (2) the excess of the amount actually received for the common stock over the amount paid. The amount of any ordinary income will be added to the participant's basis in the shares, and any

additional gain recognized upon the disposition after that basis adjustment will be a long-term capital gain. If the fair market value of the shares on the date of disposition is less than the exercise price, there will be no ordinary income and any loss recognized will be a long-term capital loss.

We are generally entitled to a tax deduction in the year of a disqualifying disposition equal to the amount of ordinary income recognized by the participant as a result of that disposition. In all other cases, we are not allowed a deduction.

**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. 7 must be affirmatively voted “FOR” the approval of the ESPP. Abstentions will have the same effect as a vote against Proposal No. 7. Broker non-votes will not be considered towards vote totals on Proposal No. 7.

**Recommendation of the Board of Directors**

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE “FOR” THE APPROVAL OF THE ASSEMBLY BIOSCIENCES, INC. 2018 EMPLOYEE STOCK PURCHASE PLAN.**

**EXECUTIVE OFFICERS**

As of April 5, 2018, our executive officers are: Derek A. Small, our President and Chief Executive Officer; Graham Cooper, our Chief Financial Officer and Chief Operating Officer, Richard J. Colonno, Ph.D.; our Executive Vice President and Chief Scientific Officer of Virology Operations; Uri A. Lopatin, M.D., our Chief Medical Officer; and Jacqueline S. Papkoff, Ph.D., our Senior Vice President, Chief Scientific Officer Microbiome. Information on Mr. Small is provided above under the heading “Nominees for Director.” Information on each of Mr. Cooper and Drs. Colonno, Lopatin and Papkoff is below. For information on Mr. Small, see “Proposal No. 1: Election of Directors — Nominees for Director.”

<b>Name</b>	<b>Age (as of 4/5/18)</b>	<b>Business Experience</b>
Graham Cooper	48	Mr. Cooper joined as Chief Financial Officer and Chief Operating Officer in March 2018. Mr. Cooper was the Chief Financial Officer of Receptos, Inc. (Receptos) from February 2013 until Receptos was acquired by Celgene Corporation in August 2015. Following Celgene’s acquisition of Receptos and before joining the Company, Mr. Cooper served as a consultant and director to various other biotechnology companies. In 2012, Mr. Cooper was the Executive Vice President, Finance and Chief Financial Officer of Geron Corporation, a biopharmaceutical company focused on cancer therapies. From 2006 until 2011, Mr. Cooper served as Senior Vice President, Chief Financial Officer and Treasurer of Orexigen Therapeutics, Inc., a biotechnology company focused on obesity. From 1999 to 2006, Mr. Cooper held positions of increasing responsibility including Director, Health Care Investment Banking, at Deutsche Bank Securities, where he was responsible for executing and managing a wide variety of financing and merger and acquisition transactions in the life sciences field. From August 1992 to January 1995, he worked as an accountant at Deloitte & Touche, and was previously a C.P.A. Mr. Cooper currently serves on the Board of Directors for Bioniz Therapeutics, Inc., Kezar Life Sciences, Inc., and Unity Biotechnology, Inc. Mr. Cooper holds a B.A. in Economics from the University of California, Berkeley and an M.B.A. from the Stanford Graduate School of Business.
Richard J. Colonno, Ph.D.	68	Dr. Colonno is our Executive Vice President and Chief Scientific Officer of Virology Operations. Dr. Colonno joined as Chief Scientific Officer in January 2016 and became Executive Vice President and Chief Scientific Officer of Virology Operations in January 2018. Dr. Colonno has been instrumental in the discovery and development of multiple approved antiviral drugs, including Baraclude <sup>®</sup> and Reyataz <sup>®</sup> . From September 2007 to January 2016, Dr. Colonno 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. Colonno 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. Colonno received a B.A.

Name	Age (as of 4/5/18)	Business Experience
Uri A. Lopatin, M.D.	46	<p>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.</p> <p>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.</p>
Jacqueline S. Papkoff, Ph.D.	62	<p>Dr. Papkoff joined as Senior Vice President, Chief Scientific Officer Microbiome in April 2018. Dr. Papkoff was Senior Vice President, Research at Evelo Biosciences, Inc. from May 2016 to October 2017. From January 2013 to May 2016, Dr. Papkoff was Vice President, Immunology Scientific Innovation at Johnson &amp; Johnson California Innovation Center as a representative of the Janssen immunology therapeutic area. From 2008 to 2012, Dr. Papkoff was an independent biotherapeutic research and development consultant to biotech and pharmaceutical companies. In 2006 and 2007, Dr. Papkoff was Executive Vice President Therapeutics, Chief Scientific Officer at CFD Therapeutics, Inc. From 2002 until 2006, Dr. Papkoff was initially Vice President, Discovery and later Executive Vice President, Therapeutics at diaDexus, Inc. Dr. Papkoff received a B.A. in Biology with highest honors from the University of California, Santa Cruz in 1977 and received a Ph.D. in Biology from the University of California, San Diego in 1982.</p>

## EXECUTIVE COMPENSATION

### Compensation Discussion and Analysis

#### *Compensation Philosophy and Overview*

In general, our 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 our short-term and long-term goals. Accordingly, an important component of the Committee's compensation philosophy is to align the financial interests of our executive officers with those of our stockholders. Every year, we give our stockholders an opportunity to cast an advisory vote to approve the compensation of our named executive officers. At our 2015 Annual Meeting of Stockholders, which was our first annual meeting of stockholders after our acquisition of Assembly Pharmaceuticals, Inc., 92% of the votes cast on our "Say on Pay" proposal were voted in favor of the proposal. At our 2016 Annual Meeting of Stockholders, over 99% of the votes cast on our Say on Pay proposal were voted in favor of the proposal. Our Say on Pay proposal was similarly well received last year at the 2017 Annual Meeting of Stockholders, as the proposal again received the support of over 99% of the votes cast. While the Compensation Committee considered the results of the non-binding, advisory vote in establishing the fiscal 2018 compensation, no specific actions were deemed necessary, because the Compensation Committee believed the result of the Say on Pay vote was a confirmation that stockholders were in general agreement with the Compensation Committee's compensation philosophy and practice. The Compensation Committee will continue to consider the Say on Pay voting results and other feedback provided by our stockholders when making future compensation decisions concerning our executive officers.

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

- **Pay for Performance:** We offer (1) targeted annual cash bonus opportunities based on individual achievement and Company performance against corporate goals, which are generally expected to be achieved within 12 months, and (2) the opportunity to share in our long-term success through equity compensation;
- **Attract and Retain Superior Performers:** We provide a market-competitive base salary, bonus and other compensation elements that are competitive with those companies that are competing for available employees; and
- **Pay Equitably:** We believe that it is important to apply generally consistent guidelines for all of our NEOs. To deliver equitable pay, the Compensation Committee considers each NEO's complexity of responsibility, qualifications and performance, both individually and in a team context.

In addition to striving to meet the goals above, we have instituted the following executive compensation practices:

<b>What We Do</b>	<b>What We Don't Do</b>
✓ Annual cash bonus opportunities tied to individual and Company performance	✗ No guaranteed bonuses
✓ Equity grants have multi-year vesting requirements	✗ No tax gross-ups
✓ Compensation Committee is independent	✗ No special retirement plans for executives
✓ Use an independent compensation consultant	✗ No special health or welfare benefits
✓ Employment agreements have double-trigger acceleration rights	✗ No hedging or pledging our stock without pre-approval
✓ Limited perquisites	

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.

*Looking Ahead to 2018*

While no significant changes will be made to our base salary structure in 2018, the Compensation Committee has made changes to the other two components of our compensation program — annual performance-based cash bonuses and long-term equity incentive awards.

***Annual Performance-Based Cash Bonuses***

On December 8, 2017, the Compensation Committee approved a new cash bonus plan, the 2018 Discretionary Bonus Plan (the 2018 Bonus Plan). The 2018 Bonus Plan became effective January 1, 2018 and is designed to motivate, retain and reward employees in 2018. Under the 2018 Bonus Plan, annual performance-based cash bonuses will be paid to our employees, including our NEOs, based on achievement of (1) certain Board-approved Company-wide objectives weighted to reflect their relative importance to our achievement of our goals and (2) certain individual performance objectives, which may include certain department, group and/or team objectives applicable to the participants. Bonus targets for our NEOs will range from 35% to 50% of a participant's base salary.

The Compensation Committee will determine, considering analysis and recommendations from management, the degree to which the Company-wide objectives have been met, which will be expressed as a percentage. This percentage will be used (1) to serve as the basis for the Compensation Committee's determination of the aggregate size of the bonus pool and (2) to adjust each Participant's bonus level up or down, as applicable.

The Compensation Committee will exercise its discretion in determining the amount of the cash bonus earned annually by our NEOs. In determining the cash bonus for the CEO, the Compensation Committee will make its own evaluation of the achievements. In determining the cash bonuses for the other NEOs, the Compensation Committee will consider the recommendations made by the CEO.

***Long-term Equity Incentive Awards***

In 2018, we changed our annual grants from being solely grants of stock options to a mix of stock options and time-based restricted stock units (RSUs). We believe that RSUs serve as an additional tool to motivate our employees, including our NEOs, to achieve longer-term financial goals that are expected to lead to increased value to our stockholders, with less dilution to stockholders.

*Named Executive Officers*

Our named executive officers for 2017 are as follows:

Name	Title
Derek A. Small	President and Chief Executive Officer
David J. Barrett	Chief Financial Officer and Chief Operating Officer <sup>(1)</sup>
Richard J. Colonno, Ph.D.	Chief Scientific Officer <sup>(2)</sup>
Uri Lopatin, M.D.	Chief Medical Officer and Vice President, Research and Development
Thomas E. Rollins	Chief Development Officer

(1) On March 8, 2018, Mr. Barrett stepped down as Chief Financial Officer and Chief Operating Officer. Mr. Barrett is continuing as an employee in a strategic advisor role and will transition to a consulting role later in 2018.

(2) On January 1, 2018, Dr. Colonno was promoted and his title changed to Executive Vice President and Chief Scientific Officer of Virology Operations.

*Our Management Team's 2017 Accomplishments*

- Augmented the research and development teams for our two innovative platform programs, our hepatitis B virus (HBV)-cure program and our Microbiome program and improved operational and administrative functions.

HBV-cure program

- Completed Phase 1a human safety studies for ABI-H0731 and reported results at major scientific conferences.
- Initiated a Phase 1b trial in hepatitis B patients in June 2017 for ABI-H0731.
- Selected ABI-H2158 as our second-generation clinical candidate and presented preclinical data at major scientific conferences.
- Initiated IND-enabling studies on ABI-H2158.
- Advanced a number of third-generation molecules toward possible candidate selection in our HBV program.

Microbiome program

- Established a collaboration with Allergan Pharmaceuticals International Limited for our Microbiome program focused on our gastrointestinal (GI) indications. This collaboration, which provided for up-front cash payment of \$50 million and provides for potential milestone payments of \$2.8 billion, includes initial indications consisting of ulcerative colitis, Crohn's disease and irritable bowel syndrome.
- Announced the initiation of our research and development programs in non-alcoholic steatohepatitis (NASH) and immuno-oncology, among other disease indications of interest in the future for this platform.

*Independent Compensation Consultant*

In October 2016, the Compensation Committee approved the engagement of Radford, an Aon Hewitt Company, as the Compensation Committee's independent outside compensation consultant (Compensation Consultant). The Compensation Consultant's fees were paid by the Company but approved by the Compensation Committee. The Compensation Committee retained the Compensation Consultant to conduct an analysis for the 2017 compensation cycle. The Compensation Consultant conducted analysis and provided advice on, among other things, the appropriate peer group, officer cash bonus structure, annual compensation for the 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 and future business objectives and strategy.

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.

The Compensation Committee has determined that the Compensation Consultant's work did not raise any conflicts of interest in 2017. 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 us, the level of fees received from us 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 our 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 the Compensation Consultant on a periodic basis.

*Compensation Adjustments and Peer Group Process*

Our compensation philosophy has been implemented under the supervision of the Compensation Committee. Our Compensation Committee reviews and approves the compensation for our CEO. The Compensation Committee also has direct responsibility for reviewing and approving the compensation of



all of our executive officers. To assist the Compensation Committee, the CEO makes recommendations to the Compensation Committee as to specific elements (i.e., base salary, annual performance-based cash bonus and long-term equity incentive 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.

Our CEO, General Counsel, Senior Vice President, Human Resources and Organization, Chief Financial Officer/Chief Operating Officer, in addition to the Compensation Consultant and outside legal counsel, regularly attend portions of the Compensation Committee meetings to provide analysis, information and management's recommendations on various human resources and compensation matters. Members of management 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 for benchmarking. As part of its analysis for 2017, 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 Consultant to ensure the peer group is consistent with our current business objectives and strategy.

The list of peer companies is approved based on various factors including industry classification, market capitalization, headcount and stage of development. In October 2016, with assistance from the Compensation Consultant, the Compensation Committee re-evaluated the peer group. Based upon market capitalization criteria of between \$50 million and \$400 million and headcount, the Compensation Committee approved the removal of Five Prime Therapeutics, Inc., Neuralstem, Inc. and SCYNEXIS Inc. from the peer group and the addition of new companies noted below to the peer group. The Compensation Committee used the revised peer group (the 2017 Peer Group) set forth below to inform compensation decisions for 2017.

Aevi Genomic Medicine, Inc. (f/k/a Medgenics, Inc.)	Calithera Biosciences, Inc.	Ignyta, Inc.
Arbutus Biopharma Corp.	Capricor Therapeutics, Inc.	Immune Design Corp.
Arrowhead Pharmaceuticals, Inc.	Cascadian Therapeutics, Inc.	Mirati Therapeutics, Inc.
aTyr Pharma, Inc.	ContraFect Corp.	Pfenex Inc.*
Audentes Therapeutics, Inc.*	Dicerna Pharmaceuticals, Inc.	Regulus Therapeutics Inc.
Aviragen Therapeutics, Inc.*	Editas Medicine, Inc.*	Sangamo Therapeutics, Inc.
Bellicum Pharmaceuticals, Inc.	Flex Pharma, Inc.	Synthetic Biologics, Inc.

\* Company added to 2017 Peer Group.

As of October 2016, when the Compensation Consultant completed its work developing recommendations for the 2017 Peer Group, the 50th percentile of market capitalization and headcount of the 2017 Peer Group were \$199 million and 48 employees, respectively. Meanwhile, our market capitalization and headcount were \$138 million and 64 employees, respectively.

After the list of peer companies is approved, management and the Compensation Consultant present 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. These recommendations are discussed with and without management present and are discussed with the Compensation Consultant. The Compensation Committee then determines what, if any, adjustments to the compensation elements are appropriate for executive officers other than the CEO. For 2017 compensation, the Compensation Committee used the 2017 Peer Group to inform its decision-making regarding both the elements of compensation (i.e., base salary, annual performance-based cash bonuses and long-term equity incentive awards) and total compensation. While any individual NEO's compensation may be above or below these levels, based on that individual's experience, amount of responsibility and either individual or Company-wide performance, the Compensation Committee's general philosophy is that base salary and annual performance-based bonus opportunities should target the 50<sup>th</sup> percentile of our peers, and long-term equity incentive compensation should be set between the 50<sup>th</sup> and 75<sup>th</sup> percentile of our peers to achieve our overall compensation-related goals. The Compensation Committee uses the range between the 50<sup>th</sup> and 75<sup>th</sup> percentile of our peers when granting long-term equity incentive awards to give our employees, including our NEOs, the opportunity to share in the long-term growth of our Company. Exceptions to the Compensation Committee's general philosophy will be made under exceptional circumstances.

