

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549**

**SCHEDULE 14A  
(RULE 14a-101)  
INFORMATION REQUIRED IN PROXY STATEMENT**

**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 14a-6(e)(2))
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Material under §240.14a-12

**SYNTHETIC BIOLOGICS, INC.**

*(Name of Registrant as Specified in Its Charter)*

\_\_\_\_\_  
*(Name of Person(s) Filing Proxy Statement, if Other Than the Registrant)*

Payment of Filing Fee (Check the appropriate box):

- No fee required.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

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

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

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

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(4) Proposed maximum aggregate value of transaction:

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

(1) Amount Previously Paid:

\_\_\_\_\_

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

\_\_\_\_\_

(3) Filing Party:

\_\_\_\_\_

(4) Date Filed:

\_\_\_\_\_



9605 Medical Center Drive, Suite 270  
Rockville, MD 20850  
(301) 417-4364

**NOTICE OF ANNUAL MEETING OF STOCKHOLDERS**

To the Stockholders of Synthetic Biologics, Inc.:

We hereby notify you that the 2018 Annual Meeting of Stockholders of Synthetic Biologics, Inc., a Nevada corporation, will be held on September 24, 2018 at 9:30 a.m. (Eastern Time), at the offices of Gracin & Marlow, LLP, The Chrysler Building, 405 Lexington Avenue, 26<sup>th</sup> Floor, New York, New York 10174, for the following purposes:

- (1) to elect the three (3) nominees for director named herein to hold office until our next annual meeting of stockholders and until their successors are duly elected and qualified;
- (2) to ratify the appointment of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018;
- (3) to approve an amendment to our Articles of Incorporation, to increase the number of shares of common stock that we will have authority to issue from 10,000,000 (after giving effect to the 1 (one) for 35 (thirty five) proportionate reverse stock split of our number of authorized shares of common stock and outstanding shares of common stock announced on August 1, 2018 and expected to be effected on August 3, 2018 (the "Reverse Stock Split")) to 200,000,000 (the "Authorized Share Increase");
- (4) to authorize an adjournment of the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 3 (the "Adjournment");
- (5) to approve an amendment to our 2010 Stock Incentive Plan to increase the number of shares of common stock that we will have authority to grant under the plan by 500,000 shares (after giving effect to the Reverse Stock Split) and to address certain recent changes to the U.S. federal income tax laws (the "Stock Incentive Plan Amendments"); and
- (6) to transact such other business as may properly come before the meeting or any adjournments or postponements of the meeting.

The matters listed in this notice of meeting are described in detail in the accompanying Proxy Statement. Our Board of Directors has fixed the close of business on August 3, 2018 as the record date for determining those stockholders who are entitled to notice of and to vote at the meeting or any adjournment or postponement of our 2018 Annual Meeting of Stockholders. The list of the stockholders of record as of the close of business on August 3, 2018 will be made available for inspection at the meeting.

**IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS FOR THE 2018 ANNUAL MEETING OF STOCKHOLDERS TO BE HELD ON SEPTEMBER 24, 2018:**

**THE NOTICE OF ANNUAL MEETING OF STOCKHOLDERS, THE PROXY STATEMENT AND OUR ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2017 ARE AVAILABLE ELECTRONICALLY AT [WWW.SYNTHETICBIOLOGICS.COM](http://WWW.SYNTHETICBIOLOGICS.COM).**

Along with the attached Proxy Statement, we are sending to you our Annual Report on Form 10-K for the year ended December 31, 2017. Such annual report, which includes our audited financial statements, is not to be regarded as proxy solicitation material.

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**YOUR VOTE IS IMPORTANT**

Even if you plan to attend the meeting, please vote as promptly as possible by using the internet or kindly sign, date, and return the enclosed proxy card in the envelope provided so that your vote will be counted if you later decide not to attend the meeting. No postage is required if the proxy card is mailed in the United States.

By order of the Board of Directors,  
/s/ Steven A. Shallcross  
Interim Chief Executive Officer  
Chief Financial Officer and Corporate Secretary  
Rockville, Maryland  
August , 2018

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9605 Medical Center Drive, Suite 270  
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(301) 417-4364

#### PROXY STATEMENT

This Proxy Statement is being furnished to holders of shares of common stock, \$0.001 par value per share, of Synthetic Biologics, Inc., a Nevada corporation (“we,” “us,” or the “Company”), in connection with the solicitation of proxies on behalf of our Board of Directors for use at our 2018 Annual Meeting of Stockholders to be held on September 24, 2018 at 9:30 a.m. (Eastern Time), at the offices of Gracin & Marlow, LLP, The Chrysler Building, 405 Lexington Avenue, 26<sup>th</sup> Floor, New York, New York 10174, and at any adjournment or postponement of our 2018 Annual Meeting of Stockholders. The purpose of the 2018 Annual Meeting of Stockholders and the matters to be acted on are stated in the accompanying notice of 2018 Annual Meeting of Stockholders. The Board of Directors knows of no other business that will come before the 2018 Annual Meeting of Stockholders.

The notice of our 2018 Annual Meeting of Stockholders, this Proxy Statement, and a proxy card, together with our Annual Report on Form 10-K for the year ended December 31, 2017, are being mailed to our stockholders on or about August 1, 2018. Such annual report, which includes our audited financial statements, is not to be regarded as proxy solicitation material. We will bear the cost of our solicitation of proxies. The original solicitation of proxies by mail may be supplemented by personal interview, telephone, or facsimile by our directors, officers, or employees, who will receive no additional compensation for such services. Arrangements will be made with brokerage houses and other custodians, nominees, and fiduciaries for the forwarding of solicitation material to the beneficial owners of stock held by any such persons, and we will reimburse those custodians, nominees, and fiduciaries for the reasonable out-of-pocket expenses incurred by them in doing so.

Our Board of Directors is soliciting votes **FOR** each of the three (3) nominees named herein for election to our Board of Directors; **FOR** the ratification of the appointment of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018; **FOR** the approval of an amendment to our articles of incorporation, as amended (the “Articles of Incorporation”), to increase the number of authorized shares of common stock from 10,000,000 (after giving effect to the 1 (one) for 35 (thirty five) proportionate reverse stock split of our number of authorized shares of common stock and outstanding shares of common stock announced on August 1, 2018 and expected to be effected on August 1, 2018 (the “Reverse Stock Split”) to 200,000,000 (the “Authorized Share Increase”); **FOR** authority to adjourn the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of the Authorized Share Increase (the “Adjournment”); and **FOR** the amendment to our 2010 Stock Incentive Plan to increase the number of shares of common stock that we will have authority to grant by 500,000 shares (after giving effect to the Reverse Stock Split) and to address certain recent changes to the U.S. federal income tax laws (the “Stock Incentive Plan Amendments”).

## INFORMATION ABOUT VOTING

**Q: *Why am I receiving these materials?***

A: The Board of Directors is providing these proxy materials to you in connection with our 2018 Annual Meeting of Stockholders, which is scheduled to take place on September 24, 2018. As a stockholder of record as of August 3, 2018, you are invited to attend the 2018 Annual Meeting of Stockholders and to vote on the items of business described in this Proxy Statement.

**Q: *What information is contained in these materials?***

A: The information included in this Proxy Statement relates to the proposals to be voted on at the 2018 Annual Meeting of Stockholders, the voting process, the compensation of our directors and executive officers, and other required information.

**Q: *What items of business will be voted on at the 2018 Annual Meeting of Stockholders?***

A: The five (5) items of business scheduled to be voted on at the 2018 Annual Meeting of Stockholders are: (1) the election of our directors named herein; (2) the ratification of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018; (3) the approval of an amendment to our Articles of Incorporation, to increase the authorized number of shares of common stock from 10,000,000 (after giving effect to the Reverse Stock Split) to 200,000,000; (4) the adjournment of the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of the Authorized Share Increase; and (5) the amendment to our 2010 Stock Incentive Plan to increase the number of shares of common stock that we will have authority to grant by 500,000 shares (after giving effect to the Reverse Stock Split) and to address certain recent changes to the U.S. federal income tax laws.

**Q: *How does the Board of Directors recommend that I vote?***

A: The Board of Directors recommends that you vote your shares: (1) **FOR** each of the nominees named herein for election to our Board of Directors; (2) **FOR** the ratification of the appointment of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018; (3) **FOR** approval of an amendment to our Articles of Incorporation, to increase the number of shares of common stock from 10,000,000 (after giving effect to the Reverse Stock Split) to 200,000,000; (4) **FOR** authority to adjourn the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of the Authorized Share Increase; and (5) **FOR** the Stock Incentive Plan Amendments.

**Q: *What shares can I vote?***

A: You may vote or cause to be voted all shares owned by you as of the close of business on August 3, 2018, the record date. These shares include: (1) shares held directly in your name as a stockholder of record; and (2) shares held for you, as the beneficial owner, through a broker or other nominee, such as a bank.

**Q: *What is the difference between holding shares as a stockholder of record and as a beneficial owner?***

A: Most of our stockholders hold their shares through a broker or other nominee rather than directly in their own name. As summarized below, there are some distinctions between shares held of record and those owned beneficially. If your shares are registered directly in your name with our transfer agent, Corporate Stock Transfer, Inc., you are considered, with respect to those shares, the stockholder of record and these proxy materials are being sent directly to you by us. As the stockholder of record, you have the right to grant your voting proxy directly to Mr. Steven Shallcross, our Interim Chief Executive Officer and Chief Financial Officer, or to vote in person at the meeting. The Board of Directors has enclosed a proxy card for stockholders of record to use to grant a voting proxy.

If your shares are held in a brokerage account or by another nominee, you are considered the beneficial owner of shares held in "street name," and these proxy materials are being forwarded to you by your broker or nominee together with a voting instruction card. As the beneficial owner, you have the right to direct your broker or nominee how to vote and are also invited to attend the 2018 Annual Meeting of Stockholders. Since you are not the stockholder of record, however, you may not vote these shares

in person at the meeting unless you obtain from the broker or nominee that holds your shares a valid proxy from them giving you the right to vote the shares. Your broker or nominee should have enclosed or provided voting instructions for you to use in directing the broker or nominee how to vote your shares. If you hold your shares through a broker and you do not give instructions to the record holder on how to vote, the record holder will be entitled to vote your shares in its discretion on certain matters considered routine, such as the ratification of the appointment of our independent registered public accounting firm, the Authorized Share Increase and the Adjournment. Neither the uncontested election of directors nor the Stock Incentive Plan Amendments are considered a routine matter. Therefore, brokers do not have the discretion to vote on the election of directors or the Stock Incentive Plan Amendments. If you hold your shares in street name and you do not instruct your broker how to vote in the election of directors and/or the Stock Incentive Plan Amendments, no votes will be cast on your behalf for the non-routine matter for which you have not provided voting instructions. These “broker non-votes” will be treated as shares that are present and entitled to vote for purposes of determining the presence of a quorum, but not as shares entitled to vote on a particular proposal.

**Q: *May I attend the 2018 Annual Meeting of Stockholders?***

A: You are entitled to attend the 2018 Annual Meeting of Stockholders only if you were a stockholder as of the close of business on the record date, August 3, 2018, or you hold a valid proxy for the 2018 Annual Meeting of Stockholders. You should be prepared to present photo identification for admittance. If you are not a record holder but hold shares beneficially through a broker or nominee (that is, in “street name”), you should provide proof of beneficial ownership on the record date, such as your most recent account statement, a copy of the voting instruction card provided by your broker or nominee, or other similar evidence of ownership. If you do not provide photo identification or comply with the other procedures outlined above upon request, you may not be admitted to the 2018 Annual Meeting of Stockholders. The 2018 Annual Meeting of Stockholders will begin promptly at 9:30 a.m. (Eastern Time). Check-in will begin at 9:00 a.m., and you should allow ample time for the check-in procedures.

**Q: *How can I vote my shares in person at the 2018 Annual Meeting of Stockholders?***

A: You may vote by ballot in person at the 2018 Annual Meeting of Stockholders any shares that you hold as the stockholder of record. You may only vote in person shares held in street name if you obtain from the broker or nominee that holds your shares a valid proxy giving you the right to vote the shares.

**Q: *How can I vote my shares without attending the 2018 Annual Meeting of Stockholders?***

A: Whether you hold shares directly as the stockholder of record or beneficially in street name, you may, without attending the meeting, direct how your shares are to be voted.

*Stockholder of Record — Shares Registered in Your Name:* If you are a stockholder of record, in addition to voting in person at the 2018 Annual Meeting of Stockholders, you may vote by proxy through the internet, or vote by proxy using a proxy card. Whether or not you plan to attend the 2018 Annual Meeting of Stockholders, 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.

- **Vote by Internet**, by going to the web address <https://secure.corporatestock.com/vote.php> and following the instructions for internet voting shown on your proxy card. Your Internet vote must be received by 11:59 p.m., Eastern Time, on September 23, 2018 to be counted.
- **Vote by Proxy Card**, by completing, signing, dating and mailing the enclosed proxy card in the envelope provided. If you return your signed proxy card to us before the 2018 Annual Meeting of Stockholders, we will vote your shares as you direct. If you vote by internet, please do not mail your proxy card.

*Beneficial Owner — Shares Registered in the Name of a Broker or Bank:* If you are a beneficial owner of shares registered in the name of your broker, bank, or other agent, you should have received an instruction card containing voting instructions from that organization rather than from us. You will be provided with instructions to vote by internet or to vote by mailing in your instruction card. Simply follow the voting instructions in the voting instruction card to ensure that your vote is counted.

**We provide internet proxy voting to allow you to vote your shares online, with procedures designed to ensure authenticity and correctness of your proxy vote instructions. Please be aware, however, that you must bear any costs associated with your internet access, such as usage charges from internet access providers and telephone companies.**

**Q: *Can I change my vote?***

A: You may change your vote at any time prior to the final vote at the 2018 Annual Meeting of Stockholders. For shares held directly in your name, you may accomplish this by: (1) sending a written notice of revocation to our Corporate Secretary at Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850; (2) granting a new proxy bearing a later date (which automatically revokes the earlier proxy); (3) granting a subsequent proxy through the internet; or (4) by attending the 2018 Annual Meeting of Stockholders and voting in person. Attendance at the meeting will not cause your previously granted proxy to be revoked unless you specifically so request. ***Even if you plan to attend the 2018 Annual Meeting of Stockholders, we recommend that you also submit your proxy or voting instructions or vote through the internet so that your vote will be counted if you later decide not to attend the 2018 Annual Meeting of Stockholders.***

For shares you hold beneficially, you may change your vote by submitting new voting instructions to your broker or nominee or, if you have obtained a valid proxy from your broker or nominee giving you the right to vote your shares, by attending the meeting and voting in person.

**Q: *Can I revoke my proxy?***

A: You may revoke your proxy before it is voted at the 2018 Annual Meeting of Stockholders. To revoke your proxy, notify our Corporate Secretary in writing at Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850, or deliver to our Corporate Secretary a duly executed proxy bearing a later date. You may also revoke your proxy by appearing at the 2018 Annual Meeting of Stockholders in person and voting your shares. If you vote by internet, you may also revoke your proxy by granting a subsequent proxy by internet. Attendance at the 2018 Annual Meeting of Stockholders will not, by itself, revoke a proxy. If your shares are held by your broker or bank as nominee or agent, you should follow the instructions provided by your broker or bank.

**Q: *Who can help answer my questions?***

A: If you have any questions about the 2018 Annual Meeting of Stockholders or how to vote or revoke your proxy, or you need additional copies of this Proxy Statement or voting materials, you should contact our Corporate Secretary at Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850 or by phone at (301) 417-4364.

**Q: *How are votes counted?***

A: In the election of directors, you may vote FOR all of the three (3) nominees named herein or you may direct your vote to be WITHHELD with respect to any one or more of the three (3) nominees named herein.

With respect to other proposals, you may vote FOR, AGAINST, or ABSTAIN.

If you provide specific instructions, your shares will be voted as you instruct. If you sign your proxy card or voting instruction card with no further instructions, your shares will be voted in accordance with the recommendations of the Board of Directors, namely (1) **FOR** each of the three (3) nominees named herein for election to our Board of Directors; (2) **FOR** the ratification of the appointment of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018; (3) **FOR** approval of an amendment to our Articles of Incorporation, to increase the number of shares of common stock from 10,000,000 (after giving effect to the Reverse Stock Split) to 200,000,000; (4) **FOR** authority to adjourn the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of the Authorized Share Increase; and (5) **FOR** the Stock Incentive Plan Amendments.



**Q: *What is a quorum and why is it necessary?***

A: Conducting business at the 2018 Annual Meeting of Stockholders requires a quorum. The presence, either in person or by proxy, of the holders of a majority of our shares of common stock outstanding on August 3, 2018 is necessary to constitute a quorum. On the record date, there were 132,969,743 (pre-Reverse Stock Split) shares outstanding and entitled to vote. 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) or if you vote in person at the 2018 Annual Meeting of Stockholders. Abstentions and broker non-votes (which result when your shares are held in “street name” and you do not tell the nominee how to vote your shares and are described in detail below) are treated as present for purposes of determining whether a quorum exists. Broker non-votes are relevant in determining whether a quorum is present at the meeting. 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.

**Q: *What are Broker-Non-Votes?***

A: Under the rules of the New York Stock Exchange, member brokers who hold shares in street name for their customers that are the beneficial owners of those shares have the authority to only vote on certain “routine” items in the event that they have not received instructions from beneficial owners. Under New York Stock Exchange rules, when a proposal is not a “routine” matter and a member broker has not received voting instructions from the beneficial owner of the shares with respect to that proposal, the brokerage firm may not vote the shares on that proposal since it does not have discretionary authority to vote those shares on that matter. A “broker non-vote” is submitted when a broker returns a proxy card and indicates that, with respect to particular matters, it is not voting a specified number of shares on that matter, as it has not received voting instructions with respect to those shares from the beneficial owner and does not have discretionary authority to vote those shares on such matters. “Broker non-votes” are not entitled to vote at the 2018 Annual Meeting of Stockholders with respect to the matters to which they apply; however, “broker non-votes” will be included for purposes of determining whether a quorum is present at the 2018 Annual Meeting of Stockholders.

Proposals 1 and 5 are considered “non-routine” matters. As a result, brokers that do not receive instructions with respect to Proposals 1 and/or 5 from their customers will not be entitled to vote on such proposal for which instructions were not received.

Proposals 2, 3 and 4 are each considered a “routine” matter. As a result, brokers that do not receive instructions with respect to Proposals 2, 3 and/or 4 from their customers will be entitled to vote on such proposal.

**Q: *What is the voting requirement to approve each of the proposals?***

- A:
- For Proposal 1, which relates to the election of directors, the three (3) nominees receiving the highest number of “FOR” votes (from the holders of votes of shares present in person or represented by proxy at the 2018 Annual Meeting of Stockholders and entitled to vote on the election of directors) will be elected. Only votes FOR or WITHHELD will affect the outcome. Abstentions and broker non-votes will have no effect on the outcome of the vote as long as each nominee receives at least one FOR vote. You do not have the right to cumulate your votes.
  - To be approved, Proposal 2, which relates to the ratification of the appointment of BDO USA, LLP, as our independent registered public accounting firm for the year ending December 31, 2018, must receive FOR votes from the holders of a majority of shares present in person or represented by proxy and entitled to vote at the 2018 Annual Meeting of Stockholders. Abstentions will have the same effect as an AGAINST vote. Although none are expected to exist in connection with Proposal 2, broker non-votes, if any, will have no effect. This vote is advisory, and therefore is not binding on us, the Audit Committee or our Board of Directors. If our stockholders fail to ratify the appointment, the Audit Committee will reconsider whether or not to retain that firm. Even if the appointment is ratified, the Audit Committee in its discretion may direct the appointment of different independent auditors at any time during the year if they determine that such a change would be in the best interests of our company and its stockholders.

- To be approved, Proposal 3 (the Authorized Share Increase) which relates to the approval of an increase in the number of authorized shares of common stock that may be issued under our Articles of Incorporation, must receive FOR votes from the holders of a majority of the issued and outstanding shares of common stock as of the record date. Abstentions and broker non-votes will have the same effect as an AGAINST vote (although no broker non-votes are expected to exist in connection with Proposal 3).
- To be approved, Proposal 4 (the Adjournment), which relates to the approval of an adjournment of the 2018 Annual Meeting must receive FOR votes from the holders of a majority of the votes present in person or represented by proxy and entitled to vote at the 2018 Annual Meeting of Stockholders. Accordingly, abstentions with respect to this proposal will have the same effect as voting AGAINST. Broker non-votes will have no effect on this proposal (although no broker non-votes are expected to exist in connection with Proposal 4).
- To be approved, Proposal 5, which relates to the Stock Incentive Plan Amendments, must receive FOR votes from the holders of a majority of the votes present in person or represented by proxy and entitled to vote at the 2018 Annual Meeting of Stockholders. Abstentions will have the same effect as an AGAINST vote. Broker non-votes will have no effect.

We encourage you to vote **FOR** all five (5) of the proposals.

If your shares are held in “street name” and you do not indicate how you wish to vote, your broker is permitted to exercise its discretion to vote your shares on certain “routine” matters. The only routine matter to be submitted to our stockholders at the 2018 Annual Meeting of Stockholders are Proposals 2, 3, and 4. Proposals 1 and 5 are not routine matters. Accordingly, if you do not direct your broker how to vote for a director in Proposal 1 or how to vote for Proposal 5, your broker may not exercise discretion and may not vote your shares on that proposal.

For purposes of Proposals 1 and 5, broker non-votes are not considered to be “votes cast” at the meeting and the shares represented by broker non-votes are not “entitled to vote” at the meeting. As such, a broker non-vote will not be counted as a vote FOR or WITHHELD with respect to a director in Proposal 1 or a vote FOR or AGAINST Proposal 5 and, therefore, will have no effect on the outcome of the vote on any such proposal. Abstentions will be counted in determining the total number of “votes cast” and the total number of shares present in person or represented by proxy and entitled to vote on each of the proposals and will therefore have the effect of a vote AGAINST on each proposal, except for Proposal 1, where the abstention will have no effect on the outcome of the vote.

**Q: *What should I do if I receive more than one set of voting materials?***

A: You may receive more than one set of voting materials, including multiple copies of this Proxy Statement and multiple proxy cards or voting instruction cards. For example, if you hold your shares in more than one brokerage account, you will receive a separate voting instruction card for each brokerage account in which you hold shares. If you are a stockholder of record and your shares are registered in more than one name, you will receive more than one proxy card. Please complete, sign, date, and return each proxy card and voting instruction card that you receive.

**Q: *Where can I find the voting results of the 2018 Annual Meeting of Stockholders?***

A: We intend to announce preliminary voting results at the 2018 Annual Meeting of Stockholders and publish final results in a Current Report on Form 8-K that will be filed with the U.S. Securities and Exchange Commission (the “SEC”) within four (4) business days after the meeting. If final voting results are not available to us in time to file a Current Report on Form 8-K within four (4) business days after the meeting, we intend to file a Current Report on Form 8-K to publish preliminary results and, within four (4) business days after the final results are known to us, file an additional Current Report on Form 8-K to publish the final results.

**Q: *What happens if additional matters are presented at the 2018 Annual Meeting of Stockholders?***

A: Other than the five (5) items of business described in this Proxy Statement, we are not aware of any other business to be acted upon at the 2018 Annual Meeting of Stockholders. If you grant a proxy, the

persons named as proxy holder, Mr. Steven Shallcross, our Interim Chief Executive Officer and Chief Financial Officer, will have the discretion to vote your shares on any additional matters properly presented for a vote at the meeting. If for any unforeseen reason any of our nominees are not available as a candidate for director, the persons named as proxy holders will vote your proxy for any one or more other candidates nominated by the Board of Directors.

**Q: *How many shares are outstanding and how many votes is each share entitled?***

A: Each share of our common stock that is issued and outstanding as of the close of business on August 3, 2018, the record date, is entitled to be voted on all items being voted on at the 2018 Annual Meeting of Stockholders, with each share being entitled to one vote on each matter. On the record date, 132,969,743 shares of common stock were issued and outstanding (pre-Reverse Stock Split).

**Q: *Who will count the votes?***

A: One or more inspectors of election will tabulate the votes.

**Q: *Is my vote confidential?***

A: Proxy instructions, ballots, and voting tabulations that identify individual stockholders are handled in a manner that protects your voting privacy. Your vote will not be disclosed, either within our business or to anyone else, except: (1) as necessary to meet applicable legal requirements; (2) to allow for the tabulation of votes and certification of the vote; or (3) to facilitate a successful proxy solicitation.

**Q: *Who will bear the cost of soliciting votes for the 2018 Annual Meeting of Stockholders?***

A: The Board of Directors is making this solicitation on our behalf, and we will pay the entire cost of preparing, assembling, printing, mailing, and distributing these proxy materials. Certain of our directors, officers, and employees, without any additional compensation, may also solicit your vote in person, by telephone, or by electronic communication. On request, we will reimburse brokerage houses and other custodians, nominees, and fiduciaries for their reasonable out-of-pocket expenses for forwarding proxy and solicitation materials to stockholders. In addition to the use of the mails, proxies may be solicited by personal interview, telephone, telegram, facsimile and advertisement in periodicals and postings, in each case by our directors, officers and employees without additional compensation. In addition, we have retained D.F. King & Co., Inc. to aid in the solicitation of proxies for this year. We will pay D.F. King & Co., Inc. fees of not more than \$7,500 plus expense reimbursement for its services. We may request by telephone, facsimile, mail, electronic mail or other means of communication the return of the proxy cards. Please contact D.F. King & Co., Inc. at (866) 796-7186 with any questions you may have regarding our proposals.