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.

#### *Components of our Executive Compensation Program*

The principal components of our executive compensation program are base salary, annual performance-based cash 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 2016 and 2017, effective as of March 1 of each year were as follows:

NEO	2016	2017	Percentage Increase
Derek A. Small	\$450,000	\$475,000	5.6%
David J. Barrett	373,100	385,000	3.2%
Richard J. Colonna, Ph.D.	380,000	391,400	3.0%
Uri A. Lopatin, M.D.	350,000	367,500	5.0%
Thomas E. Rollins	360,000	370,500	2.9%

Mr. Small and Dr. Lopatin received increases of 5.6% and 5.0% based upon their personal performance, the Company's performance and to make their base salaries more competitive with compensation paid to CEOs and CMOs at comparable companies, including our peer group. Mr. Barrett, Dr. Colonno and Mr. Rollins received increases of approximately 3.0% in connection with Company-wide increases for employees with a title of Vice President or above, which were merit-based and reflected the Company's strong performance in 2016.

***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 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 in the first quarter of the following year based on achievement of the pre-determined Company-wide and individual 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 2017, annual bonuses were based on achievement of Company goals related to development of our HBV-cure and Microbiome programs, including research and development, financial operations/investor relations and business development goals, including third-party collaborations. These included:

- Advance our HBV-cure program's first Core protein Allosteric Modifier (CpAM) product candidate, ABI-H0731, through Phase 1a human studies for safety and pharmacokinetics and Phase 1b clinical trials in hepatitis B patients;
- Identify a second CpAM product candidate (ABI-H2158) and initiate Investigative New Drug (IND) enabling studies;
- Advance a third CpAM product candidate in our HBV-cure program toward IND-enabling studies;
- Advance our Microbiome program's collaboration with Allergan Pharmaceuticals International Limited;
- Establish manufacturing capability enabling to supply pilot-scale amounts of drug substance and drug product for our Microbiome program;
- Nominate a new internal indication and initiate IND-enabling studies by our Microbiome program;
- Ensure inflow of capital to fund ongoing research and development for our HBV-cure and Microbiome programs; and
- Build our organization and expand our internal capabilities to meet the needs of a growing company.

In determining the amounts to be paid under our performance-based cash bonus program, each officer's potential bonus was weighted differently, depending on the respective area of responsibility and contributions to achieving our corporate goals. The Compensation Committee determined that the Company generally met or exceeded its 2017 goals for the HBV-cure program and its finance and operational functions and that the Microbiome program made significant progress towards meeting its 2017 goals.

### ***Long-term Equity Incentive Awards***

Our equity-based long-term incentive program is designed to align our NEOs' long-term incentives with those of our stockholders. 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 motivate management to (1) generate significant total stockholder return as measured by sustained increases in our stock price and (2) retain skilled employees. In furtherance of these objectives, equity awards to NEOs and other executives and employees are a critical component of our 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. In 2017, we began to grant performance-based RSUs as well as stock options in certain situations as an additional tool to motivate our NEOs to achieve longer-term financial goals that are expected to lead to increased value to our stockholders.

Awards to our executive officers other than our CEO are recommended by the CEO and the Compensation Consultant and approved by the Compensation Committee. Grants of awards to our CEO are discussed and determined by the Compensation Committee, in consultation with the Compensation Consultant, without the CEO being present.

In determining the size of annual equity grants, the Compensation Committee considers individual and Company-wide performance, internal pay equity considerations and the value of existing long-term equity incentive awards. After considering these factors, in March 2017, our Compensation Committee approved the stock option grants to our NEOs shown in the table below, and in December 2017, our Compensation Committee approved a performance-based award of 120,000 RSUs to Dr. Colonna, our Executive Vice President and Chief Scientific Officer of Virology Operations.

NEO	Options to Purchase Common Stock		Restricted Stock Units	
	Number of Shares	Grant Date Fair Value <sup>(1)</sup>	Number of Shares	Grant Date Fair Value <sup>(1)</sup>
Derek A. Small	40,000	\$ 717,892	—	—
David J. Barrett	25,000	\$ 448,683	—	—
Richard J. Colonna, Ph.D.	30,000	\$ 538,419	120,000 <sup>(2)</sup>	\$5,313,600
Uri A. Lopatin, M.D.	12,500	\$ 224,342	—	—
Thomas E. Rollins	10,000	\$ 179,474	—	—

- (1) The reported amounts represent the grant date fair value of the award, computed in accordance with FASB ASC Topic 718 disregarding any estimated forfeitures related to service-based vesting. Assumptions used in the calculation of these amounts are included in Note 2 of the financial statements included in the Annual Report on Form 10 K for the year ended December 31, 2017.
- (2) Reflects performance-based RSUs granted on December 8, 2017 to Dr. Colonna in recognition of the significant progress made by our HBV-cure program in 2017. Subject to Dr. Colonna's continuous service to the Company through the later of (a) August 1, 2018 and (b) achievement of the applicable performance milestones, these RSUs vest upon four performance-based milestones, the first of which was achieved on January 1, 2018. The 25,000 shares of common stock underlying those RSUs for which the performance-based milestone was met remain subject to a time-vesting component and vest in full on August 1, 2018. The remaining three milestones relate to advancement of our HBV-cure program and its product candidates, which, if disclosed, would put us at a competitive disadvantage.

The above options vest over two 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 that they have created for our stockholders. The RSUs granted to Dr. Colonna vest, subject to Dr. Colonna's continuous service to the Company through the later of (1) August 1, 2018 and (2) achievement of the applicable performance milestones. In addition, Dr. Colonna has the opportunity to earn an additional grant of 20,000 RSUs in the event of superior achievement of his performance

milestones. Any vested RSUs subject to the award will be settled upon the earliest to occur of a separation from service, a change in control or March 1, 2023.

#### ***Other Compensation***

In 2017, we maintained 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).

#### ***Other Executive Compensation Policies***

##### *Deductibility of Executive Compensation*

Generally, Section 162(m) of the Code disallows a federal income tax deduction for public corporations of remuneration in excess of \$1 million paid for any fiscal year to “covered employees” of the corporation. With respect to taxable years before January 1, 2018, remuneration in excess of \$1 million was exempt from this deduction limit if it qualified as “performance-based compensation” within the meaning of Section 162(m) and was payable pursuant to a binding written agreement in effect on November 2, 2017. In 2017, the Compensation Committee endeavored to structure compensation to maintain deductibility under Section 162(m) of the Code to the extent practicable while maintaining the ability to provide a competitive compensation program for our named executive officers.

Recently-enacted tax legislation, effective for taxable years beginning after December 31, 2017, (1) expands the scope of Section 162(m) such that all named executive officers are “covered employees” and anyone who was a named executive officer in any year after 2016 will remain a covered employees for as long as he or she (or his or her beneficiaries) receive compensation from the Company and (2) eliminates the exception to the deduction limit for commission-based compensation and performance-based compensation except with respect to certain grandfathered arrangements in effect as of November 2, 2017 that are not subsequently materially modified. Accordingly, compensation paid to our named executive officers in excess of \$1 million will not be deductible unless it qualifies for the transition relief applicable to certain arrangements in place as of November 2, 2017, as described above.

The Compensation Committee believes that stockholder interests are best served if the Committee retains maximum flexibility to design executive compensation programs that meet stated business objectives. For these reasons, the Compensation Committee, while considering tax deductibility as a factor in determining executive compensation, may not limit such compensation to those levels that will be deductible, particularly in light of the expansion of the covered employee group and the elimination of the exception for performance-based compensation.

##### *Sections 280G and 4999 of the Code*

Sections 280G and 4999 of 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 we (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, directors and executive officers are prohibited from selling our securities “short” at any time. In addition, unless the transaction has been approved by the Audit Committee, directors and executive officers may not at any time (1) buy or sell puts, calls or similar instruments on our securities, (2) engage in any other hedging transaction with respect to our securities or (3) pledge our stock as collateral for a loan. None of our NEOs have pledged our stock. Directors and executive officers may not hold our stock in a margin account.

### Compensation Risk Assessment

We believe that our executive compensation policies and programs do not encourage excessive or unnecessary risk taking. This is primarily because 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. As a result, we do not believe that our compensation programs are reasonably likely to have a material adverse effect on us.

In 2016, the Compensation Committee considered implementing a clawback policy. To date, we have no approved products on the market and have generated no product revenues. As a result, our compensation-related goals are not tied to financial metrics. Given these facts, the Compensation Committee concluded that adopting a clawback policy was premature at the time because none of our incentive-based compensation would be affected by a restatement of our financial statements.

The Compensation Committee also has expressed interest in gathering information regarding and considering implementing stock ownership guidelines in 2018.

### Summary Compensation Table

The following table sets forth all compensation earned in the fiscal years set forth below by our Named Executive Officers.

Name and Principal Position	Year	Salary (\$) <sup>(1)</sup>	Bonus (\$)	Stock Awards (\$) <sup>(2)</sup>	Option Awards (\$) <sup>(2)</sup>	Non-Equity Incentive Plan Compensation (\$) <sup>(3)</sup>	Total (\$)
Derek A. Small <sup>(4)</sup> <i>President and Chief Executive Officer</i>	2017	470,833	—	—	717,892	250,000	1,438,725
	2016	445,400	—	—	—	213,750	659,150
	2015	415,696	—	—	—	204,750	620,446
David J. Barrett <sup>(5)</sup> <i>Chief Financial Officer and Chief Operating Officer</i>	2017	413,152	—	—	448,683	204,600	1,066,435
	2016	401,137	—	—	—	177,300	578,437
	2015	363,346	—	—	—	180,250	543,596
Richard J. Colonno, Ph.D. <sup>(6)</sup> <i>Chief Scientific Officer</i>	2017	389,500	—	5,313,600	538,419	166,400	6,407,919
	2016	377,320	75,000 <sup>(7)</sup>	—	1,055,948	125,000	1,633,268
Uri A. Lopatin, M.D. <i>Chief Medical Officer and Vice President of Research and Development</i>	2017	375,352	—	—	224,342	128,700	728,394
	2016	344,167	—	—	—	116,000	460,167
	2015	319,000	—	—	—	95,700	414,700
Thomas E. Rollins <sup>(8)</sup> <i>Chief Development Officer</i>	2017	368,750	—	—	179,474	103,800	652,024
	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 our PTO policy: (1) \$4,446 for Mr. Small in 2015; (2) \$30,136, \$30,136 and \$4,159 for Mr. Barrett in 2017, 2016 and 2015, respectively; and (3) \$10,769 in 2017 for Dr. Lopatin.
- (2) The reported amounts represent the grant date fair value of the award, computed in accordance with FASB ASC Topic 718 disregarding any estimated forfeitures related to service-based vesting. Assumptions used in the calculation of these amounts are included in Note 2 of the financial statements included in the Annual Report on Form 10-K for the year ended December 31, 2017.
- (3) Non-equity incentive plan compensation represents amounts paid as annual performance awards. Annual performance-based cash bonuses are paid in the first quarter based on the achievement of Company performance goals and other factors deemed relevant by the Compensation Committee for the prior year.
- (4) 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.

- (5) On February 10, 2015, Mr. Barrett assumed the role of Chief Operating Officer. On March 8, 2018, Mr. Barrett stepped down as Chief Financial Officer and Chief Operating Officer. Mr. Barrett is continuing as an employee in a strategic advisor role and will transition to a consulting role later in 2018.
- (6) On January 5, 2016, Dr. Colonno became an employee of the Company. His annualized base salary for 2016 was \$380,000. On January 1, 2018, Dr. Colonno was promoted and his title changed to Executive Vice President and Chief Scientific Officer of Virology Operations.
- (7) The reported amount represents a signing bonus paid to Dr. Colonno in connection with his acceptance of our offer of employment pursuant to the terms of his employment agreement.
- (8) On January 11, 2016, Mr. Rollins became an employee of the Company. His annualized base salary for 2016 was \$360,000.

#### Grants of Plan-Based Awards

The following table provides information for each of our NEOs regarding 2017 annual and long-term incentive award opportunities. Specifically, the table presents the 2017 grants of annual non-equity incentive awards, stock options and restricted stock unit awards. This table does not include annual grants of stock options and restricted stock unit awards made in March 2018.

Name	Grant Date	Estimated Future Payouts Under Non-Equity Incentive Plan Awards Target (\$)	Estimated Future Payouts Under 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 Stock and Option Awards (\$) <sup>(1)</sup>
Derek A. Small	—	237,500	—	—	—	—
	3/29/2017	—	—	40,000	25.34	717,892
David J. Barrett	—	192,500	—	—	—	—
	3/29/2017	—	—	25,000	25.34	448,683
Richard J. Colonno, Ph.D.	—	156,560	—	—	—	—
	3/29/2017	—	—	30,000	25.34	538,419
	12/8/2017	—	120,000	—	—	5,313,600
Uri A. Lopatin, M.D.	—	128,625	—	—	—	—
	3/29/2017	—	—	12,500	25.34	224,342
Thomas E. Rollins	—	129,675	—	—	—	—
	3/29/2017	—	—	10,000	25.34	179,474

- (1) The reported amounts represent the grant date fair value of the award, computed in accordance with FASB ASC Topic 718 disregarding any estimated forfeitures related to service-based vesting. Assumptions used in the calculation of these amounts are included in Note 2 of the financial statements included in the Form 10-K for the year ended December 31, 2017.

**Outstanding Equity Awards at December 31, 2017**

The following table contains certain information concerning outstanding equity awards held by the NEOs as of December 31, 2017.

Name	Option Awards				Stock Awards	
	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights that Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights that Have Not Vested (\$)
Derek A. Small	466,238	—	2.22	5/15/2024	—	—
	—	40,000 <sup>(1)</sup>	25.34	3/29/2027	—	—
David J. Barrett	741,800	—	7.20	7/11/2024	—	—
	—	25,000 <sup>(1)</sup>	25.34	3/29/2027	—	—
Richard J. Colonno, Ph.D.	50,000 <sup>(2)</sup>	150,000 <sup>(2)</sup>	7.03	1/11/2026	—	—
	—	30,000 <sup>(1)</sup>	25.34	3/29/2027	—	—
	—	—	—	—	120,000 <sup>(3)</sup>	5,430,000
Uri A. Lopatin	160,000	—	7.20	7/10/2024	—	—
	—	12,500 <sup>(1)</sup>	25.34	3/29/2027	—	—
Thomas E. Rollins	19,123 <sup>(2)</sup>	57,369 <sup>(2)</sup>	7.03	1/11/2026	—	—
	2,061 <sup>(2)</sup>	6,184 <sup>(2)</sup>	6.36	2/17/2026	—	—
	10,066 <sup>(2)(4)</sup>	30,197 <sup>(2)</sup>	6.36	2/17/2026	—	—
	—	10,000	25.34	3/29/2027	—	—

- (1) These options vest and become exercisable 50% on the first anniversary of the grant date and the remainder over the next twelve months in approximately equal installments.
- (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) Reflects performance-based restricted stock units granted on December 8, 2017 that vest upon the occurrence of certain performance-based milestones as described above under the heading “Compensation Discussion and Analysis — Components of our Executive Compensation Program — Long-Term Equity Incentive Awards.”

**Option Exercises and Stock Vested**

No options held by NEOs were exercised during 2017, and no stock awards held by the NEOs vested during 2017.