**Q: *When are stockholder proposals and director nominations due for next year's Annual Meeting of Stockholders?***

A: To be considered for inclusion in next year's proxy materials, your proposal must be submitted in writing by April [ ], 2019, to the attention of our Corporate Secretary at Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850, and you must comply with all applicable requirements of Rule 14a-8 promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act"); provided, however, that if our 2019 Annual Meeting of Stockholders is not held between August 23, 2019 and October 23, 2019, to be timely, 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.

If you wish to submit a proposal or nominate a director at the 2019 Annual Meeting of Stockholders that is not to be included in next year's proxy materials, you must currently do so in accordance with the charter of the Nominations Committee, which is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section and which contains additional requirements about advance notice required of stockholder proposals and director nominations. In addition, you must comply with all applicable requirements of Rule 14a-8 promulgated under the Exchange Act.

**PROPOSAL 1****ELECTION OF DIRECTORS**

The Board of Directors, based on the recommendation of the Nominations Committee of the Board of Directors, has nominated for annual election as director each of the individuals identified below, all of whom are incumbent directors.

**THE NOMINEES**

<b>Name</b>	<b>Age</b>	<b>Position</b>	<b>Director Since</b>
Jeffrey J. Kraws <sup>(1)(2)(3)</sup>	54	Chairman	2006
Scott L. Tarriff <sup>(1)(2)(3)</sup>	59	Director	2012
Jeffrey Wolf, JD <sup>(1)(2)(3)</sup>	55	Director	2006

- 
- (1) Member of the Audit Committee.  
 (2) Member of the Compensation Committee.  
 (3) Member of the Nominations Committee.

**OUR BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE  
 YOUR SHARES FOR THE ELECTION OF EACH OF THESE NOMINEES.**

It is the intention of the persons named in the accompanying proxy card to vote all shares of common stock for which they have been granted a proxy for the election of each of the nominees, each to serve as a director until the next annual meeting of stockholders and until his successor shall have been duly elected and qualified. All of the nominees have consented to being named in this Proxy Statement and to serve as a director if elected. At the time of the 2018 Annual Meeting of Stockholders, if any of the nominees named above is not available to serve as director (an event that the Board of Directors does not currently have any reason to anticipate), all proxies will be voted for any one or more other persons that the Board of Directors designates. The Board of Directors believes that it is in the best interests of the Company to elect the above-described nominees.

**DIRECTOR INDEPENDENCE**

No director or executive officer of the Company is related by blood, marriage or adoption to any other director or executive officer. A majority of our members of our Board of Directors are independent in compliance with the applicable listing standards of the NYSE American, LLC (“NYSE American”). The Board of Directors has affirmatively determined that the independent directors and nominees are Jeffrey J. Kraws, Scott L. Tarriff and Jeffrey Wolf.

## INFORMATION ABOUT THE NOMINEES

Stated below is the principal occupation of each nominee, the business experience of each nominee for at least the past five years, and certain other information relating to the nominees.

**Jeffrey J. Kraws.** Mr. Kraws has been a member of the Company's Board of Directors since January of 2006, and was appointed independent, non-executive Chairman of the Board in May 2012. Since 2003, Mr. Kraws has served as Chief Executive Officer and co-founder of Crystal Research Associates and CRA Advisors, and since February 2012, he has served as partner and co-founder of TopHat Capital, LLC. Since August 2016, Mr. Kraws has served as the President of Ra Medical Systems Inc., a private medical device company. Mr. Kraws is a Registered Representative at Terranova Capital Partners, Inc. since October 2014, a partner at Grannus Securities Pty Ltd. (an Australian based private equity fund) since November 2015 and a partner at Phoenix Holdings since November 2015. Well known and respected on Wall Street, Mr. Kraws has received some of the most prestigious awards in the industry. Among other awards, he was given a "5-Star Rating" in 2001 by Zacks and was ranked the number one analyst among all pharmaceutical analysts for stock performance in 2001 by Starmine.com. Prior to founding Crystal Research Associates, Mr. Kraws served as co-president of The Investor Relations Group (IRG), a firm representing primarily under-followed, small-capitalization companies. Previously, Mr. Kraws served as a managing director of healthcare research for Ryan Beck & Co. and as director of research/senior pharmaceutical analyst and managing director at Gruntal & Co., LLC (prior to its merger with Ryan Beck & Company). Mr. Kraws served as managing director of the healthcare research group and senior pharmaceutical analyst at First Union Securities (formerly EVEREN Securities); as senior U.S. pharmaceutical analyst for the Swedish-Swiss conglomerate Asea Brown Boveri; and as managing director and president of the Brokerage/Investment Banking operation of ABB Aros Securities, Inc. He also served as senior pharmaceutical analyst at Nationsbank Montgomery Securities, BT Alex Brown & Sons, and Buckingham Research. Mr. Kraws also has industry experience, having been responsible for competitive analysis within the treasury group at Bristol-Myers-Squibb Company. During 2006 through February of 2007, Mr. Kraws served as our Vice President of Business Development, on a part-time basis. Since December 2013, Mr. Kraws serves on the board of directors of Saleen Automotive, Inc. (OTC: SLNN). He holds an M.B.A. from Cornell University and a B.S. degree from State University of New York — Buffalo. Mr. Kraws brings a strong business background to Synthetic Biologics, having worked as a pharmaceutical analyst for over 22 years.

Mr. Kraws brings to the Board significant strategic, business and financial experience related to the business and financial issues facing pharmaceutical companies. Mr. Kraws has a broad understanding of the operational, financial and strategic issues facing pharmaceutical companies. Through his services as the Company's Vice President of Business Development during 2006 and a part of 2007, he developed extensive knowledge of Synthetic Biologics' business.

**Scott L. Tarriff.** Mr. Tarriff has been a member of the Company's Board of Directors since February 3, 2012. Since January 2007 he has served as a director and Chief Executive Officer of Eagle Pharmaceuticals, Inc., a publicly traded, hospital specialty company. Eagle Pharmaceuticals, Inc. (NASDAQ: EGRX) is focused on developing branded parenteral products through the application of various in-licensed drug delivery technologies. Prior to joining Eagle, Mr. Tarriff held various executive positions at Par Pharmaceutical Companies, Inc., a publicly-traded developer, manufacturer and marketer of specialty pharmaceuticals, including as president and chief executive officer from September 2003 to September 2006, after joining Par in 1998. Mr. Tarriff also served on Par's board of directors from 2002 to September 2006. Prior to that, Mr. Tarriff held various positions with Bristol-Meyers Squibb, a publicly-traded biopharmaceutical company, including senior director marketing. Mr. Tarriff currently serves on the board of directors of ZIOPHARM Oncology, Inc., a publicly traded biopharmaceutical company and previously served on the board of directors of Clinical Data, Inc., a publicly-traded pharmaceutical company, from September 2009 to April 2011 when Clinical Data was acquired by Forest Laboratories, Inc. Mr. Tarriff holds a B.S. in marketing from Pennsylvania State University and an M.B.A. from Rider College.

Mr. Tarriff brings to our Board of Directors significant knowledge of and experience in the pharmaceutical and medical industries. He has extensive business, managerial, executive and leadership experience that further qualify him to serve as a member of the Board and a valuable understanding of the

role played by the Board of Directors acquired through service on the boards of many companies. He has had a long and successful career in top executive leadership positions with leading, publicly traded pharmaceutical companies including Eagle Pharmaceuticals, Inc., Par Pharmaceuticals Companies, Inc. and Bristol-Myers Squibb.

**Jeffrey Wolf, J.D.** Mr. Wolf, who has been a member of the Company's Board of Directors since 2006, has substantial experience in creating, financing, nurturing and growing new ventures based upon breakthrough research and technology. In August 2008, Mr. Wolf founded Heat Biologics, Inc. (NASDAQ: HTBX), a publicly traded company engaged in research and development of drugs focused on combating cancer and other diseases. Since April 2010, Mr. Wolf has served as the Chief Executive Officer and Chairman of the Board of Heat Biologics, Inc. Prior to founding Heat Biologics, Inc., from June 1997 to March 2011, Mr. Wolf has served as managing director at Seed-One Ventures, LLC a venture firm focused on launching and growing exceptional healthcare companies from the ground up. Since founding Seed-One, Mr. Wolf has founded and run several medical companies. Mr. Wolf's start-ups include Avigen, a San Francisco-based gene therapy company where he was a co-founder and director; TyRx Pharma, a Princeton-based company focused on the development of bio-compatible polymers where he was a co-founder and Chairman; EluSys Therapeutics, a New Jersey company focused on the development of novel technology to remove blood-borne pathogens where he was a cofounder, Chairman and Chief Executive Officer; and GenerationOne, a Miami-based company focused on mobile-based collaborative care, where he was the founder, Chairman and Chief Executive Officer. Mr. Wolf received his M.B.A. from Stanford Business School, his J.D. from New York University School of Law and his B.A. from the University of Chicago, where he graduated with honors in Economics. Mr. Wolf serves as a director of several Seed-One portfolio companies.

Mr. Wolf has extensive knowledge of the industry and in particular research and development. His legal and business background provide him with a broad understanding of the legal, operational, financial and strategic issues facing Synthetic Biologics. Having served as a board member on other public company boards, Mr. Wolf has an extensive understanding of the operational, financial and strategic issues facing public companies.

## INFORMATION REGARDING THE COMMITTEES OF THE BOARD OF DIRECTORS

We formed an Audit Committee, Compensation Committee and Nominations Committee of our Board of Directors in 2007.

### *Audit Committee*

The members of the Audit Committee are Mr. Wolf (Chairman), Mr. Kraws and Mr. Tarriff. The Audit Committee met five (5) times during the year ended December 31, 2017. The primary purpose of the Audit Committee is to act on behalf of the Board of Directors in its oversight of all material aspects of our accounting and financial reporting processes, internal controls and audit functions, including our compliance with Section 404 of the Sarbanes-Oxley Act of 2002.

The duties of the Audit Committee include the hiring and retaining of our independent registered public accounting firm, which reports to the Audit Committee. The Audit Committee reviews with our independent registered public accounting firm the scope and results of the audit engagement and the system of internal controls and procedures. The Audit Committee also reviews the effectiveness of procedures intended to prevent violations of laws. The Audit Committee also reviews, prior to publication, our quarterly earnings releases and our reports to the SEC on Forms 10-K and 10-Q. The formal report of the Audit Committee for 2017 is set forth under the caption “Report of the Audit Committee of the Board of Directors” in Proposal 2.

Our Board of Directors has determined that the members of the Audit Committee are “independent” under the applicable rules of the NYSE American and that Mr. Wolf, Mr. Kraws and Mr. Tarriff are each an “audit committee financial expert” within the meaning of the regulations of the SEC.

Audit Committee members must also satisfy the independence criteria set forth in Rule 10A-3 under the Exchange Act. In order to be considered to be independent for purposes of Rule 10A-3, a member of an Audit Committee of a listed company may not, other than in his or her capacity as a member of the Audit Committee, the Board of Directors, or any other board committee: (1) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries or (2) be an affiliated person of the listed company or any of its subsidiaries. Each member of our Audit Committee is “independent” under Rule 10A-3 of the Exchange Act.

The Audit Committee has adopted a formal written charter, a copy of which is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section.

### *Compensation Committee*

The members of the Compensation Committee are Mr. Kraws (Chairman), Mr. Tarriff and Mr. Wolf. The Compensation Committee met seven (7) times during the year ended December 31, 2017. The Compensation Committee reviews and reports to the Board of Directors on all elements of compensation of our executive officers. Our Board of Directors has determined that the members of the Compensation Committee are “independent” under the applicable rules of the NYSE American.

Our Compensation Committee annually reviews the compensation program for our Chief Executive Officer and other members of senior management and then makes recommendations to the full Board of Directors for determination. In each case, the Compensation Committee takes into account the results achieved by the executive, his future potential, and his scope of responsibilities and experience. Our Chief Executive Officer makes recommendations to the Compensation Committee regarding the compensation of our other executive officers and other members of management but does not participate in any discussions or processes concerning his own compensation, and does not vote on the compensation of our Chief Financial Officer and other members of management.

During the year ended December 31, 2017, the Compensation Committee evaluated the performance of our executives and other members of senior management and considered the compensation levels and equity programs at comparable companies and related industries before it made its compensation recommendations to the full Board, including recommendations regarding salary increases, awards of cash bonuses and awards of stock options.

The Compensation Committee administers our stock plan, including review and recommendation of long-term incentive compensation for each executive, director and employee, including grants of stock options. The Compensation Committee believes that this long-term incentive compensation aligns the interests of our executives with those of our stockholders and furthers executive retention.

The Compensation Committee also reviews and recommends to the Board of Directors appropriate director compensation programs for service as directors, Committee chairs and Committee members.

The Compensation Committee operates under a formal charter that governs its duties and standards of performance. A copy of the charter is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section.

### ***Nominations Committee***

The members of the Nominations Committee are Mr. Tarriff (Chairman), Mr. Kraws and Mr. Wolf. Our Board of Directors has determined that the members of the Nominations Committee are “independent” under the applicable rules of the NYSE American. The Nominations Committee met two (2) times during the year ended December 31, 2017. The Nominations Committee performs the following functions:

- It considers and recommends to the Board of Directors individuals for appointment or election as directors;
- It makes recommendations to the Board of Directors regarding any changes to the size of the Board of Directors or any Committee;
- It reports to the Board of Directors on a regular basis; and
- It performs any other duties or responsibilities expressly delegated to it by the Board of Directors relating to Board or Committee members.

Candidates for director should have certain minimum qualifications, including the ability to understand basic financial statements, being over 21 years of age, having relevant business experience (taking into account the business experience of the other directors), and having high moral character. The Nominations Committee retains the right to modify these minimum qualifications from time to time.

In evaluating an incumbent director whose term of office is set to expire, the Nominations Committee reviews such director’s overall service to the Company during such director’s term, including the number of meetings attended, level of participation, quality of performance, and any transactions with the Company engaged in by such director during his term.

When selecting a new director nominee, the Nominations Committee first determines whether the nominee must be independent for NYSE American purposes or whether the candidate must qualify as an “audit committee financial expert.” The Nominations Committee then uses its network of contacts to compile a list of potential candidates, but may also engage, if it deems appropriate, a professional search firm to assist in the identification of qualified director candidates. The Nominations Committee also will consider nominees recommended by our stockholders. The Nominations Committee does not distinguish between nominees recommended by our stockholders and those recommended by other parties. The Nominations Committee evaluates the suitability of potential nominees, taking into account the current composition of the Board of Directors, including expertise, diversity and the balance of inside and independent directors. The Nominations Committee endeavors to establish a diversity of background and experience in a number of areas of core competency, including business judgment, management, accounting, finance, knowledge of our industry, strategic vision, research and development and other areas relevant to our business.

Under our current governing documents, stockholders wishing to directly recommend candidates for election to the Board of Directors at our next annual meeting to be included in our Proxy Statement must do so by giving written notice to: Chairman of the Nominations Committee, Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850. Any such notice must be delivered to the Chairman not less than 120 days prior to the anniversary of the preceding year’s annual meeting. The notice must state: (1) the name and address of the stockholder making the recommendations; (2) the name,



age, business address, and residential address of each person recommended; (3) the principal occupation or employment of each person recommended; (4) the class and number of shares of the Company's stock that are beneficially owned by each person recommended and by the recommending stockholder; (5) any other information concerning the persons recommended that must be disclosed in nominee and proxy solicitations in accordance with Regulation 14A of the Exchange Act; and (6) a signed consent of each person recommended stating that he or she consents to serve as a director of the Company if elected.

In considering any person recommended by one of our stockholders, the Nominations Committee will look for the same qualifications that it looks for in any other person that it is considering for a position on the Board of Directors. Any stockholder nominee recommended by the Committee and proposed by the Board of Directors for election at the next annual meeting of stockholders will be included in the Company's Proxy Statement for that annual meeting.

The Nominations Committee operates under a formal charter that governs its duties and standards of performance. A copy of the charter is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section.

### **Board Leadership Structure**

We currently have two separate people serving as our Chairman of the Board of Directors and as our Interim Chief Executive Officer, and we do not have a formal policy on whether the same person should (or should not) serve as both the Chief Executive Officer and Chairman of the Board of Directors. Due to the size of our company, we believe that this structure is appropriate in recognition of the time commitment and activities required to function effectively as a Chairman and as a Chief Executive Officer. Mr. Kraws has served as the Chairman of the Board of Directors since May 2012. Mr. Shallcross has served as our Interim Chief Executive Officer since December 2017. In serving as Chairman of the Board of Directors, Mr. Kraws serves as a significant resource for our Interim Chief Executive Officer, other members of management and the Board of Directors. We believe that the division of duties and additional avenues of communication between the Board of Directors and management with Mr. Kraws serving as Chairman of the Board of Directors provides a basis for the proper functioning of our Board of Directors and oversight of management.

We do not have a separate lead independent director. We believe the combination of Mr. Kraws as our Chairman of the Board and Mr. Shallcross as our Interim Chief Executive Officer and Chief Financial Officer is an effective structure for us. Our current structure is operating effectively to foster productive, timely and efficient communication among the independent directors and management. We do have active participation in our Committees by our independent directors, who comprise all of the members of all of our Committees. Each Committee performs an active role in overseeing our management and there are complete and open lines of communication with the management and independent directors.

### **Oversight of Risk Management**

The Board of Directors has an active role, as a whole and also at the Committee level, in overseeing management of our risks. The Board of Directors regularly reviews information regarding our strategy, finances and operations, as well as the risks associated with each. The Audit Committee is responsible for oversight of our risks relating to accounting matters, financial reporting and legal and regulatory compliance. The Audit Committee undertakes, at least annually, a review to evaluate these risks. Individual members of the Audit Committee are each assigned an area of risk to oversee. The members then meet separately with management responsible for such area, including our Chief Financial Officer, internal auditor and counsel, and report to the Audit Committee on any matters identified during such discussions with management. Our Compensation Committee is responsible for overseeing the management of risks relating to our executive compensation plans and arrangements. While each Committee is responsible for evaluating certain risks and overseeing the management of such risks, the entire Board of Directors is regularly informed through Committee reports about such risks.

### **STOCKHOLDER COMMUNICATIONS WITH THE BOARD OF DIRECTORS**

Stockholders may direct any communications intended for the Board of Directors to our Corporate Secretary by telephone at (301) 417-4364, by facsimile at (301) 417-4367, or by mail to Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850.

This centralized process assists the Board of Directors in reviewing and responding to stockholder communications in an appropriate manner. If a stockholder wishes to direct any communication to a specific member of the Board of Directors, the name of that member of the Board of Directors should be noted in the communication. The Board of Directors has instructed the Corporate Secretary to forward stockholder correspondence only to the intended recipients, and has also instructed the Corporate Secretary to review all stockholder correspondence and, in the Corporate Secretary's discretion, refrain from forwarding any items deemed to be of a commercial or frivolous nature or otherwise inappropriate for the Board of Directors' consideration. Any such items may be forwarded elsewhere in the Company for review and possible response.

### **BOARD AND COMMITTEE MEETINGS**

During the year ended December 31, 2017, the Board of Directors held thirteen (13) meetings. During the year ended December 31, 2017, our Audit, Compensation and Nominations Committees met five (5) times, seven (7) times and two (2) times, respectively. Each director attended at least eighty five percent (85%) of the aggregate of all meetings of the Board of Directors and all of the Committee meetings, for the Committees on which he serves.

### **DIRECTOR ATTENDANCE AT ANNUAL MEETINGS**

Our directors are encouraged, but not required, to attend our Annual Meetings of Stockholders. All three of our directors attended the 2017 Annual Meeting of Stockholders in person.

### **SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE**

Section 16(a) of the Exchange Act requires our executive officers, directors and persons who beneficially own more than ten percent (10%) of a registered class of our equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of our common stock. Such officers, directors and persons are required by SEC regulation to furnish us with copies of all Section 16(a) forms that they file with the SEC.

Based solely on a review of the copies of such forms that were received by us, or written representations from certain reporting persons that no Forms 5 were required for those persons, we are not aware of any failures to file reports or report transactions in a timely manner during the year ended December 31, 2017.

### **CORPORATE GOVERNANCE**

We operate according to a comprehensive plan of corporate governance for the purpose of defining responsibilities, setting high standards of professional and personal conduct, and assuring compliance with those responsibilities and standards. We regularly monitor developments in the area of corporate governance and will continue to monitor developments and make adjustments from time to time to ensure compliance in this area. Information regarding our corporate governance that is not provided below is described elsewhere in this Proxy Statement.

#### *Code of Conduct*

We adopted a Code of Conduct that applies to all of our directors, officers and employees. The Code of Conduct is intended to promote honest and ethical conduct, full, accurate and timely disclosure, and compliance with all applicable laws and government regulations. A copy of the Code of Conduct is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section. If we make any substantive amendments to the Code of Conduct or grant any waiver from a provision of the Code of Conduct to any director or officer, we will promptly disclose the nature of the amendment or waiver on our website.

*Code of Ethics for Financial Management*

We adopted a Code of Ethics for Financial Management that applies to all persons responsible for our financial management. The Code of Ethics for Financial Management is intended to promote professional conduct in our financial management. A copy of our Code of Ethics for Financial Management is available on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) in the Investors section. Violations of the Code of Ethics for Financial Management may be reported anonymously to our Audit Committee and may result in disciplinary action. If we make any substantive amendments to the Code of Ethics for Financial Management or grant any waiver from a provision of the Code of Ethics for Financial Management to any director or officer, we will promptly disclose the nature of the amendment or waiver on our website.

**DIRECTOR COMPENSATION**

The following table sets forth information for the fiscal year ended December 31, 2017 regarding the compensation of our directors who at December 31, 2017 were not also our Named Executive Officers.

Name	Fees Earned or Paid in Cash	Option Awards <sup>(1)(3)</sup>	Other Compensation	Total
Jeffrey J. Kraws <sup>(2)</sup>	\$ 176,000	\$ 65,000	\$ —	\$241,000
Scott Tarriff	\$ 48,000	\$ 65,000	\$ —	\$113,000
Jeffrey Wolf	\$ 54,000	\$ 65,000	\$ —	\$119,000

- (1) The amounts in the “Option Awards” column reflect the dollar amounts of the grant date fair value for the financial statement reporting purposes for stock options for the fiscal year ended December 31, 2017 in accordance with ASC 718. The fair value of the options was determined using the Black-Scholes model. For a discussion of the assumptions used in computing this valuation, see “Management’s Discussion and Analysis of Financial Conditions and Results of Operations” and Note 5 of the Notes to Consolidated Financial Statements in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017.
- (2) Mr. Kraws was appointed as our independent, non-executive Chairman of the Board of Directors in May 2012. Pursuant to his agreement Mr. Kraws receives an annual retainer of \$150,000 for serving as our Chairman.
- (3) As of December 31, 2017, as adjusted for the Reverse Stock Split, the following are the outstanding aggregate number of option awards held by each of our directors who were not also Named Executive Officers:

Name	Option Awards (#)
Jeffrey J. Kraws	22,107
Scott Tarriff	19,250
Jeffrey Wolf	19,964

### **LIMITS ON LIABILITY AND INDEMNIFICATION**

Our Articles of Incorporation and Amended and Restated By-Laws provide that we will indemnify and hold harmless each person who serves at any time as a director or officer from and against any and all claims, judgments and liabilities to which such person shall become subject by reason of the fact that he or she is or was a director or officer of the Company, and shall reimburse such person for all legal and other expenses reasonably incurred by him or her in connection with any such claim or liability. We believe that this indemnification covers at least negligence and gross negligence on the part of the indemnified parties. Insofar as indemnification for liabilities under the Securities Act of 1933, as amended (the "Securities Act") may be permitted to directors, officers, and controlling persons of the Company under the foregoing provisions or otherwise, we have been advised that in the opinion of the SEC that indemnification is against public policy as expressed in the Securities Act, and is therefore unenforceable. We entered into an indemnification agreement with our directors and officers. The agreement confirms our obligation to indemnify the directors and officers to the fullest extent authorized by our Articles of Incorporation and Amended and Restated By-Laws and supplements the indemnification otherwise available to the covered person under our Articles of Incorporation and Amended and Restated By-Laws. The form of indemnification agreement was described and filed as an exhibit to the Form 8-K we filed with the SEC on January 6, 2009.

### **COMPENSATION COMMITTEE INTERLOCKS**

During the last fiscal year ended December 31, 2017, none of our executive officers served on the Board of Directors or Compensation Committee of any other entity whose officers served either on our Board of Directors or Compensation Committee.

**PROPOSAL 2**  
**RATIFICATION OF APPOINTMENT OF**  
**INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

The Audit Committee of the Board of Directors has appointed BDO USA, LLP as our independent registered public accounting firm for the year ended December 31, 2018.

Ratification of the appointment of BDO USA, LLP by our stockholders is not required by law, our bylaws or other governing documents. As a matter of policy, however, the appointment is being submitted to our stockholders for ratification at the 2018 Annual Meeting of Stockholders. If our stockholders fail to ratify the appointment, the Audit Committee will reconsider whether or not to retain that firm. Even if the appointment is ratified, the Audit Committee in its discretion may direct the appointment of different independent auditors at any time during the year if they determine that such a change would be in the best interests of the Company and its stockholders.