**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 NEOs serve pursuant to an employment agreement.

*Derek A. Small*

In connection with the Merger in July 2014, we 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 2017 was \$475,000 (effective as of March 1) and his target bonus opportunity was 50% of his base salary. In March 2018, Mr. Small's annual base salary was increased to \$525,000, but his target bonus opportunity remained unchanged.

We have agreed to use our 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, we shall for each of the first three 12-month periods following our 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 our 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 our PTO policy or required by law and reimbursement of approved business expenses in accordance with our 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 us 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 us, we will provide Mr. Small the following benefits: (1) a lump sum payment equal to 18 months of his then current base salary, (2) an amount equal to his target annual bonus, (3) immediate vesting in full of all equity awards held by Mr. Small, (4) extension of the exercise period for all stock options held by Mr. Small to the end of their term, and (5) if Mr. Small 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, our 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, in each case other than within six months following a change of control, and provided that Mr. Small signs and does not revoke a general release of claims against us, we will provide him the following benefits: (1) continued payment of his then base salary for 12 months following the date of termination of employment, (2) 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, (3) extension of the exercise period for all vested stock options held by Mr. Small to the end of their term, and (4) 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 our 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, we 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 2017 (effective as of March 1) was \$385,000, and his target bonus opportunity was 50% of his base salary. In March 2018, Mr. Barrett's base salary was increased to \$460,000, but his target bonus opportunity remained unchanged. On March 8, 2018, Mr. Barrett stepped down from his positions as Chief Financial Officer and Chief Operating Officer. Mr. Barrett is currently continuing as an employee in a strategic advisor role and expects to transition to a consulting role later in 2018.

If Mr. Barrett's employment agreement is terminated due to non-renewal of the agreement, 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 us 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 us, we will provide him the following benefits: (1) a lump-sum payment equal to 18 months of his then-current base salary, (2) an amount equal to his target annual bonus as established by the Board, (3) immediate vesting in full of all equity awards held by Mr. Barrett, (4) extension of the exercise period for all stock options held by Mr. Barrett to the end of their term, and (5) 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, our 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), in each case other than within six months following a change of control, and provided that Mr. Barrett signs and does not revoke a general release of claims against us, we will provide him with the following benefits: (1) continued payment of his then-base salary for 12 months following the date of termination of employment, (2) 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, (3) extension of the exercise period for all vested stock options held by Mr. Barrett to the end of their term, and (4) 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, our 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. 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. Colunno, Ph.D.*

Effective January 5, 2016, we entered into an employment agreement with Dr. Colunno. The agreement has a term of five years and will be automatically extended for additional one-year periods unless we notify Dr. Colunno at least 180 days prior to the then current expiration date that we do not intend to extend the employment agreement. Dr. Colunno's base salary in 2017 was \$391,400, and his target bonus opportunity was 40% of his base salary. In March 2018, Dr. Colunno's base salary was increased to \$410,000, and his target bonus opportunity remained unchanged.

If Dr. Colunno's employment agreement is terminated due to non-renewal of the agreement, Dr. Colunno is entitled to payment of any accrued and unpaid base salary through the termination date,

accrued and unused PTO to the extent provided under our PTO policy or required by law and reimbursement of approved business expenses in accordance with our expense reimbursement policy.

If Dr. Colonna'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. Colonna's employment is terminated by us without cause (as defined in his employment agreement) and not by non-renewal of the term of the employment agreement or by Dr. Colonna 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. Colonna signs and does not revoke a general release of claims against us, we will provide Dr. Colonna the following benefits: (1) a lump sum payment equal to 18 months of his then current base salary, (2) an amount equal to his target annual bonus, (3) immediate vesting in full of all equity awards held by Dr. Colonna, (4) extension of the exercise period for all stock options held by Dr. Colonna to the end of their term, and (5) if Dr. Colonna 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, our obligation to pay such premiums will terminate earlier if he becomes eligible for insurance benefits from another employer during such period.

If Dr. Colonna's employment is terminated as a result of his disability (as defined in his employment agreement), by us without cause, or by Dr. Colonna for good reason, in each case other than within six months following a change of control, and provided that Dr. Colonna signs and does not revoke a general release of claims against us, we will provide him the following benefits: (1) continued payment of his then base salary for 12 months following date of termination of employment, (2) immediate vesting in full of all equity awards held by Dr. Colonna that would have become vested during the 12 months following termination of employment, (3) extension of the exercise period for all vested stock options held by Dr. Colonna to the end of their term, and (4) if Dr. Colonna 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, our 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. Colonna'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.

*Uri A. Lopatin, M.D.*

In connection with the Merger in July 2014, we entered into an employment agreement with Dr. Lopatin. Dr. Lopatin's employment agreement provides for an at-will employment arrangement. Dr. Lopatin's base salary in 2017 was \$367,500 (effective as of March 1) and his target bonus opportunity was 35% of his base salary. In March 2018, Dr. Lopatin's annual base salary was increased to \$390,000, and his target bonus opportunity remained unchanged.

If Dr. Lopatin'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 six months following such termination.

If Dr. Lopatin's employment is terminated by us without cause (as defined in his employment agreement) or by Dr. Lopatin for good reason (as defined in his employment agreement), and provided that Dr. Lopatin signs and does not revoke a general release of claims against us, we will provide him the following benefits: (1) continued payment of his then base salary for six months following the date of termination of employment, (2) immediate vesting in full of all equity awards held by Dr. Lopatin that would have become vested during the six months following termination of employment, (3) extension of the exercise period for all vested stock options held by Dr. Lopatin to the end of their term, and (4) if Dr. Lopatin properly elects COBRA, reimbursement of his COBRA premiums for six months following termination or until Dr. Lopatin becomes eligible for insurance benefits from another employer, whichever is earlier.

*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 2017 was \$370,500, and his

target bonus opportunity was 35% of his base salary. In March 2018, no change was made to Mr. Rollins's base salary or his target bonus opportunity.

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 us, we will provide Mr. Rollins with the following benefits: (1) 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; (2) 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); (3) the extension of the exercise period for all vested options held by Mr. Rollins to the end of their term; and (4) 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, our 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.

#### 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, 2017. 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 (\$)
<b>Derek A. Small</b>					
Cash Severance	475,000	475,000	475,000	475,000	950,000
Continuation of Benefits	10,718	10,718	10,718	—	16,077
Equity Acceleration <sup>(1)</sup>	696,850	696,850	696,850	—	796,400
<b>David J. Barrett</b>					
Cash Severance	385,000	385,000	385,000	385,000	770,000
Continuation of Benefits	10,718	10,718	10,718	—	16,077
Equity Acceleration <sup>(1)</sup>	495,531	495,531	495,531	—	497,750
<b>Richard J. Colunno, Ph.D.</b>					
Cash Severance	391,400	391,400	391,400	391,400	743,660
Continuation of Benefits	7,446	7,446	7,446	—	11,169
Equity Acceleration <sup>(1)</sup>	2,433,638	2,433,638	2,433,638	—	6,330,300

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 (\$)
<b>Uri A. Lopatin, M.D.</b>					
Cash Severance	183,750	183,750	—	183,750	183,750
Continuation of Benefits	5,359	5,359	—	—	5,359
Equity Acceleration <sup>(1)</sup>	155,547	155,547	—	—	155,547
<b>Thomas E. Rollins</b>					
Cash Severance	370,500	—	—	—	500,175
Continuation of Benefits	11,525	—	—	—	11,525
Equity Acceleration <sup>(1)</sup>	1,376,739	—	—	—	3,806,678

(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 29, 2017, the last trading day of the year, which was \$45.25 per share. This represents the in-the-money value of accelerated stock options as of December 31, 2017.

#### Compensation Committee Report

Management has prepared the Compensation Discussion and Analysis, beginning on page 48. 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 by:           The Compensation Committee  
                               Myron Z. Holubiak, Chairman  
                               Mark Auerbach  
                               William R. Ringo, Jr.

#### CEO Pay Ratio

As required by Section 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 402(u) of Regulation S-K, and the guidance thereunder, we determined the ratio of the annual total compensation of Mr. Small relative to the annual total compensation of our median employee.

For purposes of reporting annual total compensation and the ratio of annual total compensation of the CEO to the median employee, both the CEO and median employee's annual total compensation were calculated consistent with the disclosure requirement of executive compensation under the Summary Compensation Table.

To determine our median employee for all employees other than our Chief Executive Officer who were employed by us as of December 31, 2017, we used the following consistently applied compensation method: annualized base salary plus target incentive bonus. In accordance with Item 402(u) and the instructions thereto, we included all full-time, part-time and temporary employees. We do not have any seasonal employees. We believe our consistently applied compensation method reasonably reflects the total annual compensation of our employees. To determine the annual total compensation of our median employee, we used our consistently applied compensation method and included an estimated grant date fair value of a stock option award, computed in accordance with FASB ASC Topic 718, because we widely distribute annual equity awards to employees.

After applying the methodology described above, our estimated median employee compensation was \$177,153. Our CEO's compensation in the Summary Compensation Table was \$1,438,725. Therefore, our CEO to median employee pay ratio is estimated to be 8.1 to 1. This CEO to median employee pay ratio reflects the Company's reasonable good faith estimate of such ratio.

This information is being provided for compliance purposes and is a reasonable estimate calculated in a manner consistent with SEC rules, based on our internal records and the methodology described above. The SEC rules for identifying the median compensated employee allow companies to adopt a variety of methodologies, to apply certain exclusions and to make reasonable estimates and assumptions that reflect their employee populations and compensation practices. Accordingly, the pay ratio reported by other companies may not be comparable to the pay ratio reported above, as other companies have different employee populations and compensation practices and may use different methodologies, exclusions, estimates and assumptions in calculating their own pay ratios. Neither the Compensation Committee nor management of the Company used the CEO Pay Ratio measure in making compensation decisions.

#### **Compensation Committee Interlocks and Insider Participation**

Messrs. Holubiak, Auerbach and Ringo served as members of our Compensation Committee during the year ended December 31, 2017. 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 2017, 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.

**CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS**

The written charter of our Audit Committee authorizes and the NASDAQ listing 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,” since January 1, 2017, 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.

## 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 based on 20,429,400 shares outstanding as of April 5, 2018 by (1) each person known by us to beneficially own more than 5% of the outstanding shares of common stock, (2) each of our directors, (3) each of our NEOs, as listed in the Summary Compensation Table below, and (4) all of our directors, NEOs and executive officers as a group.

This table is based upon information supplied by our NEOs, 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 April 5, 2018 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, Indiana 46032. Applicable percentages are based on 20,429,400 shares outstanding on April 5, 2018.

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 (%)
<b>5% Stockholders:</b>		
EcoR1 Capital, LLC <sup>(1)</sup> 409 Illinois Street San Francisco, CA 94158	2,943,164	14.4%
Jennison Associates LLC <sup>(2)</sup> 466 Lexington Avenue New York, NY 10017	2,123,900	10.4%
OrbiMed Advisors LLC OrbiMed Capital LLC <sup>(3)</sup> 601 Lexington Avenue, 54 <sup>th</sup> Floor New York, NY 10022	1,397,100	6.8%
Adam Zlotnick <sup>(4)</sup> 615 Clifton Avenue Bloomington, IN 47401	1,289,009	6.3%
Acuta Capital Partners LLC <sup>(5)</sup> 1301 Shoreway Road, Suite 350 Belmont, CA 94002	1,087,104	5.3%
BlackRock Inc. <sup>(6)</sup> 55 East 52 <sup>nd</sup> Street New York, NY 10055	1,078,097	5.3%
venBio Select Advisor LLC <sup>(7)</sup> 120 West 45 <sup>th</sup> Street, Suite 2802 New York, NY 10036	1,068,534	5.2%
<b>Directors and Named Executive Officers:</b>		
Anthony E. Altig <sup>(8)</sup>	99,500	*
Mark Auerbach <sup>(9)</sup>	91,500	*
Richard D. DiMarchi, Ph.D. <sup>(10)</sup>	410,740	2.0%
Myron Z. Holubiak <sup>(9)</sup>	91,500	*



Name of Beneficial Owner	Shares Beneficially Owned	Percentage Owned (%)
Helen S. Kim <sup>(11)</sup>	0	*
Alan J. Lewis, Ph.D. <sup>(9)</sup>	37,500	*
Susan Mahony, Ph.D. <sup>(11)</sup>	0	*
William R. Ringo, Jr. <sup>(12)</sup>	98,965	*
Derek A. Small <sup>(13)</sup>	1,123,962	5.4%
David J. Barrett <sup>(14)</sup>	775,779	3.7%
Richard J. Colonno, Ph.D. <sup>(15)</sup>	117,500	*
Uri A. Lopatin, M.D. <sup>(16)</sup>	793,943	3.9%
Thomas E. Rollins <sup>(17)</sup>	68,333	*
All directors, NEOs and executive officers as a group (15 persons) <sup>(18)</sup>	3,709,222	18.2%

\* 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 26, 2018 by Prudential Financial, Inc. (the Prudential 13G/A) and the Schedule 13G/A filed with the SEC on February 6, 2018 by Jennison Associates, LLC (the Jennison 13G/A). According to the Prudential 13G/A, as of December 31, 2017, Prudential Financial, Inc., through Quantitative Management Associates LLC, holds sole voting and dispositive power over 3,600 shares of common stock (0.02%) and through its indirect ownership of 100% of the equity interest in Jennison Associates, LLC, Prudential Financial, Inc. may be deemed to be the beneficial owner of an aggregate amount of 2,123,900 shares of common stock, of which 2,120,300 shares (10.53%) are held by Jennison Associates, LLC. According to the Jennison 13G/A, as of December 31, 2017, Jennison Associates, LLC has sole voting power over 2,120,300 of the shares of common stock and shared dispositive power over 2,120,300 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 1,161,009 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 April 5, 2018 pursuant to the exercise of stock options.

- (5) Based on the information contained in the Schedule 13G filed with the SEC on February 14, 2018 by Acuta Capital Partners LLC (Acuta), an investment advisor. According to the Schedule 13G, as of December 31, 2017, Acuta beneficially owns 1,087,104 shares of common stock (5.4%). Acuta has sole voting and dispositive power of 1,087,104 shares of common stock.
- (6) Based on the information contained in the Schedule 13G filed with the SEC on February 1, 2018 by BlackRock, Inc. (Blackrock), a parent holding company or control person. According to the Schedule 13G, as of December 31, 2017, BlackRock beneficially owns 1,078,097 shares of common stock (5.4%). BlackRock has sole voting power of 1,051,811 shares of common stock and sole dispositive power of 1,078,097 shares of common stock. Various persons have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of the common stock. No one person's interest in the common stock is more than five percent of the total outstanding common shares. Subsidiaries holding shares of common stock are as follows: BlackRock Advisors, LLC, BlackRock Capital Management, Inc., BlackRock Asset Management Canada Limited, BlackRock (Luxembourg) S.A., BlackRock Fund Advisors, BlackRock Asset Management Ireland Limited, BlackRock Institutional Trust Company, National Association, BlackRock Financial Management, Inc., BlackRock Asset Management Schweiz AG and BlackRock Investment Management, LLC.
- (7) Based on the information contained in the Schedule 13G filed with the SEC on February 12, 2018 by venBio Select Advisor LLC (venBio), an investment advisory and management services firm and Behzad Aghazadeh, the portfolio manager and controlling person of venBio. According to the Schedule 13G, as of December 31, 2017, venBio beneficially owns 1,068,534 shares of common stock (5.3%). venBio has sole voting and dispositive power of 1,068,534 shares of common stock.
- (8) Includes 8,000 shares of common stock and 91,500 shares of common stock that Mr. Altig has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (9) Includes shares of common stock that the individual has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (10) Includes 319,240 shares of common stock and 91,500 shares of common stock that Dr. DiMarchi has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (11) Individual has a stock option grant that will not be exercisable for any shares within 60 days of April 5, 2018.
- (12) Includes 19,465 shares of common stock and 79,500 shares of common stock that Mr. Ringo has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (13) Includes 634,391 shares of common stock and 489,571 shares of common stock that Mr. Small has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (14) Consists of (a) 61,060 shares of common stock, and (b) 714,719 shares of common stock that Mr. Barrett has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (15) Consists of 117,500 shares of common stock that Dr. Colonno has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (16) Consists of (a) 626,651 shares of common stock, of which 5,000 shares of Common Stock are owned beneficially by Dr. Lopatin's wife and 621,651 are owned by a revocable grantor trust of which Dr. Lopatin is the trustee and sole beneficiary, and (b) 167,292 shares of common stock that Dr. Lopatin has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (17) Consists of 68,333 shares of common stock that Mr. Rollins has the right to acquire from us within 60 days of April 5, 2018 pursuant to the exercise of stock options.
- (18) Includes the shares of common stock described in footnotes (8) through (17).

**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, 2017.

**DEADLINE FOR STOCKHOLDER PROPOSALS FOR THE 2019 ANNUAL MEETING OF STOCKHOLDERS**

Any stockholder who meets the requirements of the proxy rules under the Exchange Act may submit proposals to the Board to be included in next year's proxy statement and on our proxy card for the 2019 Annual Meeting of Stockholders. 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 19, 2018, to our Corporate Secretary at 11711 N. Meridian Street, Suite 310, Carmel, Indiana 46032; provided, however, that if our 2019 Annual Meeting of Stockholders is held before May 1, 2019 or after June 30, 2019, then the deadline is a reasonable amount of time prior to the date we begin to print and mail our proxy statement for the 2019 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 Corporate 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 2019 Annual Meeting of Stockholders or any other annual meeting, or by the tenth 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 permit a stockholder, or a group of up to 20 eligible stockholders, that has owned at least 3% of our outstanding common stock for at least three years to nominate and include in our proxy statement candidates for the Board, subject to certain requirements. Any such nomination must be received at the address above no earlier than the close of business on November 21, 2018 and no later than the close of business on December 21, 2018; provided, however, that if our 2019 Annual Meeting of Stockholders is held before April 30, 2019 or after June 29, 2019, then the deadline is the close of business on the date that is 180 days prior to the 2019 Annual Meeting of Stockholders or the tenth day following the date that the 2019 Annual Meeting of Stockholders is first publicly disclosed. Any such notice must meet the other requirements set forth in our Amended and Restated Bylaws, which are publicly available on the SEC's website.

Our Amended and Restated Bylaws also provide for separate notice procedures to recommend a person for nomination as a director, provided that such nominee 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 nominate a director, written notice must be received by the Corporate 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 2019 Annual Meeting of Stockholders or any other annual meeting, or not later than the tenth 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 or in the event that less than 70 days' notice or prior public disclosure of the date of the annual meeting is given or made to stockholders.

**DELIVERY OF DOCUMENTS TO STOCKHOLDERS SHARING AN ADDRESS**

The 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, Indiana 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.

**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.

## Proposed Fourth Amended and Restated Certificate of Incorporation

~~THIRDFOURTH~~ AMENDED AND RESTATED  
CERTIFICATE OF INCORPORATION  
OF  
~~VENTRUSASSEMBLY~~ BIOSCIENCES, INC.

(Pursuant to Sections 242 and 245 of the General Corporation Law of the State of Delaware)

~~Ventrus~~Assembly Biosciences, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "DGCL"), certifies that:

A. The name of the corporation is ~~Ventrus~~"Assembly Biosciences, Inc." (the "Corporation").

B. The Corporation's original Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on October 7, 2005, under the name South Island Biosciences, Inc., an Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on October 24, 2005, ~~and~~ a second Amended and Restated Certificate of Incorporation, which included a provision to change the Corporation's name to Ventrus Biosciences, Inc., was filed with the Secretary of State of the State of Delaware on April 5, 2007 (the "Second Amended and Restated Certificate of Incorporation"); a third Amended and Restated Certificate of Incorporation was filed with the Secretary of the State of Delaware on November 10, 2010 (the "Third Amended and Restated Certificate of Incorporation") and a Certificate of Amendment of the Third Amended and Restated Certificate of Incorporation was filed with the Secretary of State of Delaware on July 10, 2014, which included a provision to change the Corporation's name to Assembly Biosciences, Inc.

C. This ~~Third~~Fourth Amended and Restated Certificate of Incorporation (the "Certificate of Incorporation") was duly adopted in accordance with Sections 242 and 245 of the ~~General Corporation Law of the State of Delaware~~DGCL, and hereby amends and restates in its entirety the ~~Second~~Third Amended and Restated Certificate of Incorporation as follows.

## ARTICLE I

The name of the corporation is "~~Ventrus~~Assembly Biosciences, Inc." (the "Corporation").

## ARTICLE II

The registered office of the Corporation in the State of Delaware is ~~2711 Centerville Road, Suite 400~~251 Little Falls Drive, in the City of Wilmington, County of New Castle 19808. The name of the registered agent of the Corporation at such address is Corporation Service Company.

## ARTICLE III

The nature of the business or purposes to be conducted or promoted is to engage in any lawful act or activity for which corporations may be organized under the ~~General Corporation Law of the State of Delaware~~DGCL.

## ARTICLE IV

~~Effective upon filing of this Third Amended and Restated Certificate of Incorporation, with the Secretary of State of the State of Delaware (the "Effective Time"), each 12.4 shares of the Corporation's Common Stock, par value \$0.001 per share, issued and outstanding (the "Old Common Stock"), will be automatically reclassified as and converted into one share of Common Stock, par value \$0.001 per share (the "New Common Stock") of the Corporation. No fractional shares of New Common Stock of the Corporation will be issued. As soon as practicable following the Effective Time, the Corporation will notify its shareholders of record as of the Effective Time to transmit outstanding share certificates to the Corporation's exchange agent and registrar ("Exchange Agent") and the Corporation will cause the Exchange Agent to issue new certificates or book entries representing one share of common stock for every 12.4 shares transmitted and held of record as of the Effective Time; and in settlement of fractional interests that might arise as a result of such combination as of the Effective Time, cause the Exchange Agent to disburse to such holders a cash payment in an amount equal to the product obtained by multiplying (i) the~~

~~fair market value of the Corporation's Common Stock on the day of the Effective Time as determined by the Board of Directors in its sole discretion by (ii) the number of shares of the Corporation's Common Stock held by a holder that would otherwise have been exchanged for a fractional share interest, as determined by the Board.~~

The total number of shares that the Corporation shall have authority to issue, ~~after taking into account the reverse stock split, is 55,000,000 (fifty-five million)~~ **105,000,000 (one hundred five million)**, consisting of (i) ~~50,000,000 (fifty million)~~ **100,000,000 (one hundred million)** shares of common stock, \$~~0.001~~ **0.001** par value per share, and (ii) 5,000,000 (five million) shares of preferred stock, \$~~0.001~~ **0.001** par value per share.

The board of directors is authorized to issue the preferred stock, subject to limitations prescribed by law and the provisions of this Certificate of Incorporation, as shares of preferred stock in **one or more** series, and is authorized, by filing a certificate of designation pursuant to the applicable law of the State of Delaware, to establish from time to time the number of shares to be included in each such series, and to fix the designation, powers, preferences and rights of the shares of each such series and qualifications, limitations or restrictions thereof. The authority of the board of directors with respect to each series shall include, but not be limited to, determination of the following:

- (i) the number of shares constituting that series and the distinctive designation of that series;
- (ii) the dividend rate, ~~if any~~, on the shares of that series, whether dividends shall be cumulative, and, if so, from which date or dates, and the relative rights of priority, if any, of payment of dividends on shares of that series;
- (iii) whether that series shall have voting rights **or powers**, in addition to the voting rights **and powers** provided by law, and, if so, the terms of such rights;
- (iv) whether that series shall have conversion ~~privileges~~ **rights**, and, if so, the terms and conditions of such conversion, including provisions for adjustment of the conversion rate in such events as the board of directors shall determine;
- (v) whether or not the shares of that series shall be redeemable, and, if so, the terms and conditions of such redemption, including the dates or dates upon or after which they shall be redeemable, and the amount per share payable in case of redemption, which amount may vary under different conditions and at different redemption dates;
- (vi) whether that series shall have a sinking fund for the redemption or purchase of shares of that series, and, if so, the terms and amounts of such sinking fund;
- (vii) the rights of the shares of that series in the event of voluntary or involuntary liquidation, dissolution or winding up of the Corporation, and the relative rights of priority, if any, of payment of shares of that series; and
- (viii) any other rights, preferences and limitations of that series.

The board of directors, within the limits and restrictions stated in any resolution or resolutions of the board of directors originally fixing the number of shares constituting any series, may increase or decrease (but not below the number of shares of such series then outstanding) the number of shares of any series subsequent to the issue of shares of that series.

#### ARTICLE V

~~Unless and except that the bylaws of the Corporation shall so require, the election of directors of the Corporation need not be by written ballot.~~

**Subject to all the rights, powers and preferences of the preferred stock and except as otherwise required by law or provided in this Certificate of Incorporation (including in any certificate of designations of any series of preferred stock):**

**(a) the holders of the common stock shall have the exclusive right to vote for the election of directors of the Corporation and on all other matters requiring stockholder action, each outstanding share entitling the holder thereof to one vote on each matter properly submitted to the stockholders of the Corporation for their vote;**

**(b) dividends may be declared and paid or set apart for payment upon the common stock out of any assets or funds of the Corporation legally available for the payment of dividends, but only when and as declared by the board of directors or any authorized committee thereof; and**

**(c) upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the net assets of the Corporation shall be distributed pro rata to the holders of the common stock.**

#### ARTICLE VI

~~Effective upon the registration of any class of the Corporation's stock under the Securities Act of 1934, as amended, any~~ **Any** action required or permitted to be taken by the stockholders of the Corporation must be effected at a duly called annual or special meeting of the stockholders of the Corporation and may not be effected by any consent in writing by such stockholders.

#### ARTICLE VII

~~Special~~ **Except as otherwise required by statute and subject to the rights, if any, of the holders of any series of preferred stock, special** meetings of the stockholders may be called, at any time for any purpose or purposes, by the board of directors, or by such person or persons duly designated by the board of directors whose powers and authority, as expressly provided in a resolution of the board of directors, include the power to call such meetings, but such special meetings may not be called by any other person or persons.

#### ARTICLE VIII

**8.1 General. The business and affairs of the Corporation shall be managed by or under the direction of the board of directors except as otherwise provided herein or required by law.**

**8.2 Election of directors. Unless and except that the bylaws of the Corporation shall so require, the election of directors need not be by written ballot.**

**8.3 Vacancies.** Any director may resign at any time upon notice given in writing or electronic transmission to the Corporation. When one or more directors so resigns and the resignation is effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective, and each director so chosen shall hold office as provided in this paragraph in the filling of other vacancies.

Vacancies and newly created directorships resulting from any increase in the authorized number of directors elected by all of the stockholders having the right to vote as a single class may be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director.

Whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of this Certificate of Incorporation, vacancies and newly created directorships of such class or classes or series may be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected.

**Any director appointed in accordance with this Section 8.3 shall hold office for the remainder of the full term of the director in which the new directorship was created or the vacancy occurred and until such director's successor shall have been duly elected and qualified or until his or her earlier resignation, death or removal.**

#### ARTICLE IX

To the fullest extent permitted by the ~~Delaware General Corporation Law~~ **DGCL**, as the same exists or as may hereafter be amended, no present or former director of the Corporation shall be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director **except for liability (a) for any breach of the director's duty of loyalty to the Corporation or its stockholders, (b) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (c) unlawful payments of dividends or unlawful stock repurchases or redemptions under Section 174 of the DGCL or (d) for any transaction from which the director derived an improper personal benefit. If the DGCL is amended after the effective date of this Certificate of Incorporation to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the DGCL, as so amended.** Neither any

amendment nor repeal of this Article, nor the adoption of any provision of this Certificate of Incorporation inconsistent with this Article, shall eliminate or reduce the effect of this Article in respect of any matter occurring, or any cause of action, suit or claim that, but for this Article, would accrue or arise, prior to such amendment, repeal or adoption of an inconsistent provision.

ARTICLE X

The Corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to, or testifies in, any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative in nature, by reason of the fact such person is or was a director, officer or employee or agent of the Corporation, or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, employee benefit plan, trust or other enterprise; against expenses (including attorney's fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding to the full extent permitted by law, and the Corporation may adopt bylaws or enter into agreements with any such person for the purpose of providing for such indemnification.

ARTICLE XI

The Corporation reserves the right at any time, and from time to time, to amend, alter, change or repeal any provision contained in this Certificate of Incorporation, and other provisions authorized by the laws of the State of Delaware at the time in force may be added or inserted, in the manner now or hereafter prescribed by law; and all rights, preferences, powers and privileges of whatsoever nature conferred upon stockholders, directors or any other persons whomsoever by and pursuant to this Certificate of Incorporation in its present form or as hereafter amended are granted subject to the rights reserved in this article.

ARTICLE XII

In furtherance and not in limitation of the powers conferred by the laws of the State of Delaware, the board of directors of the Corporation is expressly authorized to make, alter and repeal the bylaws of the Corporation; ~~subject to the power of the stockholders of the Corporation to alter or repeal any bylaw whether adopted by them or otherwise.~~

**IN WITNESS WHEREOF**, the undersigned has signed this **Fourth** Amended and Restated Certificate of Incorporation this 10<sup>th</sup> day of November 2010, **20**.

By: \_\_\_\_\_  
Name:  
Title:



**Appendix B**  
**Assembly Biosciences, Inc. 2018 Stock Incentive Plan**

**ASSEMBLY BIOSCIENCES, INC.**

**2018 STOCK INCENTIVE PLAN**

1. Purposes of the Plan. The purposes of this Plan are to attract and retain the best available personnel, to provide additional incentives to Employees, Directors and Consultants and to promote the success of the Company's business.

2. Definitions. The following definitions shall apply as used herein and in the individual Award Agreements except as defined otherwise in an individual Award Agreement. In the event a term is separately defined in an individual Award Agreement, such definition shall supersede the definition contained in this Section 2.

(a) "**Administrator**" means the Board or any of the Committees appointed to administer the Plan.

(b) "**Affiliate**" and "**Associate**" shall have the respective meanings ascribed to such terms in Rule 12b-2 promulgated under the Exchange Act.

(c) "**Applicable Laws**" means the legal requirements relating to the Plan and the Awards under applicable provisions of federal and state securities laws, the corporate laws of California and, to the extent other than California, the corporate law of the state of the Company's incorporation, the Code, the rules of any applicable stock exchange or national market system, and the rules of any non-U.S. jurisdiction applicable to Awards granted to residents therein.

(d) "**Assumed**" means that pursuant to a Corporate Transaction either (i) the Award is expressly affirmed by the Company or (ii) the contractual obligations represented by the Award are expressly assumed (and not simply by operation of law) by the successor entity or its Parent in connection with the Corporate Transaction with appropriate adjustments to the number and type of securities of the successor entity or its Parent subject to the Award and the exercise or purchase price thereof which at least preserves the compensation element of the Award existing at the time of the Corporate Transaction as determined in accordance with the instruments evidencing the agreement to assume the Award.