At the 2018 Annual Meeting of Stockholders, the representatives of BDO USA, LLP are expected to be available in person to respond to appropriate questions and will be afforded an opportunity to make a statement if they so desire.

**REPORT OF THE AUDIT COMMITTEE OF THE BOARD OF DIRECTORS <sup>(1)</sup>**

Our Audit Committee reviews our financial reporting process on behalf of our Board of Directors. In January 2007, our Board of Directors adopted a written charter for our Audit Committee, which it re-evaluates annually. In fulfilling its responsibilities, the Audit Committee has reviewed and discussed the audited financial statements contained in the Annual Report on Form 10-K for the year ended December 31, 2017, with our management and our independent registered public accounting firm for such year, BDO USA, LLP. Our management is responsible for the financial statements and the reporting process, including the system of internal controls. The independent registered public accounting firm is responsible for expressing an opinion on the conformity of those audited financial statements with accounting principles generally accepted in the United States.

The Audit Committee (1) discussed with BDO USA, LLP the matters required to be discussed by the Public Company Accounting Oversight Board (“PCAOB”) Auditing Standard No. 1301, *Communications with Audit Committees*, as amended and adopted by the PCAOB in Rule 3200T; (2) received and reviewed the written disclosures and the letter from BDO USA, LLP required by PCAOB Ethics and Independence Rule 3526, *Communication with Audit Committees Concerning Independence*; and (3) discussed with BDO USA, LLP its independence. The Audit Committee also considered whether, and determined that, the independent registered public accounting firm’s provision of other non-audit services to us was compatible with maintaining BDO USA, LLP’s independence.

During 2017, management evaluated our system of internal control over financial reporting in accordance with the requirements set forth in Section 404 of the Sarbanes-Oxley Act of 2002 and related regulations. The Audit Committee was kept apprised of the progress of the evaluation and provided oversight and advice to management during the process. In connection with this oversight, the Audit Committee received periodic updates provided by management and the independent registered public accounting firm at each regularly scheduled Audit Committee meeting. At the conclusion of the process, management provided the Audit Committee with a report on the effectiveness of our internal control over financial reporting. The Audit Committee also reviewed the report of management contained in our 2017 Annual Report on Form 10-K, as well as the Reports of Independent Registered Public Accounting Firm (included in the 2017 Annual Report on Form 10-K). These reports related to its audit of (1) the consolidated financial statements; and (2) the effectiveness of internal control over financial reporting. The Audit Committee continues to oversee our efforts related to our internal control over financial reporting and management’s preparations for the evaluations in 2018.

It should be noted that the members of our Audit Committee are not our employees and are not performing the functions of auditors or accountants. Accordingly, it is not the duty or responsibility of the Audit Committee or its members to conduct “field work” or other types of auditing or accounting reviews or procedures or to set auditor independence standards. Members of the Audit Committee necessarily rely on the information provided to them by management and the independent auditors. Accordingly, the Audit Committee’s considerations and discussions referred to above do not constitute assurance that the audit of our financial statements has been carried out in accordance with generally accepted auditing standards or that our auditors are in fact independent.

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

Based on the review and discussions referred to above, the Audit Committee recommended to our Board of Directors (and our Board of Directors approved) that the audited financial statements be included in our Annual Report on Form 10-K for the year ended December 31, 2017, for filing with the SEC. In addition, the Audit Committee recommended to our Board of Directors and our Board of Directors approved that BDO USA, LLP be appointed as our independent registered public accounting firm for the year ended December 31, 2018 and that this appointment be presented to stockholders for ratification.

Members of the Audit Committee:

Jeffrey Wolf (Chairman)

Jeffrey J. Kraws

Scott L. Tarriff

**AUDIT FEES AND ALL OTHER FEES****Independent Registered Public Accounting Firm Fees and Services**

The following table sets forth the aggregate fees including expenses billed to us for the years ended December 31, 2017 and 2016 by BDO USA, LLP.

	December 31,	
	2017	2016
Audit Fees and Expenses <sup>(1)</sup>	\$305,000	\$334,000
	<u>\$305,000</u>	<u>\$334,000</u>

- (1) Audit fees and expenses were for professional services rendered for the audit and reviews of the consolidated financial statements of the Company, professional services rendered for issuance of consents and assistance with review of documents filed with the SEC.

**Audit Committee Pre-Approval Policy**

The Audit Committee has adopted procedures for pre-approving all audit and non-audit services provided by the independent registered public accounting firm, including the fees and terms of such services. These procedures include reviewing detailed back-up documentation for audit and permitted non-audit services. The documentation includes a description of, and a budgeted amount for, particular categories of non-audit services that are recurring in nature and therefore anticipated at the time that the budget is submitted. Audit Committee approval is required to exceed the pre-approved amount for a particular category of non-audit services and to engage the independent registered public accounting firm for any non-audit services not included in those pre-approved amounts. For both types of pre-approval, the Audit Committee considers whether such services are consistent with the rules on auditor independence promulgated by the SEC and the Public Company Accounting Oversight Board (PCAOB). The Audit Committee also considers whether the independent registered public accounting firm is best positioned to provide the most effective and efficient service, based on such reasons as the auditor's familiarity with our business, people, culture, accounting systems, risk profile, and whether the services enhance our ability to manage or control risks and improve audit quality. The Audit Committee may form and delegate pre-approval authority to subcommittees consisting of one or more members of the Audit Committee, and such subcommittees must report any pre-approval decisions to the Audit Committee at its next scheduled meeting. All of the services provided by the independent registered public accounting firm were pre-approved by the Audit Committee.

**OUR BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE FOR  
RATIFICATION OF THE SELECTION OF BDO AS OUR INDEPENDENT REGISTERED PUBLIC  
ACCOUNTING FIRM FOR THE YEAR ENDING DECEMBER 31, 2018.**



### PROPOSAL 3

#### APPROVAL OF AN AMENDMENT TO OUR ARTICLES OF INCORPORATION TO INCREASE THE NUMBER OF AUTHORIZED SHARES OF COMMON STOCK

Our Board of Directors has unanimously approved an amendment to our Articles of Incorporation to increase the number of shares of authorized common stock from 10,000,000 shares (after giving effect to the 1 (one) for 35 (thirty five) proportionate reverse stock split of our authorized number of shares of common stock and our outstanding number of shares of common stock announced on August 1, 2018 which is expected to be effected on or before August 1, 2018) to 200,000,000 shares, as further described below. If approved, the Authorized Share Increase would be effected by amending Article 3 of our Articles of Incorporation to reflect the Authorized Share Increase. The full text of the proposed amended Article 3 of our Articles of Incorporation is attached to this Proxy Statement as Appendix A.

On July 28, 2018, due to our low stock price, our Board of Directors approved a (1) one for 35 (thirty five) proportionate reverse stock split of our authorized number of shares of common stock and our outstanding number of shares of common stock. Pursuant to the laws of the State of Nevada, our state of incorporation, our Board of Directors has authority to effect a reverse stock split without stockholder approval if the number of authorized shares of common stock and the number of outstanding shares of common stock are proportionately reduced provided we meet certain other requirements, which were met. Prior to effecting the Reverse Stock Split, our common stock had been selling at below \$0.20 per share. If our common stock falls below \$0.20 per share on a 30-trading-day average it will become subject to the continued listing evaluation and follow-up procedures set forth in Section 1009 of the NYSE American Company Guide which could, among other things, result in initiation of delisting procedures. In the event that we were to fail to meet the requirements of NYSE American per share price requirement or stockholders equity requirement and we could not timely cure such deficiency, our common stock would be delisted. In the event the stock price falls below \$0.06, it may be subject to immediate delisting proceedings.

The Board of Directors proposes and recommends increasing the number of shares of authorized common stock from the 10,000,000 shares that will be authorized for issuance pursuant to our Articles of Incorporation (after giving effect to the Reverse Stock Split of shares of common stock and our outstanding number of shares of common stock) to a total of 200,000,000 shares of common stock. The chart below illustrates the number of shares of common stock that will be available for issuance if the Authorized Share Increase is effected. The number of shares disclosed in the column "Estimated number of shares of Common Stock after the Authorized Share Increase" gives further effect to the Authorized Share Increase in the number of authorized shares of Common Stock from 10,000,000 (after giving effect to the Reverse Stock Split) to 200,000,000.

	ESTIMATED NUMBER OF SHARES OF COMMON STOCK BEFORE INCREASE <sup>(1)</sup>	ESTIMATED NUMBER OF SHARES OF COMMON STOCK AFTER THE INCREASE
Authorized	10,000,000	200,000,000
Outstanding	3,799,136	4,432,325
Issuable upon exercise of outstanding warrants and options and conversion of preferred stock	1,908,660	2,226,770
Reserved for issuance <sup>(2)</sup>	170,674	170,674
Authorized but unissued <sup>(3)</sup>	4,121,530	193,141,786

(1) Number of shares reflected is after giving effect to the 1 (one) for 35 (thirty five) proportionate reverse stock split of our authorized number of shares of common stock and our outstanding number of shares of common stock announced on August 1, 2018 which is expected to be effected on or before August 1, 2018.

(2) Shares reserved for future issuance under our existing equity incentive plans, excluding shares issuable under outstanding stock options. Does not take into account the increase under Proposal 5.

- (3) Shares authorized but unissued represent common stock available for future issuance beyond shares currently outstanding, shares issuable under outstanding warrants and stock options or upon conversion of our outstanding preferred stock, and shares reserved for issuance under equity incentive plans.

The Board of Directors believes that the Authorized Share Increase is advisable and in our stockholders' best interests. The Authorized Share Increase will provide us with flexibility in completing financing and capital raising transactions, which may be necessary for us to execute our future business plans and remain compliant with the NYSE American listing requirements.

We anticipate that we may issue additional shares of common stock in the future in connection with one or more of the following:

- financing transactions, such as public or private offerings of common stock or convertible securities;
- partnerships, collaborations and other similar transactions;
- our equity incentive plans;
- strategic investments; and
- other corporate purposes that have not yet been identified.

The availability of additional shares of common stock for issuance is, in management's view, prudent and will afford us flexibility in acting upon financing transactions to strengthen our financial position and/or commercial partnership opportunities that may arise and aid in meeting the NYSE American stockholders' equity requirements. As of the Record Date and after the Reverse Stock Split, we have approximately 4,121,530 authorized shares of common stock available for future issuance. We do not believe that this is sufficient to meet our future equity financing requirements. Other than our "at-the-market" Issuance Sales Agreement with B. Riley FBR, Inc., we currently have no agreements with any third parties for the sale of our securities. Although at this time, we do not have any plans, commitments, proposals, arrangements, understandings or agreements regarding the issuance of common stock other than issuances upon exercise or conversion of currently outstanding securities; we anticipate seeking future equity financing opportunities and will evaluate opportunities that are presented to us. We believe that the Authorized Share Increase will help ensure that we have sufficient authorized shares available for issuance to allow us to pursue equity financing if the Board determines that it would be in our best interests based on our working capital needs and prevailing market conditions. Section 1003 of the NYSE American Company Guide provides that the NYSE American exchange will consider suspending from trading or delisting a common stock of a company if minimum shareholders' equity, stock price and number of stockholder standards are not met by that company. On March 7, 2018, we announced that we received written communication from NYSE American stating that we were no longer in compliance with certain continued listing standards as set forth in the NYSE American Company Guide. Specifically, based on our Annual Report on Form 10-K and subsequent filings with the SEC, we are below compliance with Part 10, Section 1003 (iii) of the NYSE American Company Guide since we reported stockholders' deficit of \$1.5 million and net losses in five of our most recent fiscal years as of December 31, 2017. We anticipate seeking equity financing as a remedy to regain compliance with certain NYSE American continued listing standards, unless our share price appreciates to a price which would cure our failure to meet the stockholder's equity requirement. We cannot provide assurances that any such transactions will be consummated on favorable terms or at all, that they will enhance stockholder value, or that they will not adversely affect our business or the trading price of the common stock. To the extent that we raise additional funds by issuing additional shares of common stock, our stockholders may experience significant dilution.

In addition, the Authorized Share Increase could facilitate our ability to effect a future second reverse stock split of our outstanding shares of common stock (that is, in addition to the 1 (one) for 35 (thirty five) proportionate reverse stock split effected on August 1, 2018) by increasing the number of our unissued authorized shares available to us for other purposes, which reverse stock split will not require stockholder approval under Nevada law if the number of authorized shares of common stock and the number of

outstanding shares of common stock are proportionately reduced. We believe that the additional authorized shares would enable us to act quickly in response to opportunities that may arise for these types of transactions, in most cases without the necessity of obtaining further stockholder approval and holding a special stockholders' meeting before such issuance(s) could proceed, except as provided under Nevada law or under applicable NYSE American rules.