(e) "**Award**" means the grant of an Option, SAR, Dividend Equivalent Right, Restricted Stock, Restricted Stock Unit, Unrestricted Stock or other right or benefit under the Plan.

(f) "**Award Agreement**" means the written agreement evidencing the grant of an Award executed by the Company and the Grantee, including any amendments thereto.

(g) "**Board**" means the Board of Directors of the Company.

(h) "**Cause**" means, with respect to the termination by the Company or a Related Entity of the Grantee's Continuous Service, that such termination is for "Cause" as such term (or word of like import) is expressly defined in a then-effective written agreement between the Grantee and the Company or such Related Entity, or in the absence of such then-effective written agreement and definition, is based on, in the determination of the Administrator, the Grantee's: (i) performance of any act or failure to perform any act in bad faith and to the detriment of the Company or a Related Entity; (ii) dishonesty, intentional misconduct or material breach of any agreement with the Company or a Related Entity; or (iii) commission of a crime involving dishonesty, breach of trust, or physical or emotional harm to any person; provided, however, that with regard to any agreement that defines "Cause" on the occurrence of or in connection with a Corporate Transaction, such definition of "Cause" shall not apply until a Corporate Transaction actually occurs.

(i) "**Code**" means the Internal Revenue Code of 1986, as amended, or any successor statute.

(j) "**Committee**" means any committee composed of members of the Board appointed by the Board to administer the Plan.

(k) "**Common Stock**" means the Company's Common Stock, par value \$0.001 per share.

(l) “**Company**” means Assembly Biosciences, Inc., a Delaware corporation, formerly known as Ventrus Biosciences, Inc., or any successor entity that adopts the Plan in connection with a Corporate Transaction.

(m) “**Consultant**” means any natural person (other than an Employee or a Director, solely with respect to rendering services in such person’s capacity as a Director) who provides bona fide services to the Company or any Related Entity, within the meaning of Form S-8 promulgated under the Securities Act of 1933, as amended, and provided, further, that a Consultant will include only those persons to whom the issuance of Shares may be registered under Form S-8 promulgated under the Securities Act of 1933, as amended.

(n) “**Continuous Service**” means that the provision of services to the Company or a Related Entity in any capacity of Employee, Director or Consultant is not interrupted or terminated. In jurisdictions requiring notice in advance of an effective termination as an Employee, Director or Consultant, Continuous Service shall be deemed terminated upon the actual cessation of providing services to the Company or a Related Entity notwithstanding any required notice period that must be fulfilled before a termination as an Employee, Director or Consultant can be effective under Applicable Laws. A Grantee’s Continuous Service shall be deemed to have terminated either upon an actual termination of Continuous Service or upon the entity for which the Grantee provides services ceasing to be a Related Entity. Continuous Service shall not be considered interrupted in the case of (i) any approved leave of absence, (ii) transfers among the Company, any Related Entity, or any successor in any capacity of Employee, Director or Consultant, or (iii) any change in status as long as the individual remains in the service of the Company or a Related Entity in any capacity of Employee, Director or Consultant (except as otherwise provided in the Award Agreement). An approved leave of absence shall include sick leave, military leave, or any other authorized personal leave. For purposes of each Incentive Stock Option granted under the Plan, if such leave exceeds three (3) months, and reemployment upon expiration of such leave is not guaranteed by statute or contract, then the Incentive Stock Option shall be treated as a Non-Qualified Stock Option on the day three (3) months and one (1) day following the expiration of such three (3) month period.

(o) “**Corporate Transaction**” means any of the following transactions, provided, however, that the Administrator shall determine under parts (iv) and (v) whether multiple transactions are related, and its determination shall be final, binding and conclusive:

(i) a merger or consolidation in which the Company is not the surviving entity, except for a transaction the principal purpose of which is to change the state in which the Company is incorporated;

(ii) the sale, transfer or other disposition of all or substantially all of the assets of the Company;

(iii) the complete liquidation or dissolution of the Company;

(iv) any reverse merger or series of related transactions culminating in a reverse merger (including, but not limited to, a tender offer followed by a reverse merger) in which the Company is the surviving entity but (A) the shares of Common Stock outstanding immediately prior to such merger are converted or exchanged by virtue of the merger into other property, whether in the form of securities, cash or otherwise, or (B) in which securities possessing more than fifty percent (50%) of the total combined voting power of the Company’s outstanding securities are transferred to a person or persons different from those who held such securities immediately prior to such merger or the initial transaction culminating in such merger; or

(v) acquisition in a single or series of related transactions by any person or related group of persons (other than the Company or by a Company-sponsored employee benefit plan) of beneficial ownership (within the meaning of Rule 13d-3 of the Exchange Act) of securities possessing more than fifty percent (50%) of the total combined voting power of the Company’s outstanding securities.

(q) “**Director**” means a member of the Board or the board of directors of any Related Entity.

(r) “**Disability**” shall have the meaning set forth in the long-term disability policy of the Company or the Related Entity to which the Grantee provides services regardless of whether the Grantee is covered by such policy. If the Company or the Related Entity to which the Grantee provides service does not have a long-term disability plan in place, “Disability” means that a Grantee is unable to carry out the responsibilities and functions of the position held by the Grantee by reason of any medically determinable physical or mental impairment for a period of not less than ninety (90) consecutive days. A Grantee will not be considered to have incurred a Disability unless he or she furnishes proof of such impairment sufficient to satisfy the Administrator in its discretion.

(s) “**Disqualifying Disposition**” means any disposition (including any sale) of Common Stock received upon exercise of an Incentive Stock Option before either (i) two (2) years after the date the Employee was granted the Incentive Stock Option, or (ii) one (1) year after the date the Employee acquired Common Stock by exercising the Incentive Stock Option. If the Employee has died before such stock is sold, these holding period requirements do not apply and no Disqualifying Disposition can occur thereafter.

(t) “**Dividend Equivalent Right**” means a right entitling the Grantee to compensation measured by dividends paid with respect to Common Stock.

(u) “**Employee**” means any person, including an Officer or Director, who is in the employ of the Company or any Related Entity, subject to the control and direction of the Company or any Related Entity as to both the work to be performed and the manner and method of performance. The payment of a director’s fee by the Company or a Related Entity shall not be sufficient to constitute “employment” by the Company.

(v) “**Exchange Act**” means the Securities Exchange Act of 1934, as amended.

(w) “**Fair Market Value**” means, as of any date, the value of Common Stock determined as follows.

(i) If the Common Stock is listed on one or more established stock exchanges or national market systems, including without limitation The NASDAQ Global Select Market, The NASDAQ Global Market or The NASDAQ Capital Market of The NASDAQ Stock Market LLC, its Fair Market Value shall be the closing sales price for such stock (or the closing bid, if no sales were reported) as quoted on the principal exchange or system on which the Common Stock is listed (as determined by the Administrator) on the date of determination (or, if no closing sales price or closing bid was reported on that date, as applicable, on the last trading date such closing sales price or closing bid was reported), as reported in The Wall Street Journal or such other source as the Administrator deems reliable;

(ii) If the Common Stock is regularly quoted on an automated quotation system (including the OTC Bulletin Board) or by a recognized securities dealer, its Fair Market Value shall be the closing sales price for such stock as quoted on such system or by such securities dealer on the date of determination, but if selling prices are not reported, the Fair Market Value of a share of Common Stock shall be the mean between the high bid and low asked prices for the Common Stock on the date of determination (or, if no such prices were reported on that date, on the last date such prices were reported), as reported in The Wall Street Journal or such other source as the Administrator deems reliable; or

(iii) In the absence of an established market for the Common Stock of the type described in (i) and (ii), above, the Fair Market Value thereof shall be determined by the Administrator in a manner in compliance with Section 409A of the Code, and in the case of an Incentive Stock Option, in a manner in compliance with Section 422 of the Code.

(x) “**Grantee**” means an Employee, Director or Consultant who receives an Award under the Plan.

(y) “**Incentive Stock Option**” means an Option designated and qualified as an incentive stock option within the meaning of Section 422 of the Code.

(z) “**Non-Qualified Stock Option**” means an Option that is not an Incentive Stock Option.

(aa) “**Officer**” means a person who is an officer of the Company or a Related Entity within the meaning of Section 16 of the Exchange Act and the rules and regulations promulgated thereunder.

(bb) “**Option**” means an option to purchase Shares pursuant to an Award Agreement granted under the Plan.

(cc) “**Parent**” means a “parent corporation,” whether now or hereafter existing, as defined in Section 424(e) of the Code.

(dd) “**Plan**” means this Assembly Biosciences, Inc. 2018 Stock Incentive Plan.

(ee) “**Post-Termination Exercise Period**” means the period specified in the Award Agreement of not less than thirty (30) days commencing on the date of termination (other than termination by the Company or any Related Entity for Cause) of the Grantee’s Continuous Service, or such longer period as may be applicable upon death or Disability.

(ff) “**Related Entity**” means any Parent or Subsidiary of the Company.

(gg) “**Replaced**” means that pursuant to a Corporate Transaction the Award is replaced with a comparable stock award or a cash incentive program of the Company, the successor entity (if applicable) or Parent of either of them which preserves the compensation element of such Award existing at the time of the Corporate Transaction and provides for subsequent payout in accordance with the same (or a more favorable) vesting schedule applicable to such Award. The determination of Award comparability shall be made by the Administrator and its determination shall be final, binding and conclusive.

(hh) “**Restricted Stock**” means Shares issued under the Plan to the Grantee for such consideration, if any, and subject to such restrictions on transfer, rights of first refusal, repurchase provisions, forfeiture provisions, and other terms and conditions as established by the Administrator.

(ii) “**Restricted Stock Units**” means an Award which may be earned in whole or in part upon the passage of time or the attainment of performance criteria established by the Administrator and which may be settled for cash, Shares or other securities or a combination of cash, Shares or other securities as established by the Administrator.

(jj) “**Rule 16b-3**” means Rule 16b-3 promulgated under the Exchange Act or any successor thereto.

(kk) “**SAR**” means a stock appreciation right entitling the Grantee to Shares or cash compensation, as established by the Administrator, measured by appreciation in the value of Common Stock.

(ll) “**Share**” means a share of the Common Stock.

(mm) “**Subsidiary**” means a “subsidiary corporation,” whether now or hereafter existing, as defined in Section 424(f) of the Code.

(nn) “**Unrestricted Stock**” means an award of Shares free from any risks of forfeiture.

### 3. Stock Subject to the Plan.

(a) Subject to the provisions of Sections 3(b) and 12 below, the maximum aggregate number of Shares which may be issued pursuant to all Awards (including Incentive Stock Options) is One Million Nine Hundred Thousand (1,900,000) Shares. The Shares granted under the Plan may be authorized, but unissued, or reacquired Common Stock.

(b) Any Shares covered by an Award (or portion of an Award) which is forfeited, canceled or expires (whether voluntarily or involuntarily) shall be deemed not to have been issued for purposes of determining the maximum aggregate number of Shares which may be issued under the Plan, except that the maximum aggregate number of Shares which may be issued pursuant to the exercise of Incentive Stock Options shall not exceed the number specified in Section 3(a). Shares that actually have been issued under the Plan pursuant to an Award shall not be returned to the Plan and shall not become available for future issuance under the Plan, except that if Options or other Awards granted under this Plan or the Company’s Amended and Restated 2014 Stock Incentive Plan (the “**2014 Plan**”)

are forfeited or repurchased by the Company, such Shares shall become available for future grant under the Plan. In the event any Option or other Award granted under the Plan or the 2014 Plan is exercised through the tendering of shares of Common Stock (either actually or through attestation) or withholding shares of Common Stock, or in the event tax withholding obligations are satisfied by tendering or withholding shares of Common Stock, any shares of Common Stock so tendered or withheld shall not again be available for awards under the Plan. Shares of Common Stock subject to an SAR granted pursuant to Section 6(k) of this Plan or the 2014 Plan that are not issued in connection with cash or stock settlement of the exercise of the SAR shall not again be available for award under the Plan. Shares of Common Stock reacquired by the Company on the open market or otherwise using cash proceeds from the exercise of Options shall not be available for awards under the Plan.

(c) Notwithstanding anything to the contrary in this Plan, the value of all Awards awarded under this Plan and all other cash compensation paid by the Company to any non-employee Director in any calendar year shall not exceed \$1,000,000. For the purpose of this limitation, the value of any Award shall be its grant date fair value, as determined in accordance with ASC 718 or successor provision but excluding the impact of estimated forfeitures related to service-based vesting provisions.

#### 4. Administration of the Plan.

##### (a) Plan Administrator.

(i) Administration with Respect to Directors and Officers. With respect to grants of Awards to Directors or Employees who are also Officers or Directors of the Company, the Plan shall be administered by (A) the Board or (B) a Committee designated by the Board, which Committee shall be constituted in such a manner as to satisfy the Applicable Laws and to permit such grants and related transactions under the Plan to be exempt from Section 16(b) of the Exchange Act in accordance with Rule 16b-3. Once appointed, such Committee shall continue to serve in its designated capacity until otherwise directed by the Board.

(ii) Administration With Respect to Consultants and Other Employees. With respect to grants of Awards to Employees or Consultants who are neither Directors nor Officers of the Company, the Plan shall be administered by (A) the Board or (B) a Committee designated by the Board, which Committee shall be constituted in such a manner as to satisfy the Applicable Laws. Once appointed, such Committee shall continue to serve in its designated capacity until otherwise directed by the Board.

(b) Multiple Administrative Bodies. The Plan may be administered by different bodies with respect to Directors, Officers, Consultants, and Employees who are neither Directors nor Officers.

(c) Powers of the Administrator. Subject to Applicable Laws and the provisions of the Plan (including any other powers given to the Administrator hereunder), and except as otherwise provided by the Board, the Administrator shall have the authority, in its discretion:

- (i) to select the Employees, Directors and Consultants to whom Awards may be granted from time to time hereunder;
- (ii) to determine whether and to what extent Awards are granted hereunder;
- (iii) to determine the number of Shares or the amount of other consideration to be covered by each Award granted hereunder;
- (iv) to approve forms of Award Agreements for use under the Plan;
- (v) to determine the type, terms and conditions of any Award granted hereunder;
- (vi) to establish additional terms, conditions, rules or procedures to accommodate the rules or laws of applicable non-U.S. jurisdictions and to afford Grantees favorable treatment under such rules or laws; provided, however, that no Award shall be granted under any such additional terms, conditions, rules or procedures with terms or conditions which are inconsistent with the provisions of the Plan;

(vii) to amend the terms of any outstanding Award granted under the Plan, provided that any amendment that would adversely affect the Grantee's rights under an outstanding Award shall not be made without the Grantee's written consent; provided, however, that an amendment or modification that may cause an Incentive Stock Option to become a Non-Qualified Stock Option shall not be treated as adversely affecting the rights of the Grantee;

(viii) to construe and interpret the terms of the Plan and Awards, including without limitation, any notice of award or Award Agreement, granted pursuant to the Plan;

(ix) to institute an option exchange program; and

(x) to take such other action, not inconsistent with the terms of the Plan, as the Administrator deems appropriate.

The express grant in the Plan of any specific power to the Administrator shall not be construed as limiting any power or authority of the Administrator; provided that the Administrator may not exercise any right or power reserved to the Board. Any decision made, or action taken, by the Administrator or in connection with the administration of this Plan shall be final, conclusive and binding on all persons having an interest in the Plan.