#### **Possible Effects of the Authorized Share Increase**

The newly authorized shares of common stock will have all the powers, preferences, and rights of the shares of common stock presently authorized. Therefore, approval of the Authorized Share Increase and any subsequent issuance of additional shares of common stock would not affect a current common stockholder's rights as a stockholder, except for any dilutive effects of a potential increase in the number of outstanding shares of common stock to, among other things, earnings per share, book value per share, and the voting power of current holders of our common stock. The Authorized Share Increase would not have any immediate dilutive effect on the proportionate voting power or other rights of existing stockholders until additional shares are issued.

As is true for shares presently authorized but unissued, the future issuance of common stock authorized by the Authorized Share Increase may, among other things, decrease existing stockholders' percentage equity ownership and, depending on the price at which they are issued, could be dilutive to the voting rights of existing stockholders and have a negative effect on the market price of the common stock.

#### **Potential Anti-takeover Effects of the Authorized Share Increase**

Release No. 34-15230 of the staff of the SEC requires disclosure and discussion of the effects of any action, including the proposals discussed herein, that may be used as an anti-takeover mechanism. Since the Authorized Share Increase will provide that the number of authorized shares of common stock will be 200,000,000, the Authorized Share Increase, if effected, will result in a relative increase in the number of authorized but unissued shares of our common stock vis-à-vis the outstanding shares of our common stock and, could, under certain circumstances, have an anti-takeover effect, although this is not the purpose or intent of our Board of Directors. A relative increase in the number of authorized shares of common stock could have other effects on our stockholders, depending upon the exact nature and circumstances of any actual issuances of authorized but unissued shares. A relative increase in our authorized shares could potentially deter takeovers, including takeovers that our Board of Directors has determined are not in the best interest of our stockholders, in that additional shares could be issued (within the limits imposed by applicable law and the NYSE American) in one or more transactions that could make a change in control or takeover more difficult. For example, we could issue additional shares without further stockholder approval so as to dilute the stock ownership or voting rights of persons seeking to obtain control without our agreement. Similarly, the issuance of additional shares to certain persons allied with our management could have the effect of making it more difficult to remove our current management by diluting the stock ownership or voting rights of persons seeking to cause such removal. The Authorized Share Increase therefore may have the effect of discouraging unsolicited takeover attempts. By potentially discouraging initiation of any such unsolicited takeover attempts, the Authorized Share Increase may limit the opportunity for our stockholders to dispose of their shares at the higher price generally available in takeover attempts or that may be available under a merger proposal.

We have not proposed the increase in the number of authorized shares of common stock with the intention of using the additional authorized shares for anti-takeover purposes, but we would be able to use the additional shares to oppose a hostile takeover attempt or delay or prevent changes in our control or our management. Although the Authorized Share Increase has been prompted by business and financial considerations and not by the threat of any known or threatened hostile takeover attempt, stockholders should be aware that the effect of the Authorized Share Increase could facilitate future attempts by us to oppose changes in our control and perpetuate our management, including transactions in which the stockholders might otherwise receive a premium for their shares over then current market prices. We cannot provide assurances that any such transactions will be consummated on favorable terms or at all, that they will enhance stockholder value, or that they will not adversely affect our business or the trading price of the common stock.

**Consequences if Stockholder Approval for Proposal Is Not Obtained**

If stockholder approval for Proposal No. 3 is not obtained, we will not be able to file a certificate of amendment to our Articles of Incorporation to effect the Authorized Share Increase, and our limited number of authorized shares of the common stock that are neither outstanding nor reserved for issuance could adversely affect our ability to raise capital through equity financings, engage in other transactions and cure our stockholders equity deficiency.

**Vote Required to Approve Authorized Share Increase**

Approval of the certificate of amendment to our Articles of Incorporation included as Appendix A, and to authorize our Board of Directors to effect the Authorized Share Increase requires an affirmative vote of a majority of the common stock outstanding and entitled to vote at the 2018 Annual Meeting of Stockholders as of the record date. Abstentions and broker non-votes (to the extent a broker does not exercise its authority to vote, although we do not expect any broker non-votes) will have the same effect as “against” votes.

**Recommendation**

**OUR BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE FOR APPROVAL OF THE AMENDMENT TO OUR ARTICLES OF INCORPORATION TO INCREASE THE NUMBER OF AUTHORIZED SHARES OF COMMON STOCK.**

**PROPOSAL 4**

**THE ADJOURNMENT OF THE ANNUAL MEETING**

Our stockholders are being asked to consider and vote upon an adjournment of the 2018 Annual Meeting of Stockholders, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of approval of a proposed amendment to our Articles of Incorporation, as amended, to effectuate the Authorized Share Increase described in Proposal 3. If we fail to receive a sufficient number of votes to approve Proposal 3, we may propose to adjourn the 2018 Annual Meeting of Stockholders for a period of not more than 30 days, for the purpose of soliciting additional proxies to approve Proposal 3. We currently do not intend to propose adjournment of the 2018 Annual Meeting of Stockholders if there are sufficient votes in favor of Proposal 3.

**Vote Required**

Approval of the adjournment of the 2018 Annual Meeting of Stockholders requires an affirmative vote of a majority of the votes properly cast for or against this proposal at the 2018 Annual Meeting of Stockholders. Accordingly, abstentions on this proposal will have the same effect as a vote against the proposal. Broker non-votes (to the extent a broker does not exercise its authority to vote) will not be counted towards, and will have no effect on, the vote total for this proposal.

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE TO APPROVE THE ADJOURNMENT OF THE ANNUAL MEETING, IF A QUORUM IS PRESENT, TO SOLICIT ADDITIONAL PROXIES IF THERE ARE NOT SUFFICIENT VOTES TO APPROVE PROPOSAL 3, AND PROXIES SOLICITED BY THE BOARD WILL BE VOTED IN FAVOR OF THE ADJOURNMENT UNLESS A STOCKHOLDER HAS INDICATED OTHERWISE ON THE PROXY.**

## PROPOSAL 5

### APPROVAL OF AN AMENDMENT TO OUR 2010 STOCK INCENTIVE PLAN TO INCREASE THE NUMBER OF SHARES OF COMMON STOCK THAT WE WILL HAVE AUTHORITY TO GRANT UNDER THE PLAN BY 500,000 (AFTER GIVING EFFECT TO THE REVERSE STOCK SPLIT.)

In November 2010, the Board of Directors adopted, and our stockholders subsequently approved, the Plan. The maximum number of shares authorized for issuance under the Plan is subject to adjustment for certain events, such as the Reverse Stock Split that we announced on August 1, 2018 and expect to effect on August 1, 2018. As of August 1, 2018, there were 199,120 shares of common stock available for grant under the Plan (after giving effect to the Reverse Stock Split) and no shares of common stock available for grant under any other plan.

As of August 3, 2018, 11,456,257 shares of common stock subject to awards were outstanding under the Plan and 712,258 shares of common stock subject to awards were outstanding under the 2007 Stock Incentive Plan which numbers will be reduced to 381,875 and 23,741 after giving effect to the Reverse Stock Split. In an effort to preserve cash and to attract, retain and motivate persons who make important contributions to our business, we like the flexibility of issuing securities to our officers, directors, employees, and consultants. The Plan currently only has a limited number of shares of common stock reserved for issuance. Management believes that the number of shares of common stock currently available for issuance under the Plan is insufficient to meet its needs to provide for awards to the Plan participants for the next 12 months and insufficient in order to allow us the ability to compete successfully for talented employees and consultants, especially due to the fact that recently our per share price has hovered at historically low prices. In addition to providing flexibility to grant a greater number of awards under the Plan, the increase is also appropriate in view of the potentially significant increase in the number of individuals who will be eligible to receive awards under the Plan. It is anticipated that over the next year our number of employees will increase as we continue pursuit of our commercial and clinical development programs and pre-clinical studies.

Under our current forecasts, primarily due to our lower stock prices, the Plan will run out of shares available for grant within the next twelve months; therefore, we must ensure that we have sufficient equity to issue under the Plan to our employees, directors and consultants. This assumes that we continue to grant awards having a value consistent with our historical usage and current practices, as reflected in our burn rate discussed below, and noting that future circumstances may require us to change our current equity grant practices.

In an effort to preserve cash and to attract, retain and motivate persons who make important contributions to our business, our Board of Directors has approved, subject to stockholder approval, the amendment to the Plan to increase by 500,000 (after giving effect to the Reverse Stock Split) the number of shares that may be granted under the Plan. The amendment to our Plan will increase the total number of shares of common stock with respect to which awards may be granted under the Plan from 500,000 (after giving effect to the Reverse Stock Split) to 1,000,000 (after giving effect to the Reverse Stock Split) and updates certain provisions in connection with the Tax Cuts and Jobs Act of 2017 (the Tax Act).

If Proposal 5 is approved by our stockholders, the amendments to the Plan will become effective upon the date of the 2018 Annual Meeting. In the event stockholders do not approve Proposal 5, the amendments to the Plan will not become effective and the Plan will continue in its current form. Without the amendments we believe the common stock available for grant under the Plan will be insufficient to meet our anticipated recruiting and retention needs.

The principal provisions of the Plan, as amended, are summarized below and the Plan, which incorporates the amendment to the Plan discussed above, is attached hereto as Appendix B. The following discussion is qualified in its entirety by reference to the Plan.

#### ***Purpose of the Plan***

The Board of Directors believes that the Plan is necessary for us to attract, retain and motivate our employees, directors and consultants through the grant of stock options, stock appreciation rights, restricted stock, restricted stock units and other equity-based or equity-related awards. We believe the Plan

is best designed to provide the proper incentives for our employees, directors and consultants, ensures our ability to make performance-based awards, and meets the requirements of applicable law. There are currently 30 individuals that would be eligible to participate in the Plan, of which five are directors or executive officers and 25 are employees.

We manage our long-term stockholder dilution by limiting the number of equity incentive awards granted annually. The Board of Directors monitors our annual stock award Burn Rate, Dilution and Overhang (each as defined below), among other factors, in its efforts to maximize stockholders' value by granting what, in the Board of Directors' judgment, are the appropriate number of equity incentive awards necessary to attract, reward, and retain employees, consultants and directors. The table below illustrates our Burn Rate, Dilution, and Overhang for the past three fiscal years with details of each calculation noted below the table.

	2017	2016	2015
<b>Burn Rate</b> <sup>(1)</sup>	<b>2.54%</b>	<b>4.10%</b>	<b>4.69%</b>
<b>Dilution</b> <sup>(2)</sup>	<b>12.37%</b>	<b>11.46%</b>	<b>10.40%</b>
<b>Overhang</b> <sup>(3)</sup>	<b>8.56%</b>	<b>8.79%</b>	<b>8.82%</b>

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- (1) Burn Rate is the number of shares subject to equity awards granted during a fiscal year/weighted average common shares outstanding for that fiscal year.
- (2) Dilution is (the number of shares subject to equity awards + the number of shares available for future awards at the end of a fiscal year)/(number of shares outstanding at the end of the fiscal year + number of share subject to equity awards + number of shares available for future awards).
- (3) Overhang is (the number of shares subject to equity awards at the end of a fiscal year)/(number of shares outstanding at the end of the fiscal year + number of shares subject to equity awards + number of shares available for future awards).

#### ***Administration***

The Plan generally is administered by the Compensation Committee of our Board of Directors. The administrator of the Plan has full authority to establish rules and regulations for the proper administration of the Plan, to select the employees, directors and consultants to whom awards are granted, and to set the date of grant, the type of award and the other terms and conditions of the awards, consistent with the terms of the Plan. The administrator of the Plan may modify outstanding awards as provided in the Plan.

#### ***Limitation on Awards and Shares Available***

As of August , 2018, there were 170,674 shares of our common stock available for grants that may be made under the Plan (after giving effect to the Reverse Stock Split).

#### ***Eligibility***

Persons eligible to participate in the Plan include all of our employees, directors and consultants.

#### ***Awards***

The Plan provides for the grant of: (i) incentive stock options; (ii) nonqualified stock options; (iii) stock appreciation rights; (iv) restricted stock; (v) restricted stock units; and (vi) other stock-based awards to eligible individuals. The terms of the awards will be set forth in an award agreement, consistent with the terms of the Plan. No stock option will be exercisable later than ten years after the date it is granted.

The Plan administrator is authorized to grant awards intended to qualify as "performance-based compensation" under Section 162(m) of the Internal Revenue Code of 1986, as amended (the "Code"). See "— Alternative Minimum Tax; Tax Deductibility of Compensation" below.

**Stock Options.** The Plan administrator may grant incentive stock options as defined in Section 422 of the Code and nonqualified stock options. Options shall be exercisable for such prices, shall expire at such times, and shall have such other terms and conditions as the Plan administrator may determine at the time of grant and as set forth in the award agreement; however, the exercise price must be at least equal to 100% of the fair market value at the date of grant. The option price is payable in cash or other consideration acceptable us.