(d) Indemnification. In addition to such other rights of indemnification as they may have as members of the Board or as Officers or Employees of the Company or a Related Entity, members of the Board and any Officers or Employees of the Company or a Related Entity to whom authority to act for the Board, the Administrator or the Company is delegated shall be defended and indemnified by the Company to the extent permitted by law on an after-tax basis against all reasonable expenses, including attorneys' fees, actually and necessarily incurred in connection with the defense of any claim, investigation, action, suit or proceeding, or in connection with any appeal therein, to which they or any of them may be a party by reason of any action taken or failure to act under or in connection with the Plan, or any Award granted hereunder, and against all amounts paid by them in settlement thereof (provided such settlement is approved by the Company) or paid by them in satisfaction of a judgment in any such claim, investigation, action, suit or proceeding, except in relation to matters as to which it shall be adjudged in such claim, investigation, action, suit or proceeding that such person is liable for gross negligence, bad faith or intentional misconduct; provided, however, that within thirty (30) days after the institution of such claim, investigation, action, suit or proceeding, such person shall offer to the Company, in writing, the opportunity at the Company's expense to defend the same.

5. Eligibility. Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants of the Company and any Related Entity. Incentive Stock Options may be granted only to Employees of the Company or a Parent or a Subsidiary of the Company. An Employee, Director or Consultant who has been granted an Award may, if otherwise eligible, be granted additional Awards. Awards may be granted to such Employees, Directors or Consultants who are residing in non-U.S. jurisdictions as the Administrator may determine from time to time.

#### 6. Terms and Conditions of Awards.

(a) Types of Awards. The Administrator is authorized under the Plan to award any type of arrangement to an Employee, Director or Consultant that is not inconsistent with the provisions of the Plan and that by its terms involves or might involve the issuance of (i) Shares, (ii) cash or (iii) an Option, an SAR, or similar right with a fixed or variable price related to the Fair Market Value of the Shares and with an exercise or conversion privilege related to the passage of time, the occurrence of one or more events, or the satisfaction of performance criteria or other conditions. Such awards include, without limitation, Options, SARs, sales or bonuses of Restricted Stock, Restricted Stock Units, Unrestricted Stock or Dividend Equivalent Rights, and an Award may consist of one (1) such security or benefit, or two (2) or more of them in any combination or alternative. Unrestricted Stock may be granted in respect of past services or other valid consideration, or in lieu of cash compensation due to the grantee.

(b) Designation of Award. Each Award shall be designated in the Award Agreement. In the case of an Option, the Option shall be designated as either an Incentive Stock Option or a Non-Qualified Stock Option. However, notwithstanding such designation, an Option will qualify as an Incentive

Stock Option under the Code only to the extent the \$100,000 dollar limitation of Section 422(d) of the Code is not exceeded. The \$100,000 limitation of Section 422(d) of the Code is calculated based on the aggregate Fair Market Value of the Shares subject to Options designated as Incentive Stock Options which become exercisable for the first time by a Grantee during any calendar year (under all plans of the Company or any Parent or Subsidiary of the Company). For purposes of this calculation, Incentive Stock Options shall be taken into account in the order in which they were granted, and the Fair Market Value of the Shares shall be determined as of the grant date of the relevant Option.

(c) Conditions of Award. Subject to the terms of the Plan, the Administrator shall determine the provisions, terms, and conditions of each Award including, but not limited to, the Award vesting schedule, repurchase provisions, rights of first refusal, forfeiture provisions, form of payment (cash, Shares, or other consideration) upon settlement of the Award, payment contingencies, and satisfaction of any performance criteria. The performance criteria established by the Administrator may be based on any one of, or combination of, increase in share price, earnings per share, total stockholder return, return on equity, return on assets, return on investment, net operating income, cash flow, revenue, economic value added, initiation or completion of clinical trials, results of clinical trials, regulatory approval, regulatory submissions, drug development or commercialization milestones, collaboration milestones or strategic partnerships. Partial achievement of the specified criteria may result in a payment or vesting corresponding to the degree of achievement as specified in the Award Agreement.

(d) Acquisitions and Other Transactions. The Administrator may issue Awards under the Plan in settlement, assumption or substitution for, outstanding awards or obligations to grant future awards in connection with the Company or a Related Entity acquiring another entity, an interest in another entity or an additional interest in a Related Entity whether by merger, stock purchase, asset purchase or other form of transaction.

(e) Deferral of Award Payment. The Administrator may establish one or more programs under the Plan to permit selected Grantees the opportunity to elect to defer receipt of consideration upon exercise of an Award, satisfaction of performance criteria, or other event that absent the election would entitle the Grantee to payment or receipt of Shares or other consideration under an Award. The Administrator may establish the election procedures, the timing of such elections, the mechanisms for payments of, and accrual of interest or other earnings, if any, on amounts, Shares or other consideration so deferred, and such other terms, conditions, rules and procedures that the Administrator deems advisable for the administration of any such deferral program.

(f) Separate Programs. The Administrator may establish one or more separate programs under the Plan for the purpose of issuing particular forms of Awards to one or more classes of Grantees on such terms and conditions as determined by the Administrator from time to time.

(g) Early Exercise. The Award Agreement may, but need not, include a provision whereby the Grantee may elect at any time while an Employee, Director or Consultant to exercise any part or all of the Award prior to full vesting of the Award. Any unvested Shares received pursuant to such exercise may be subject to a repurchase right in favor of the Company or a Related Entity or to any other restriction the Administrator determines to be appropriate.

(h) Term of Option or SAR. The term of each Option or SAR shall be the term stated in the Award Agreement, provided, however, that the term shall be no more than ten (10) years from the date of grant thereof. However, in the case of an Incentive Stock Option granted to a Grantee who, at the time the Option is granted, owns stock representing more than ten percent (10%) of the voting power of all classes of stock of the Company or any Parent or Subsidiary of the Company, the term of the Incentive Stock Option shall be five (5) years from the date of grant thereof or such shorter term as may be provided in the Award Agreement.

(i) Transferability of Awards. Unless the Administrator provides otherwise, in its sole discretion, no Award may be sold, pledged, assigned, hypothecated, transferred, or disposed of in any manner other than by will or by the laws of descent or distribution and may be exercised, during the lifetime of the Grantee, only by the Grantee. Notwithstanding the foregoing, the Grantee may designate one or more beneficiaries of the Grantee's Award in the event of the Grantee's death on a beneficiary designation form provided by the Administrator.

(j) Time of Granting Awards. The date of grant of an Award shall for all purposes be the date on which the Administrator makes the determination to grant such Award, or such other later date as is determined by the Administrator.

(k) Stock Appreciation Rights. An SAR may be granted (i) with respect to any Option granted under this Plan, either concurrently with the grant of such Option or at such later time as determined by the Administrator (as to all or any portion of the shares of Common Stock subject to the Option), or (ii) alone, without reference to any related Option. Each SAR granted by the Administrator under this Plan shall be subject to the following terms and conditions. Each SAR granted to any participant shall relate to such number of shares of Common Stock as shall be determined by the Administrator, subject to adjustment as provided in Section 12. In the case of an SAR granted with respect to an Option, the number of shares of Common Stock to which the SAR pertains shall be reduced in the same proportion that the holder of the Option exercises the related Option. The exercise price of an SAR will be determined by the Administrator, in its discretion, at the date of grant but may not be less than one hundred percent (100%) of the Fair Market Value of the shares of Common Stock subject thereto on the date of grant. Subject to the right of the Administrator to deliver cash in lieu of shares of Common Stock (which, as it pertains to Officers and Directors of the Company, shall comply with all requirements of the Exchange Act), the number of shares of Common Stock which shall be issuable upon the exercise of an SAR shall be determined by dividing:

(i) the number of shares of Common Stock as to which the SAR is exercised multiplied by the amount of the appreciation in such shares (for this purpose, the “appreciation” shall be the amount by which the Fair Market Value of the shares of Common Stock subject to the SAR on the exercise date exceeds (1) in the case of an SAR related to an Option, the exercise price of the shares of Common Stock under the Option or (2) in the case of an SAR granted alone, without reference to a related Option, an amount which shall be determined by the Administrator at the time of grant, subject to adjustment under Section 12); by

(ii) the Fair Market Value of a share of Common Stock on the exercise date.

In lieu of issuing shares of Common Stock upon the exercise of an SAR, the Administrator may elect to pay the holder of the SAR cash equal to the Fair Market Value on the exercise date of any or all of the shares which would otherwise be issuable. No fractional shares of Common Stock shall be issued upon the exercise of an SAR; instead, the holder of the SAR shall be entitled to receive a cash adjustment equal to the same fraction of the Fair Market Value of a share of Common Stock on the exercise date or to purchase the portion necessary to make a whole share at its Fair Market Value on the date of exercise. The exercise of an SAR related to an Option shall be permitted only to the extent that the Option is exercisable under Section 10 on the date of surrender. Any Incentive Stock Option surrendered pursuant to the provisions of this Section 6(k) shall be deemed to have been converted into a Non-Qualified Stock Option immediately prior to such surrender.

(l) Compliance with Section 409A of the Code. Notwithstanding anything to the contrary set forth herein, any Award that is not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Award will comply with the requirements of Section 409A of the Code. Such restrictions, if any, shall be determined by the Administrator and contained in the Award Agreement evidencing such Award.

(m) Minimum Vesting. Awards granted to Employees under the Plan that are subject to time vesting shall not vest or become exercisable until at least one year after the date of grant, except in the case of death, Disability, retirement, separation of service or a Corporate Transaction. Awards granted to Directors under the Plan that are subject to time vesting shall not vest or become exercisable until at least the earlier of (i) one year after the date of grant or (ii) the next annual meeting of stockholders, except in the case of death, Disability or a Corporate Transaction.



7. Award Exercise or Purchase Price, Consideration and Taxes.

(a) Exercise or Purchase Price. The exercise or purchase price, if any, for an Award shall be as follows.

(i) In the case of an Incentive Stock Option:

(1) granted to an Employee who, at the time of the grant of such Incentive Stock Option owns stock representing more than ten percent (10%) of the voting power of all classes of stock of the Company or any Parent or Subsidiary of the Company, the per Share exercise price shall be not less than one hundred ten percent (110%) of the Fair Market Value per Share on the date of grant; or

(2) granted to any Employee other than an Employee described in the preceding paragraph, the per Share exercise price shall be not less than one hundred percent (100%) of the Fair Market Value per Share on the date of grant.

(ii) In the case of a Non-Qualified Stock Option, the per Share exercise price shall be not less than one-hundred percent (100%) of the Fair Market Value per Share on the date of grant.

(iii) In the case of other Awards, such price as is determined by the Administrator.

(iv) Notwithstanding the foregoing provisions of this Section 7(a), in the case of an Award issued pursuant to Section 6(d), above, the exercise or purchase price for the Award shall be determined in accordance with the provisions of the relevant instrument evidencing the agreement to issue such Award.

(b) Consideration. Subject to Applicable Laws, the consideration to be paid for the Shares to be issued upon exercise or purchase of an Option or upon the issuance of another Award, including the method of payment, shall be determined by the Administrator. In addition to any other types of consideration the Administrator may determine, the Administrator is authorized to accept as consideration for Shares issued under the Plan the following:

(i) cash;

(ii) check;

(iii) delivery of Grantee's promissory note with such recourse, interest, security, and redemption provisions as the Administrator determines as appropriate (but only to the extent that the acceptance or terms of the promissory note would not violate an Applicable Law); provided, however, that interest shall compound at least annually and shall be charged at the minimum rate of interest necessary to avoid (i) the imputation of interest income to the Company and compensation income to the Grantee under any applicable provisions of the Code, and (B) the classification of the Award as a liability for financial accounting purposes;

(iv) surrender of Shares or delivery of a properly executed form of attestation of ownership of Shares as the Administrator may require which have a Fair Market Value on the date of surrender or attestation equal to the aggregate exercise price of the Shares as to which said Award shall be exercised;

(v) payment through a broker-dealer sale and remittance procedure pursuant to which the Grantee (A) shall provide written instructions to a Company designated brokerage firm to effect the immediate sale of some or all of the purchased Shares and remit to the Company sufficient funds to cover the aggregate exercise price payable for the purchased Shares and (B) shall provide written directives to the Company to deliver the certificates (or other evidence satisfactory to the Company to the extent that the Shares are uncertificated) for the purchased Shares directly to such brokerage firm in order to complete the sale transaction;

(vi) with respect to Non-Qualified Options, payment through a "net exercise" such that, without the payment of any funds, the Grantee may exercise the Option and receive the net number of Shares equal to (i) the number of Shares as to which the Option is being exercised, multiplied by (ii) a fraction, the numerator of which is the Fair Market Value per Share (on such date as is determined by the Administrator) less the Exercise Price per Share, and the denominator of which is such Fair Market Value per Share; or

- (vii) past or future services actually or to be rendered to the Company or a Related Entity; or
- (viii) any combination of the foregoing methods of payment.

The Administrator may at any time or from time to time, by adoption of or by amendment to the standard forms of Award Agreement described in Section 4(c)(iv), or by other means, grant Awards which do not permit all of the foregoing forms of consideration to be used in payment for the Shares or which otherwise restrict one or more forms of consideration.

8. Notice to Company of Disqualifying Disposition. Each Employee who receives an Incentive Stock Option must agree to notify the Company in writing immediately after the Employee makes a Disqualifying Disposition of any Common Stock acquired pursuant to the exercise of an Incentive Stock Option.

9. Withholding of Additional Income Taxes.

(a) Upon the exercise of a Non-Qualified Stock Option or SAR, the grant of any other Award for less than the Fair Market Value of the Common Stock, the grant of Unrestricted Stock or the vesting of restricted Common Stock acquired on the exercise of an Award hereunder, the Company, in accordance with Section 3402(a) of the Code and any applicable state statute or regulation, may require the Grantee to pay to the Company additional withholding taxes in respect of the amount that is considered compensation includable in such person's gross income. With respect to (i) the exercise of an Option, (ii) the grant of Unrestricted Stock, (iii) the grant of any other Award for less than its Fair Market Value, (iv) the vesting of restricted Common Stock acquired by exercising an Award, or (v) the exercise of an SAR, the Committee in its discretion may condition such event on the payment by the Grantee of any such additional withholding taxes.

(b) At the sole and absolute discretion of the Administrator, the holder of Awards may pay all or any part of the total estimated federal and state income tax liability arising out of the exercise or receipt of such Awards or the vesting of restricted Common Stock acquired on the exercise of an Award hereunder (each of the foregoing, a "*Tax Event*") by tendering already-owned shares of Common Stock or by directing the Company to withhold shares of Common Stock otherwise to be transferred to the Grantee as a result of the exercise or receipt thereof in an amount equal to the estimated federal and state income tax liability arising out of such event, provided that no more Shares may be withheld than are necessary to satisfy the Grantee's withholding obligation with respect to the exercise of Awards; provided, however, that the amount withheld does not exceed the maximum statutory tax rate or such lesser amount as is necessary to avoid liability accounting treatment for Awards granted under the Plan. In such event, the Grantee must, however, notify the Administrator of his or her desire to pay all or any part of the total estimated federal and state income tax liability arising out of a Tax Event by tendering already-owned shares of Common Stock or having shares of Common Stock withheld prior to the date that the amount of federal or state income tax to be withheld is to be determined. For purposes of this Section 9, shares of Common Stock shall be valued at their Fair Market Value on the date that the amount of the tax withholdings is to be determined.