**Stock Appreciation Rights.** The Plan administrator may grant stock appreciation rights with such terms and conditions as the administrator may determine at the time of grant and as set forth in the award agreement. The grant price of a stock appreciation right shall be determined by the administrator and shall be specified in the award agreement; however, the grant price must be at least equal to 100% of the fair market value of a share on the date of grant. Stock appreciation rights may be exercised upon such terms and conditions as are imposed by the Plan administrator and as set forth in the stock appreciation right award agreement.

**Restricted Stock.** Restricted stock may be granted in such amounts and subject to the terms and conditions as determined by the Plan administrator at the time of grant and as set forth in the award agreement. The administrator may impose performance goals for restricted stock. The administrator may authorize the payment of dividends on the restricted stock during the restricted period.

**Restricted Stock Units.** The Plan administrator may grant restricted stock units in such amounts and subject to the terms and conditions as determined by the Plan administrator at the time of grant. Restricted stock units may be awarded independently of or in connection with any other award under the Plan.

**Other Awards.** The Plan administrator may grant other types of equity-based or equity-related awards not otherwise described by the terms of the Plan, in such amounts and subject to such terms and conditions as the administrator shall determine. Such awards may be based upon attainment of performance goals established by the administrator and may involve the transfer of actual shares to participants, or payment in cash or otherwise of amounts based on the value of shares.

#### ***Adjustments Upon Changes in Common Stock***

In the event of any change in the number of shares of common stock outstanding by reason of any stock dividend or split, reverse stock split, recapitalization, merger, consolidation, combination or exchange of shares or similar corporate change, the maximum number of shares of the common stock with respect to which the Plan administrator may grant awards under the Plan and the individual annual limit described in the Plan, shall be appropriately adjusted by the Plan administrator. In the event of any change in the number of shares of the common stock outstanding by reason of any other event or transaction, the Plan administrator may, but need not, make such adjustments in the number and class of shares of the common stock with respect to which awards: (i) may be granted under the Plan, and (ii) granted to any one of our employees or a subsidiary during any one calendar year, in each case as the Plan administrator may deem appropriate, unless such adjustment would cause any award that would otherwise qualify as performance based compensation with respect to a “162(m) covered employee” (as defined in Section 162 of the Code), to cease to so qualify, if Section 162(m) of the Code is applicable.

#### **Corporate Transactions**

In the event of (i) our dissolution or liquidation, (ii) a sale of all or substantially all of our assets, (iii) a merger or consolidation involving our company in which we are not the surviving corporation; or (iv) a merger or consolidation involving our company in which we are the surviving corporation but the holders of shares of the common stock receive securities of another corporation and/or other property, including cash, the Plan administrator shall, in its absolute discretion, have the power to:

- cancel each option and stock appreciation right outstanding immediately prior to the event and make a payment to the grantee equal to the excess of (a) the value, as determined in the absolute discretion of the Plan administrator, of the property received by a holder of common stock as a result of the event over (b) the exercise price otherwise payable in connection with the stock;



- cancel each option and stock appreciation right outstanding immediately prior to the event and make a payment to the grantee equal to property received by a holder of common stock as a result of the event; or
- provide for the exchange of each option and stock appreciation right outstanding immediately prior to such event (whether or not then exercisable) for an option on or stock appreciation right with respect to, as appropriate, some or all of the property which a holder of the number of shares of the common stock subject to such option or stock appreciation right would have received and, incident thereto, make an equitable adjustment as determined by the Plan administrator in its absolute discretion in the exercise price of the option or stock appreciation right, or the number of shares or amount of property subject to the option or stock appreciation right or, if appropriate, provide for a cash payment to the grantee to whom such option or stock appreciation right was granted in partial consideration for the exchange of the option or stock appreciation right.

#### ***Amendment and Termination***

Our Board of Directors may amend the Plan at any time, subject to stockholder approval to the extent required by applicable law or regulation or the listing standards of the NYSE American or any other market or stock exchange on which the common stock is at the time primarily traded. Additionally, stockholder approval will be specifically required to (i) increase the number of shares available for issuance under the Plan; or (ii) decrease the exercise price of any outstanding option or stock appreciation right granted under the Plan.

Our Board of Directors may terminate the Plan at any time. Unless sooner terminated by our Board of Directors, the Plan will terminate on the close of business on September 27, 2020, ten years from the original effective date.

#### ***Miscellaneous***

The Plan also contains provisions with respect to payment of exercise prices, vesting and expiration of awards, treatment of awards upon the sale of our company, transferability of awards, and tax withholding requirements. Various other terms, conditions, and limitations apply, as further described in the Plan.

#### ***Federal Income Tax Consequences***

The following is a brief description of the principal federal income tax consequences, as of the date of this Proxy Statement, associated with the grant of awards under the Plan. This summary is based on our understanding of present United States federal income tax law and regulations. The summary does not purport to be complete or applicable to every specific situation. Furthermore, the following discussion does not address foreign, state or local tax consequences.

#### ***Options***

Grant. There is generally no United States federal income tax consequence to the participant solely by reason of the grant of incentive stock options or nonqualified stock options under the Plan, assuming the exercise price of the option is not less than the fair market value of the shares on the date of grant.

Exercise. The exercise of an incentive stock option is not a taxable event for regular federal income tax purposes if certain requirements are satisfied, including the requirement that the participant generally must exercise the incentive stock option no later than three months following the termination of the participant's employment with us. However, such exercise may give rise to alternative minimum tax liability (see "Alternative Minimum Tax" below). Upon the exercise of a nonqualified stock option, the participant will generally recognize ordinary income in an amount equal to the excess of the fair market value of the shares at the time of exercise over the amount paid by the participant as the exercise price. The ordinary income recognized in connection with the exercise by a participant of a nonqualified stock option will be subject to both wage and employment tax withholding, and we generally will be entitled to a corresponding deduction.

The participant's tax basis in the shares acquired pursuant to the exercise of an option will be the amount paid upon exercise plus, in the case of a nonqualified stock option, the amount of ordinary income, if any, recognized by the participant upon exercise thereof.

Qualifying Disposition. If a participant disposes of shares of our common stock acquired upon exercise of an incentive stock option in a taxable transaction, and such disposition occurs more than two years from the date on which the option was granted and more than one year after the date on which the shares were transferred to the participant pursuant to the exercise of the incentive stock option, the participant will realize long-term capital gain or loss equal to the difference between the amount realized upon such disposition and the participant's adjusted basis in such shares (generally the option exercise price).

Disqualifying Disposition. If the participant disposes of shares of our common stock acquired upon the exercise of an incentive stock option (other than in certain tax free transactions) within two years from the date on which the incentive stock option was granted or within one year after the transfer of shares to the participant pursuant to the exercise of the incentive stock option, at the time of disposition the participant will generally recognize ordinary income equal to the lesser of: (i) the excess of each such share's fair market value on the date of exercise over the exercise price paid by the participant, or (ii) the participant's actual gain. If the total amount realized on a taxable disposition (including return on capital and capital gain) exceeds the fair market value on the date of exercise of the shares of our common stock purchased by the participant under the option, the participant will recognize a capital gain in the amount of the excess. If the participant incurs a loss on the disposition (the total amount realized is less than the exercise price paid by the participant), the loss will be a capital loss.

Other Disposition. If a participant disposes of shares of our common stock acquired upon exercise of a nonqualified stock option in a taxable transaction, the participant will recognize capital gain or loss in an amount equal to the difference between the participant's basis (as discussed above) in the shares sold and the total amount realized upon disposition. Any such capital gain or loss (and any capital gain or loss recognized on a disqualifying disposition of shares of our common stock acquired upon exercise of incentive stock options as discussed above) will be short-term or long-term depending on whether the shares of our common stock were held for more than one year from the date such shares were transferred to the participant.

Alternative Minimum Tax: Tax Deductibility of Compensation. Alternative minimum tax is payable if and to the extent the amount thereof exceeds the amount of the taxpayer's regular tax liability, and any alternative minimum tax paid generally may be credited against future regular tax liability (but not future alternative minimum tax liability).

Alternative minimum tax applies to alternative minimum taxable income. Generally, regular taxable income as adjusted for tax preferences and other items is treated differently under the alternative minimum tax.

For alternative minimum tax purposes, the spread upon exercise of an incentive stock option (but not a nonqualified stock option) will be included in alternative minimum taxable income, and the taxpayer will receive a tax basis equal to the fair market value of the shares of our common stock at such time for subsequent alternative minimum tax purposes. However, if the participant disposes of the incentive stock option shares in the year of exercise, the alternative minimum taxable income cannot exceed the gain recognized for regular tax purposes, provided that the disposition meets certain third-party requirements for limiting the gain on a disqualifying disposition. If there is a disqualifying disposition in a year other than the year of exercise, the income on the disqualifying disposition is not considered alternative minimum taxable income.

There are no federal income tax consequences to us by reason of the grant of incentive stock options or nonqualified stock options or the exercise of an incentive stock option (other than disqualifying dispositions). At the time the participant recognizes ordinary income from the exercise of a nonqualified stock option, we will be entitled to a federal income tax deduction in the amount of the ordinary income so recognized (as described above), provided that we satisfy our reporting obligations described below. To the extent the participant recognizes ordinary income by reason of a disqualifying disposition of the stock

acquired upon exercise of an incentive stock option, and subject to the requirement of reasonableness, the applicable provisions of Section 162(m) of the Code and the satisfaction of a tax reporting obligation, we generally will be entitled to a corresponding deduction in the year in which the disposition occurs. Prior to the enactment of the Tax Cut and Jobs Act of 2017 (the “Tax Act”), Section 162(m) of the Code precluded a public corporation from taking a tax deduction for certain compensation in excess of \$1.0 million in any one year paid to its Chief Executive Officer or any of its three other highest-paid executive officers (not including our Chief Financial Officer), unless certain specific and detailed criteria are satisfied. However, certain qualifying “performance-based” compensation (that is, compensation paid under a plan administered by a committee of outside directors, based on achieving objective performance goals, the material terms of which were approved by shareholders) was not subject to the \$1.0 million deduction limit. With the passage of the Tax Act, only qualifying performance-based compensation paid pursuant to a binding written contract in effect on November 2, 2017 (and not modified in any material respect on or after November 2, 2017) as set forth under the Tax Act will be eligible for the deduction exception. The Tax Act also expanded the executive officers covered by Section 162(m) of the Code to include the chief financial officer position as well as any person who ever was a covered executive for any prior taxable year, beginning after December 31, 2016. As a result of these changes, starting in 2018, most compensation payable to any person who was a named executive officer of the Company since fiscal year 2016 will not be deductible, regardless of whether the compensation is performance-based.

For our chief executive officer, chief financial officer, and for the individuals serving as officers who are among the three highest compensated officers (other than the chief executive officer and chief financial officer) for proxy reporting purposes, Section 162(m) of the Code limits the amount of compensation otherwise deductible by us to \$1.0 million per year for each such individual. We are required to report to the Internal Revenue Service any ordinary income recognized by any participant by reason of the exercise of a nonqualified stock option. We are required to withhold income and employment taxes (and pay the employer’s share of the employment taxes) with respect to ordinary income recognized by the participant upon exercise of nonqualified stock options.

#### ***Stock Appreciation Rights***

There are generally no tax consequences to the participant or us by reason of the grant of stock appreciation rights. In general, upon exercise of a stock appreciation rights award, the participant will recognize taxable ordinary income equal to the excess of the stock’s fair market value on the date of exercise over the stock appreciation rights’ base price, or the amount payable. Generally, with respect to employees, we are required to withhold from regular wages or supplemental wage payments an amount based on the ordinary income recognized. Subject to the requirement of reasonableness, the provisions of Section 162(m) of the Code (if applicable) and the satisfaction of a tax reporting obligation, we generally will be entitled to a business expense deduction equal to the taxable ordinary income realized by the participant.

#### ***Restricted Stock***

Unless a participant makes a Section 83(b) election, as described below, with respect to restricted stock granted under the Plan, a participant receiving such an award will not recognize U.S. taxable ordinary income and we will not be allowed a deduction at the time such award is granted. While an award remains unvested or otherwise subject to a substantial risk of forfeiture, a participant will recognize compensation income equal to the amount of any dividends received and we will be allowed a deduction in a like amount. When an award vests or otherwise ceases to be subject to a substantial risk of forfeiture, the excess of the fair market value of the award on the date of vesting or the cessation of the substantial risk of forfeiture over the amount paid, if any, by the participant for the award will be ordinary income to the participant and will be claimed as a deduction for federal income tax purposes by us. Upon disposition of the shares received, the gain or loss recognized by the participant will be treated as capital gain or loss, and the capital gain or loss will be short-term or long-term depending upon whether the participant held the shares for more than one year following the vesting or cessation of the substantial risk of forfeiture.