10. Exercise of Award.

(a) Procedure for Exercise: Rights as a Stockholder.

(i) Any Award granted hereunder shall be exercisable at such times and under such conditions as determined by the Administrator under the terms of the Plan and specified in the Award Agreement.

(ii) An Award shall be deemed to be exercised when written notice of such exercise has been given to the Company in accordance with the terms of the Award by the person entitled to exercise the Award and full payment for the Shares with respect to which the Award is exercised has been made, including, to the extent selected, use of the broker-dealer sale and remittance procedure to pay the purchase price as provided in Section 7(b)(v).

(b) Exercise of Award Following Termination of Continuous Service. In the event of termination of a Grantee's Continuous Service for any reason other than Disability or death (but not in the event of a Grantee's change of status from Employee to Consultant or from Consultant to

Employee), such Grantee may, but only during the Post-Termination Exercise Period (but in no event later than the expiration date of the term of such Award as set forth in the Award Agreement), exercise the portion of the Grantee's Award that was vested at the date of such termination or such other portion of the Grantee's Award as may be determined by the Administrator. The Grantee's Award Agreement may provide that upon the termination of the Grantee's Continuous Service for Cause, the Grantee's right to exercise the Award shall terminate concurrently with the termination of Grantee's Continuous Service. In the event of a Grantee's change of status from Employee to Consultant, an Employee's Incentive Stock Option shall convert automatically to a Non-Qualified Stock Option on the day three (3) months and one (1) day following such change of status. To the extent that the Grantee's Award was unvested at the date of termination, or if the Grantee does not exercise the vested portion of the Grantee's Award within the Post-Termination Exercise Period, the Award shall terminate.

(c) Disability of Grantee. In the event of termination of a Grantee's Continuous Service as a result of his or her Disability, such Grantee may, but only within twelve (12) months from the date of such termination (or such longer period as specified in the Award Agreement but in no event later than the expiration date of the term of such Award as set forth in the Award Agreement), exercise the portion of the Grantee's Award that was vested at the date of such termination; provided, however, that if such Disability is not a "disability" as such term is defined in Section 22(e)(3) of the Code, in the case of an Incentive Stock Option such Incentive Stock Option shall automatically convert to a Non-Qualified Stock Option on the day three (3) months and one (1) day following such termination. To the extent that the Grantee's Award was unvested at the date of termination, or if Grantee does not exercise the vested portion of the Grantee's Award within the time specified herein, the Award shall terminate.

(d) Death of Grantee. In the event of a termination of the Grantee's Continuous Service as a result of his or her death, or in the event of the death of the Grantee during the Post-Termination Exercise Period or during the twelve (12) month period following the Grantee's termination of Continuous Service as a result of his or her Disability, the Grantee's estate or a person who acquired the right to exercise the Award by bequest or inheritance may exercise the portion of the Grantee's Award that was vested as of the date of termination, within twelve (12) months from the date of death (or such longer period as specified in the Award Agreement but in no event later than the expiration of the term of such Award as set forth in the Award Agreement). To the extent that, at the time of death, the Grantee's Award was unvested, or if the Grantee's estate or a person who acquired the right to exercise the Award by bequest or inheritance does not exercise the vested portion of the Grantee's Award within the time specified herein, the Award shall terminate.

(e) Extension if Exercise Prevented by Law. Notwithstanding the foregoing, if the exercise of an Award within the applicable time periods set forth in this Section 10 is prevented by the provisions of Section 11 below, the Award shall remain exercisable until one (1) month after the date the Grantee is notified by the Company that the Award is exercisable, but in any event no later than the expiration of the term of such Award as set forth in the Award Agreement.

#### 11. Conditions Upon Issuance of Shares.

(a) If at any time the Administrator determines that the delivery of Shares pursuant to the exercise, vesting or any other provision of an Award is or may be unlawful under Applicable Laws, the vesting or right to exercise an Award or to otherwise receive Shares pursuant to the terms of an Award shall be suspended until the Administrator determines that such delivery is lawful and shall be further subject to the approval of counsel for the Company with respect to such compliance. The Company shall have no obligation to effect any registration or qualification of the Shares under federal or state laws.

(b) As a condition to the exercise of an Award, the Company may require the person exercising such Award to represent and warrant at the time of any such exercise that the Shares are being purchased only for investment and without any present intention to sell or distribute such Shares if, in the opinion of counsel for the Company, such a representation is required by any Applicable Laws.

12. Adjustments. Subject to any required action by the stockholders of the Company, the number of Shares covered by each outstanding Award, and the number of Shares which have been authorized for issuance under the Plan but as to which no Awards have yet been granted or which have been returned to the Plan, the exercise or purchase price of each such outstanding Award, as well as any other terms that the Administrator determines require adjustment shall be proportionately adjusted for (i) any increase or decrease in the number of issued Shares resulting from a stock split, reverse stock split, stock dividend, combination or reclassification of the Shares, or similar transaction affecting the Shares, (ii) any other increase or decrease in the number of issued Shares effected without receipt of consideration by the Company, or (iii) any other transaction with respect to the Company's Common Stock including a corporate merger, consolidation, acquisition of property or stock, separation (including a spin-off or other distribution of stock or property), reorganization, liquidation (whether partial or complete) or any similar transaction; provided, however that conversion of any convertible securities of the Company shall not be deemed to have been "effected without receipt of consideration." Such adjustment shall be made by the Administrator and its determination shall be final, binding and conclusive. Except as the Administrator determines, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason hereof shall be made with respect to, the number or price of Shares subject to an Award. No adjustments shall be made for dividends paid in cash or in property other than Common Stock of the Company, nor shall cash dividends or dividend equivalents accrue or be paid in respect of unexercised Options or unvested Awards hereunder.

13. Corporate Transactions.

(a) Termination of Award to Extent Not Assumed in Corporate Transaction. Effective upon the consummation of a Corporate Transaction, all outstanding Awards under the Plan shall terminate. However, all such Awards shall not terminate to the extent they are Assumed in connection with the Corporate Transaction.

(b) Acceleration of Award Upon Corporate Transaction. The Administrator shall have the authority, exercisable either in advance of any actual or anticipated Corporate Transaction or at the time of an actual Corporate Transaction and exercisable at the time of the grant of an Award under the Plan or any time while an Award remains outstanding, to provide for the full or partial automatic vesting and exercisability of one or more outstanding unvested Awards under the Plan and the release from restrictions on transfer and repurchase or forfeiture rights of such Awards in connection with a Corporate Transaction on such terms and conditions as the Administrator may specify. The Administrator also shall have the authority to condition any such Award vesting and exercisability or release from such limitations upon the subsequent termination of the Continuous Service of the Grantee within a specified period following the effective date of the Corporate Transaction. The Administrator may provide that any Awards so vested or released from such limitations in connection with a Corporate Transaction shall remain fully exercisable until the expiration or sooner termination of the Award.

(c) Effect of Acceleration on Incentive Stock Options. Any Incentive Stock Option accelerated under this Section 13 in connection with a Corporate Transaction shall remain exercisable as an Incentive Stock Option under the Code only to the extent the \$100,000 dollar limitation of Section 422(d) of the Code is not exceeded.

14. Effective Date and Term of Plan. The Plan shall become effective upon the earlier to occur of its adoption by the Board or its approval by the stockholders of the Company. It shall continue in effect for a term of ten (10) years from the date of stockholder approval unless sooner terminated, provided that no incentive stock options may be granted under the Plan after April 5, 2028. Subject to Applicable Laws, Awards may be granted under the Plan upon Board approval, contingent on stockholder approval.

15. Amendment, Suspension or Termination of the Plan.

(a) The Board may at any time amend, suspend or terminate the Plan in any respect, except that it may not, without the approval of the stockholders obtained within twelve (12) months before or after the Board adopts a resolution authorizing any of the following actions, do any of the following:

(i) increase the total number of shares that may be issued under the Plan (except by adjustment pursuant to Section 12);

(ii) modify the provisions of Section 6 regarding eligibility for grants of ISOs may not be modified;

(iii) the provisions of Section 7(a) regarding the exercise price at which shares may be offered pursuant to Options may not be modified (except by adjustment pursuant to Section 12);

(iv) extend the expiration date of the Plan; and

(v) except as provided in Section 12 (including, without limitation, any stock dividend, stock split, extraordinary cash dividend, recapitalization, reorganization, merger, consolidation, split-up, spin-off, combination, or exchange of shares), the Company may not amend an Award granted under the Plan to reduce its exercise price per share, cancel and regrant new Awards with lower prices per share than the original prices per share of the cancelled Awards, or cancel any Awards in exchange for cash or the grant of replacement Awards with an exercise price that is less than the exercise price of the original Awards, essentially having the effect of a repricing, without approval by the Company's stockholders.

(b) No Award may be granted during any suspension of the Plan or after termination of the Plan.

(c) No suspension or termination of the Plan (including termination of the Plan under Section 15, above) shall adversely affect any rights under Awards already granted to a Grantee without his or her consent.

16. Reservation of Shares.

(a) The Company, during the term of the Plan, will at all times reserve and keep available such number of Shares as shall be sufficient to satisfy the requirements of the Plan.

(b) The inability of the Company to obtain authority from any regulatory body having jurisdiction, which authority is deemed by the Company's counsel to be necessary to the lawful issuance and sale of any Shares hereunder, shall relieve the Company of any liability in respect of the failure to issue or sell such Shares as to which such requisite authority shall not have been obtained.

17. No Effect on Terms of Employment/Consulting Relationship. The Plan shall not confer upon any Grantee any right with respect to the Grantee's Continuous Service, nor shall it interfere in any way with his or her right or the right of the Company or a Related Entity to terminate the Grantee's Continuous Service at any time, with or without Cause, and with or without notice. The ability of the Company or any Related Entity to terminate the employment of a Grantee who is employed at will is in no way affected by its determination that the Grantee's Continuous Service has been terminated for Cause for the purposes of this Plan.

18. No Effect on Retirement and Other Benefit Plans. Except as specifically provided in a retirement or other benefit plan of the Company or a Related Entity, Awards shall not be deemed compensation for purposes of computing benefits or contributions under any retirement plan of the Company or a Related Entity, and shall not affect any benefits under any other benefit plan of any kind or any benefit plan subsequently instituted under which the availability or amount of benefits is related to level of compensation. The Plan is not a "Retirement Plan" or "Welfare Plan" under the Employee Retirement Income Security Act of 1974, as amended.

19. Stockholder Approval. Continuance of the Plan shall be subject to approval by the stockholders of the Company within twelve (12) months before or after the date the Plan is adopted by the Board. Such stockholder approval shall be obtained in the degree and manner required under Applicable Laws. Any Award exercised before stockholder approval is obtained shall be rescinded if stockholder approval is not obtained within the time prescribed, and Shares issued on the exercise of any such Award shall not be counted in determining whether stockholder approval is obtained.

20. Electronic Delivery. The Administrator may, in its sole discretion, decide to deliver any documents related to any Award granted under the Plan through an online or electronic system established and maintained by the Company or another third party designated by the Company or to request a Grantee's consent to participate in the Plan by electronic means. Each Grantee hereunder consents to receive such documents by electronic delivery and agrees to participate in the Plan through an online or



**Appendix C**  
**Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan**

**2018 EMPLOYEE STOCK PURCHASE PLAN**

The purpose of the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan (“the Plan”) is to provide eligible employees of Assembly Biosciences, Inc. (the “Company”) and each Designated Subsidiary (as defined in Section 11) with opportunities to purchase shares of the Company’s common stock, par value \$0.001 per share (the “Common Stock”). An aggregate of 400,000 shares of Common Stock have been approved and reserved for this purpose.

The Plan includes two components: a Code Section 423 Component (the “423 Component”) and a non-Code Section 423 Component (the “Non-423 Component”). It is intended for the 423 Component to constitute an “employee stock purchase plan” within the meaning of Section 423(b) of the U.S. Internal Revenue Code of 1986, as amended (the “Code”) and the 423 Component shall be interpreted in accordance with that intent (although the Company makes no undertaking or representation to maintain such qualification). In addition, this Plan authorizes the grant of options under the Non-423 Component that does not qualify as an “employee stock purchase plan” under Section 423 of the Code. Except as otherwise provided herein, the Non-423 Component will operate and be administered in the same manner as the 423 Component.

1. Administration. The Plan will be administered by the person or persons (the “Administrator”) appointed by the Company’s Board of Directors (the “Board”) for such purpose. The Administrator has authority at any time to: (i) adopt, alter and repeal such rules, guidelines and practices for the administration of the Plan and for its own acts and proceedings as it shall deem advisable; (ii) interpret the terms and provisions of the Plan; (iii) make all determinations it deems advisable for the administration of the Plan; (iv) decide all disputes arising in connection with the Plan; and (v) otherwise supervise the administration of the Plan. All interpretations and decisions of the Administrator shall be binding on all persons, including the Company and the Participants. No member of the Board or individual exercising administrative authority with respect to the Plan shall be liable for any action or determination made in good faith with respect to the Plan or any option granted hereunder.

2. Offerings. The Company will make one or more offerings to eligible employees to purchase Common Stock under the Plan (“Offerings”). Unless otherwise determined by the Administrator, the initial Offering will begin on June 15, 2018 and will end on the following November 14<sup>th</sup> (the “Initial Offering”). Thereafter, unless otherwise determined by the Administrator, an Offering will begin on the first business day occurring on or after each November 15<sup>th</sup> and May 15<sup>th</sup> and will end on the last business day occurring on or before the following May 14<sup>th</sup> and November 14<sup>th</sup>, respectively. The Administrator may, in its discretion, designate a different period for any Offering, provided that no Offering shall exceed six months in duration or overlap any other Offering.

3. Eligibility. All individuals classified as employees on the payroll records of the Company and each Designated Subsidiary are eligible to participate in any one or more of the Offerings under the Plan, provided that as of the first day of the applicable Offering (the “Offering Date”) they are employed by the Company or a Designated Subsidiary and have completed at least 30 days of employment. Notwithstanding any other provision herein, individuals who are not contemporaneously classified as employees of the Company or a Designated Subsidiary for purposes of the Company’s or applicable Designated Subsidiary’s payroll system are not considered to be eligible employees of the Company or any Designated Subsidiary and shall not be eligible to participate in the Plan. In the event any such individuals are reclassified as employees of the Company or a Designated Subsidiary for any purpose, including, without limitation, common law or statutory employees, by any action of any third party, including, without limitation, any government agency, or as a result of any private lawsuit, action or administrative proceeding, such individuals shall, notwithstanding such reclassification, remain ineligible for participation. Notwithstanding the foregoing, the exclusive means for individuals who are not contemporaneously classified as employees of the Company or a Designated Subsidiary on the Company’s or Designated Subsidiary’s payroll system to become eligible to participate in this Plan is through an amendment to this Plan, duly executed by the Company, which specifically renders such individuals eligible to participate herein.

#### 4. Participation.

(a) An eligible employee who is not a Participant in any prior Offering may participate in a subsequent Offering by submitting an enrollment form to his or her appropriate payroll location at least 15 business days before the Offering Date (or by such other deadline as shall be established by the Administrator for the Offering).

(b) The enrollment form will (a) state a whole percentage to be deducted from an eligible employee's Compensation (as defined in Section 11) per pay period, (b) authorize the purchase of Common Stock in each Offering in accordance with the terms of the Plan and (c) specify the exact name or names in which shares of Common Stock purchased for such individual are to be issued pursuant to Section 10. An employee who does not enroll in accordance with these procedures will be deemed to have waived the right to participate. Unless a Participant files a new enrollment form or withdraws from the Plan, such Participant's deductions and purchases will continue at the same percentage of Compensation for future Offerings, provided he or she remains eligible.

(c) Notwithstanding the foregoing, participation in the Plan will neither be permitted nor be denied contrary to the requirements of the Code.

5. Employee Contributions. Each eligible employee may authorize payroll deductions at a minimum of one percent up to a maximum of 15 percent of such employee's Compensation for each pay period. The Company will maintain book accounts showing the amount of payroll deductions made by each Participant for each Offering. No interest will accrue or be paid on payroll deductions.

6. Deduction Changes. Except as may be determined by the Administrator in advance of an Offering, a Participant may not increase or decrease his or her payroll deduction during any Offering, but may increase or decrease his or her payroll deduction with respect to the next Offering (subject to the limitations of Section 5) by filing a new enrollment form at least 15 business days before the next Offering Date (or by such other deadline as shall be established by the Administrator for the Offering). The Administrator may, in advance of any Offering, establish rules permitting a Participant to increase, decrease or terminate his or her payroll deduction during an Offering.

7. Withdrawal. A Participant may withdraw from participation in the Plan by delivering a written notice of withdrawal to his or her appropriate payroll location. The Participant's withdrawal will be effective as of the next business day. Following a Participant's withdrawal, the Company will promptly refund such individual's entire account balance under the Plan to him or her (after payment for any Common Stock purchased before the effective date of withdrawal). Partial withdrawals are not permitted. Such an employee may not begin participation again during the remainder of the Offering, but may enroll in a subsequent Offering in accordance with Section 4.

8. Grant of Options. On each Offering Date, the Company will grant to each eligible employee who is then a Participant in the Plan an option ("Option") to purchase on the last day of such Offering (the "Exercise Date"), at the Option Price hereinafter provided for, the lowest of (a) a number of shares of Common Stock determined by dividing such Participant's accumulated payroll deductions on such Exercise Date by the Option Price (as defined herein), (b) 1,000 shares; or (c) such other lesser maximum number of shares as shall have been established by the Administrator in advance of the Offering; provided, however, that such Option shall be subject to the limitations set forth below. Each Participant's Option shall be exercisable only to the extent of such Participant's accumulated payroll deductions on the Exercise Date. The purchase price for each share purchased under each Option (the "Option Price") will be 85 percent of the Fair Market Value of the Common Stock on the Offering Date or the Exercise Date, whichever is less.

Notwithstanding the foregoing, no Participant may be granted an option hereunder if such Participant, immediately after the option was granted, would be treated as owning stock possessing five percent or more of the total combined voting power or value of all classes of stock of the Company or any Parent or Subsidiary (as defined in Section 11). For purposes of the preceding sentence, the attribution rules of Section 424(d) of the Code shall apply in determining the stock ownership of a Participant, and all stock which the Participant has a contractual right to purchase shall be treated as stock owned by the Participant. In addition, no Participant may be granted an Option which permits his or her rights to purchase stock under the Plan, and any other employee stock purchase plan of the Company and its



Parents and Subsidiaries, to accrue at a rate which exceeds \$25,000 of the fair market value of such stock (determined on the option grant date or dates) for each calendar year in which the Option is outstanding at any time. The purpose of the limitation in the preceding sentence is to comply with Section 423(b)(8) of the Code and shall be applied taking Options into account in the order in which they were granted.

9. Exercise of Option and Purchase of Shares. Each employee who continues to be a Participant in the Plan on the Exercise Date shall be deemed to have exercised his or her Option on such date and shall acquire from the Company such number of whole shares of Common Stock reserved for the purpose of the Plan as his or her accumulated payroll deductions on such date will purchase at the Option Price, subject to any other limitations contained in the Plan. Any amount remaining in a Participant's account at the end of an Offering solely by reason of the inability to purchase a fractional share will be carried forward to the next Offering; any other balance remaining in a Participant's account at the end of an Offering will be refunded to the Participant promptly.

10. Issuance of Certificates. Certificates representing shares of Common Stock purchased under the Plan may be issued only in the name of the employee, in the name of the employee and another person of legal age as joint tenants with rights of survivorship, or in the name of a broker authorized by the employee to be his, her or their, nominee for such purpose.

11. Definitions.

The term "Compensation" means the amount of base pay, prior to salary reduction pursuant to Sections 125, 132(f) or 401(k) of the Code, but excluding overtime, commissions, incentive or bonus awards, allowances and reimbursements for expenses such as relocation allowances or travel expenses, income or gains on the exercise of Company stock options, and similar items.

The term "Designated Subsidiary" means any present or future Subsidiary (as defined below) that has been designated by the Board to participate in the Plan. The Board may so designate any Subsidiary, or revoke any such designation, at any time and from time to time, either before or after the Plan is approved by the stockholders and may further designate such Subsidiaries as participating in the 423 Component or the Non-423 Component. The current list of Designated Subsidiaries is attached hereto as Appendix A.

The term "Fair Market Value of the Common Stock" on any given date means the fair market value of the Common Stock determined in good faith by the Administrator; provided, however, that if the Common Stock is admitted to quotation on the National Association of Securities Dealers Automated Quotation System ("NASDAQ"), NASDAQ Global Select Market or The NASDAQ Capital Market of The NASDAQ Stock Market LLC or another national securities exchange, the determination shall be made by reference to the closing price on such date. If there is no closing price for such date, the determination shall be made by reference to the last date preceding such date for which there is a closing price.

The term "Parent" means a "parent corporation" with respect to the Company, as defined in Section 424(e) of the Code.

The term "Participant" means an individual who is eligible as determined in Section 3 and who has complied with the provisions of Section 4.

The term "Subsidiary" means a "subsidiary corporation" with respect to the Company, as defined in Section 424(f) of the Code.

The term "Corporate Transaction" means any of the following transactions, provided, however, that the Administrator shall determine under parts (iv) and (v) whether multiple transactions are related, and its determination shall be final, binding and conclusive:

- (i) a merger or consolidation in which the Company is not the surviving entity, except for a transaction the principal purpose of which is to change the state in which the Company is incorporated;
- (ii) the sale, transfer or other disposition of all or substantially all of the assets of the Company;
- (iii) the complete liquidation or dissolution of the Company;

(iv) any reverse merger or series of related transactions culminating in a reverse merger (including, but not limited to, a tender offer followed by a reverse merger) in which the Company is the surviving entity but (A) the shares of Common Stock outstanding immediately prior to such merger are converted or exchanged by virtue of the merger into other property, whether in the form of securities, cash or otherwise, or (B) in which securities possessing more than fifty percent (50%) of the total combined voting power of the Company's outstanding securities are transferred to a person or persons different from those who held such securities immediately prior to such merger or the initial transaction culminating in such merger; or

(v) acquisition in a single or series of related transactions by any person or related group of persons (other than the Company or by a Company-sponsored employee benefit plan) of beneficial ownership (within the meaning of Rule 13d-3 of the Exchange Act) of securities possessing more than fifty percent (50%) of the total combined voting power of the Company's outstanding securities.

12. Rights on Termination of Employment. If a Participant's employment terminates for any reason before the Exercise Date for any Offering, no payroll deduction will be taken from any pay due and owing to the Participant and the balance in the Participant's account will be paid to such Participant or, in the case of such Participant's death, to his or her designated beneficiary as if such Participant had withdrawn from the Plan under Section 7. An employee will be deemed to have terminated employment, for this purpose, if the corporation that employs him or her, having been a Designated Subsidiary, ceases to be a Subsidiary, or if the employee is transferred to any corporation other than the Company or a Designated Subsidiary. An employee will not be deemed to have terminated employment for this purpose, if the employee is on an approved leave of absence for military service or sickness or for any other purpose approved by the Company, if the employee's right to reemployment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Administrator otherwise provides in writing.

13. Special Rules. Notwithstanding anything herein to the contrary, the Administrator may adopt special rules applicable to the employees of a particular Designated Subsidiary, whenever the Administrator determines that such rules are necessary or appropriate for the implementation of the Plan in a jurisdiction where such Designated Subsidiary has employees; provided that if such rules are inconsistent with the requirements of Section 423(b) of the Code, these employees will participate in the Non-423 Component. Any special rules established pursuant to this Section 13 shall, to the extent possible, result in the employees subject to such rules having substantially the same rights as other Participants in the Plan.

14. Optionees Not Stockholders. Neither the granting of an Option to a Participant nor the deductions from his or her pay shall constitute such Participant a holder of the shares of Common Stock covered by an Option under the Plan until such shares have been purchased by and issued to him or her.

15. Rights Not Transferable. Rights under the Plan are not transferable by a Participant other than by will or the laws of descent and distribution, and are exercisable during the Participant's lifetime only by the Participant.

16. Designation of Beneficiary.

(a) A Participant may file a written designation of a beneficiary who is to receive any shares of Common Stock and/or cash, if any, from the Participant's account under the Plan in the event of such Participant's death subsequent to the end of an Offering but prior to delivery to the Participant of such shares of Common Stock or cash. In addition, a Participant may file a written designation of a beneficiary who is to receive any cash from the Participant's account under the Plan in the event of such Participant's death during an Offering. Any such designation shall be on a form provided by or otherwise acceptable to the Company.

(b) The Participant may change such designation of beneficiary at any time by written notice to the Company. In the event of the death of a Participant and in the absence of a beneficiary validly designated under the Plan who is living at the time of such Participant's death, the Company shall deliver such shares of Common Stock and/or cash to the executor or administrator of the estate of the Participant, or if no such executor or administrator has been appointed (to the knowledge of the

Company), the Company, in its sole discretion, may deliver such shares of Common Stock and/or cash to the spouse or to any one or more dependents or relatives of the Participant, or if no spouse, dependent or relative is known to the Company, then to such other person as the Company may designate.

17. Application of Funds. All funds received or held by the Company under the Plan may be combined with other corporate funds and may be used for any corporate purpose.

18. Adjustment in Case of Changes Affecting Common Stock: Corporate Transaction.

(a) In the event of a subdivision of outstanding shares of Common Stock, the payment of a dividend in Common Stock or any other change affecting the Common Stock, the number of shares approved for the Plan and the share limitation set forth in Section 8 shall be equitably or proportionately adjusted to give proper effect to such event.

(b) In the event of a Corporate Transaction, then the Participants' accumulated payroll deductions under an ongoing Offering shall be used to purchase shares of Common Stock subject to the limitations in this Plan on a date determined by the Company within ten (10) business days prior to the closing of the Corporate Transaction, which date shall constitute the Exercise Date under this Plan, and the Plan shall terminate immediately after such Exercise Date and the issuance of the shares purchased on such Exercise Date.

19. Amendment of the Plan. The Board may at any time and from time to time amend the Plan in any respect, except that without the approval within 12 months of such Board action by the stockholders, no amendment shall be made increasing the number of shares approved for the Plan or making any other change that would require stockholder approval in order for the Plan, as amended, to qualify as an "employee stock purchase plan" under Section 423(b) of the Code.

20. Insufficient Shares. If the total number of shares of Common Stock that would otherwise be purchased on any Exercise Date plus the number of shares purchased under previous Offerings under the Plan exceeds the maximum number of shares issuable under the Plan, the shares then available shall be apportioned among Participants in proportion to the amount of payroll deductions accumulated on behalf of each Participant that would otherwise be used to purchase Common Stock on such Exercise Date.

21. Termination of the Plan. Except as otherwise contemplated under Section 18(b) with respect to a Corporate Transaction, the Plan may be terminated at any time by the Board. Upon termination of the Plan, all amounts in the accounts of Participants shall be promptly refunded.

22. Governmental Regulations. The Company's obligation to sell and deliver Common Stock under the Plan is subject to obtaining all governmental approvals required in connection with the authorization, issuance, or sale of such stock.

23. Governing Law. This Plan and all Options and actions taken thereunder shall be governed by, and construed in accordance with, the laws of the State of Delaware, applied without regard to conflict of law principles.

24. Issuance of Shares. Shares may be issued upon exercise of an Option from authorized but unissued Common Stock, from shares held in the treasury of the Company, or from any other proper source.

25. Tax Withholding. Participation in the Plan is subject to any minimum required tax withholding on income of the Participant in connection with the Plan. Each Participant agrees, by entering the Plan, that the Company and its Subsidiaries shall have the right to deduct any such taxes from any payment of any kind otherwise due to the Participant, including shares issuable under the Plan.

26. Notification Upon Sale of Shares. Each Participant agrees, by entering the Plan, to give the Company prompt notice of any disposition of shares purchased under the Plan where such disposition occurs within two years after the date of grant of the Option pursuant to which such shares were purchased or within one year after the date such shares were purchased.

27. Effective Date and Approval of Shareholders. The Plan shall take effect on the later of the date it is adopted by the Board and the date it is approved by the holders of a majority of the votes cast at a meeting of stockholders at which a quorum is present or by written consent of the stockholders.

**APPENDIX A**  
**Designated Subsidiaries**

**None**



[www.assemblybio.com](http://www.assemblybio.com)

---

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

**VOTE BY INTERNET - [www.proxyvote.com](http://www.proxyvote.com)**

Use the Internet to transmit your voting instructions and for electronic delivery of information up until 11:59 PM EDT on May 29, 2018. 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 PM EDT on May 29, 2018. Have your proxy card in hand when you call and then follow the instructions.

**VOTE BY MAIL**

Mark, sign and date your proxy card and return it in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717. Your vote must be received by 11:59 PM EDT on May 29, 2018.

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

E42766-P00930

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.		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.
1. Election of Directors					
<b>The Board of Directors recommends you vote FOR all nominees.</b>					
Nominees:					
01) Anthony E. Altig	04) Myron Z. Holubiak	07) Susan Mahony, Ph.D.			
02) Mark Auerbach	05) Helen S. Kim	08) William R. Ringo, Jr.			
03) Richard D. DiMarchi, Ph.D.	06) Alan J. Lewis, Ph.D.	09) Derek A. Small			
<b>The Board of Directors recommends you vote FOR proposals 2, 4, 5, 6 and 7 and for ONE YEAR for proposal 3.</b>		For	Against	Abstain	
2. Approval, on a non-binding advisory basis, of our named executive officers' compensation.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Approval of the Assembly Biosciences, Inc. 2018 Stock Incentive Plan.
		One Year	Two Years	Three Years	Abstain
3. Vote, on a non-binding advisory basis, on the frequency of future advisory votes to approve our named executive officers' compensation.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		For	Against	Abstain	
4. Ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2018.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Approval of the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan.
5. Amendment and restatement of our Third Amended and Restated Certificate of Incorporation, as amended, to increase the authorized number of shares of common stock from 50,000,000 to 100,000,000.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>NOTE:</b> Your proxy holder will also vote in their discretion upon such other matters that may properly come before the meeting or any adjournment or postponement 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.					
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Signature [PLEASE SIGN WITHIN BOX]		Date		Signature (Joint Owners)	
				Date	

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

The Notice and Proxy Statement, Annual Report on Form 10-K and Proxy Card are available at [www.proxyvote.com](http://www.proxyvote.com).

E42767-P00930

**ASSEMBLY BIOSCIENCES, INC.  
Annual Meeting of Stockholders  
May 30, 2018 8:00 AM EDT  
This proxy is solicited by the Board of Directors**

The Stockholder(s) hereby appoint(s) Derek A. Small and Graham Cooper, 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. (the "Company") that the Stockholder(s) is/are entitled to vote at the Annual Meeting of Stockholders to be held at 8:00 AM EDT on May 30, 2018, 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**