However, by filing a Section 83(b) election with the Internal Revenue Service within 30 days after the date of grant, a participant’s ordinary income and commencement of holding period and the deduction will be determined as of the date of grant. In such a case, the amount of ordinary income recognized by such a

participant and deductible by us will be equal to the excess of the fair market value of the award as of the date of grant over the amount paid, if any, by the participant for the award. If such election is made and a participant thereafter forfeits his or her award, no refund or deduction will be allowed for the amount previously included in such participant's income.

Generally, with respect to employees, we are required to withhold from regular wages or supplemental wage payments an amount based on the ordinary income recognized. Subject to the requirement of reasonableness, the provisions of Section 162(m) of the Code (if applicable) the satisfaction of a tax reporting obligation and any tax withholding condition, we generally will be entitled to a business expense deduction equal to the taxable ordinary income realized by the recipient. Upon disposition of stock, the recipient will recognize a capital gain or loss equal to the difference between the selling price and the sum of the amount paid for such stock, if any, plus any amount recognized as ordinary income upon acquisition (or vesting) of the stock. Such gain or loss will be long- or short-term depending on whether the stock was held for more than one year from the date ordinary income is measured.

#### ***Outstanding Options under the Plan***

Beginning in November 2010, we have granted 11,456,257 (327,322 post Reverse Stock Split) options with a weighted average exercise price of \$54.25 (post Reverse Stock Split) under the Plan.

#### ***New Plan Benefits***

As of the date of this Proxy Statement, we are unable to determine any grants of awards under the Plan that will be made.

#### ***Existing Plan Benefits***

The following table sets forth information with respect to options and other awards previously granted under the Plan, as adjusted to take into account the Reverse Stock Split.

<b>2010 Stock Incentive Plan</b>	
<b>Name and position</b>	<b>Number of shares subject to grant</b>
Steven A. Shallcross, Interim Chief Executive Officer and Chief Financial Officer	58,572
Joseph Sliman, Chief Medical Officer	45,193
Jeffrey J. Kraws, Chairman of the Board of Directors	21,393
Scott L. Tarriff, Director	18,536
Jeffrey Wolf, Director	18,536
All Current Executive Officers as a Group (two (2) persons)	103,764
All Current Non-Executive Directors as a Group (three (3) persons)	58,465

**OUR BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT YOU VOTE FOR THE AMENDMENT TO OUR 2010 STOCK INCENTIVE PLAN TO INCREASE THE NUMBER OF SHARES OF COMMON STOCK AVAILABLE THAT WE WILL HAVE AUTHORITY TO GRANT.**

## COMPENSATION DISCUSSION AND ANALYSIS

### Overview of Our Compensation Program

#### A. Philosophy and Objectives

The Compensation Committee seeks to attract and retain executive talent by offering competitive base salaries, bonuses and long-term incentives. The Compensation Committee's philosophy is to provide a compensation package that attracts and retains superior executive talent and delivers higher rewards for superior performance and consequences for underperformance. It is also the Compensation Committee's practice to provide a balanced mix of cash and equity-based compensation that aligns both the short and long-term interests of our executives with that of our stockholders. Our executive compensation program is based on the following philosophies and objectives:

- *Compensation Should Align with Stockholders' Interests* — The Compensation Committee believes that executives' interests should be aligned with those of the stockholders. Executives are granted stock options so that their total compensation is tied directly to the same value realized by our stockholders. Executive bonuses are tied directly to the value that we gain from an executive's contribution to our success as a whole.
- *Compensation is Competitive* — The Compensation Committee seeks to provide a total compensation package that attracts, motivates and retains the executive talent that we need in order to maximize its return to stockholders. To accomplish this objective, executive compensation is reviewed annually to ensure that compensation levels are competitive and reasonable given our level of performance and other comparable companies with which we compete for talent.
- *Compensation Motivates and Rewards the Achievement of Goals* — Our executive compensation program is designed to appropriately reward both individual and collective performance that meets and exceeds our annual, long-term and strategic goals. To accomplish this objective, a substantial percentage of total compensation is variable, "at risk", both through annual incentive compensation and the granting of long-term incentive awards.

#### B. Compensation Administration

##### *Role of the Compensation Committee*

Pursuant to the terms of its charter, the Compensation Committee is responsible for the review of all aspects of our executive compensation program and makes decisions regarding the compensation of the Named Executive Officers. Our Named Executive Officers for the year ended December 31, 2017 were as follows: Steven Shallcross, our Chief Financial Officer and since December 5, 2017 our Interim Chief Executive Officer; Joseph Sliman, our Chief Medical Officer and Jeff Riley, our Former Chief Executive Officer.

The Compensation Committee's responsibilities include but are not limited to the following:

- Establishing on an annual basis the performance goals and objectives for purposes of determining the compensation of our Chief Executive Officer and other senior executive officers.
- Evaluating the Chief Executive Officer's and other Named Executive Officer's performance at least annually in light of those goals and objectives, and based upon these evaluations setting the compensation level for those officers.
- Reviewing the competitive position of, and making recommendations to, the Board of Directors with respect to the cash-based and equity-based compensation plans and our programs relating to compensation and benefits.
- Overseeing administration of our stock option plan and incentive compensation plans, making recommendations to the Board of Directors regarding the granting of options and incentives and otherwise assisting the Board of Directors in administering awards under these plans.
- Reviewing the financial performance and operations of our major benefit plans.

Additional information regarding the Compensation Committee's responsibilities is set forth in its charter, which is posted on our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com).

### ***Role of the Chief Executive Officer***

The Chief Executive Officer makes recommendations to the Compensation Committee regarding the compensation of our other Named Executive Officers. The Chief Executive Officer does not participate in any discussions or processes concerning his own compensation and participates in a non-voting capacity in discussions or processes concerning the compensation of our Chief Medical Officer and other members of management. In addition to the Chief Executive Officer, our other Named Executive Officers, as well as members of our management and our legal department also attend Compensation Committee meetings from time to time and may take part in discussions of executive compensation.

### **C. Program Design**

The Compensation Committee uses a simple and straightforward approach in compensating our Named Executive Officers in which base salary, annual incentives and stock options are the principal components. In addition, executive officers generally participate in the same benefit programs as other full-time employees.

Our executive compensation program is designed to provide executives with a reasonable level of fixed compensation through base salary and benefits, and an opportunity to earn incentive compensation through the annual and long-term incentive programs based on a mix of individual and corporate performance, individual performance and the value of our stock. We do not currently have formal policies for allocating compensation among base salary, performance-based bonus and equity awards. Instead our Compensation Committee uses its judgment to establish a total direct compensation opportunity for each Named Executive Officer that is a mix of current, short-term and long-term incentive compensation and cash and non-cash compensation that it believes appropriate to achieve the goals of our executive compensation program and corporate objectives. Our target pay mix places a significant emphasis on performance based variable compensation. The incentive plans are designed to pay well when performance meets or exceeds expectations and pay little or no incentive if performance is below expectations.

In designing and implementing our executive compensation program, our Compensation Committee considers our operating and financial objectives, including our risk profile, and the effect that its executive compensation decisions will have on encouraging our executive officers to take an appropriate level of business risk consistent with our overall goal of enhancing long-term stockholder value. In particular, the Compensation Committee considers those business risks identified in our risk factors and the known trends and uncertainties identified in our management discussion and analysis and considers how our executive compensation program serves to achieve our operating and financial objectives while at the same time mitigating any incentives for our executive officers to engage in excessive risk-taking to achieve short-term results that may not be sustainable in the long-term.

As an executive's level of responsibility increases, the Compensation Committee generally targets a greater portion of the executive's compensation to be contingent upon performance. For example, historically our Named Executive Officers have a higher percentage of compensation at risk (and thus greater upside and downside potential) relative to our other employees. The Compensation Committee believes this is appropriate because our Named Executive Officers have the greatest influence on our performance. During 2017, salaries for our Chief Financial Officer and Chief Medical Officer were 43% and 43% of their compensation packages and performance based variable compensation comprised 47% and 51% of the compensation packages. Due to his resignation as our Chief Executive Officer on December 4, 2017, Mr. Riley did not receive any long-term incentive compensation for his performance during 2017, therefore, a comparison of the salary and variable compensation for Mr. Riley for 2017 is not provided. Of the performance based variable compensation there was a fairly even emphasis on equity incentive performance-based compensation and cash compensation.

#### D. Compensation Review Process

The Compensation Committee annually reviews compensation for our Named Executive Officers. The Compensation Committee considers the executive's role and responsibilities, corporate and individual performance, and industry-wide compensation practices and trends for other companies of similar size. This approach is used to set base salaries, bonuses, stock option award levels and the mix of compensation elements.

We strive to attract and retain the most highly qualified executive officers in an extremely competitive market. Our Compensation Committee believes that it is important when making its compensation decisions to be informed as to the competitive market for executive talent, including the current practices of comparable public companies with which we compete for such talent. Consequently, our Compensation Committee reviews market data for each executive officer's position, compiled by Korn Ferry Hay Group as described below.

Our Compensation Committee considered whether Korn Ferry Hay Group had any conflicts of interest in advising the Committee. In doing so, the Committee considered whether Korn Ferry Hay Group had been providing services of any other nature to us; the amount of fees received from us by Korn Ferry Hay Group; the policies and procedures adopted by Korn Ferry Hay Group that have been designed to prevent conflicts of interest; whether any business or personal relationships existed between the consultants employed by Korn Ferry Hay Group who worked on our matters and any member of the Committee; whether any business or personal relationship existed between such consultants and any of our executive officers; and whether Korn Ferry Hay Group or such consultants hold any of our common stock. Upon evaluating such considerations, the Committee found no conflicts of interest in Korn Ferry Hay Group advising the Committee.

When making compensation decisions, the Compensation Committee believes that it is important to be informed as to the competitive market for executive talent, including the current practices of comparable public companies with which we compete for such talent. For purposes of making compensation decisions, the Compensation Committee compares the compensation for our Named Executive Officers with the compensation at several comparable companies. In setting 2017 base salary for our Named Executive Officers, the Compensation Committee utilized a number of resources, which included an internal analysis of biotechnology companies that had fewer than 100 employees, had revenues of less than \$150 million and had a median market capitalization of less than \$500 million and a compensation survey prepared by Top 5 Data Services, Inc. In setting 2017 bonuses and 2018 base compensation for our Named Executive Officers, the Compensation Committee engaged Korn Ferry Hay Group to provide an assessment of our compensation program relative to our peer group comprised of the 20 publicly-traded companies listed below, with a focus on similarly situated companies in the biotechnology and pharmaceutical industries. For the peer group median total revenue was approximately \$3 million, median market capitalization was approximately \$295 million and total number of employees was 69. The Compensation Committee believes that the companies selected in the peer group were comparable to us, and represented our labor market for talent for key leadership positions at the time 2017 compensation determinations were made. Korn Ferry Hay Group competitive market data was obtained from Standard & Poor's Capital IQ. The following were identified as comparable peer companies for Korn Ferry Hay Group assessment:

Acelrx Pharmaceuticals Inc.	Achaogen Inc.	Achillion Pharmaceuticals	Ardelyx Inc.
Argos Therapeutics Inc.	Assembly Biosciences	Athersys Inc.	Cempra Inc.
Concert Pharmaceuticals Inc.	Cytrx Corp	Flexion Therapeutics Inc.	GTX Inc.
Ironwood Pharmaceuticals, Inc.	Protein Therapeutics Inc.	Seres Therapeutics Inc.	Soligenix, Inc.
Sucampo Pharmaceuticals, Inc.	Synergy Pharmaceuticals, Inc.	Tetraphase Pharmaceuticals	Vitality Biopharma Inc.

Based on data from Korn Ferry Hay Group report, the Compensation Committee was able to compare the overall compensation for the Named Executive Officers. This included the following compensation variables: (1) Base Salary, (2) Total Cash Compensation, (3) Long-term Incentives, and (4) Total Direct Compensation. The Compensation Committee chose to use the aggregate of the compensation variables for each management position on which the comparative analysis was performed. Using the data from the

Korn Ferry Hay Group report that covered the compensation variables, our Compensation Committee was able to compare those data with the overall compensation for our members of top management. This included separate analyses for our Chief Financial Officer and Chief Medical Officer, respectively. The Compensation Committee considers compensation data from the peer companies to the extent the executive positions at these companies are considered comparable to our positions and informative of the competitive environment. This information was gathered and analyzed for the 25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup> percentiles for annual base salary, bonuses and long-term incentive pay elements. While the Compensation Committee does take into consideration such peer data, the Committee does not attempt to benchmark our executive compensation against any specific level, range, or percentile of compensation paid at any other companies, does not apply any specific measures of internal or external pay equity in reaching its conclusions, and does not employ tally sheets, wealth accumulation, or similar tools in its analysis. Rather, the Compensation Committee reviews compensation data from the peer group companies, as reference points in making executive compensation decisions. The Compensation Committee's general aim is for our compensation to remain competitive with the market, falling above or below the median of the market data as appropriate based on corporate and individual executive performance, and other factors deemed to be appropriate. Competitive market positioning is only one of several factors, as described below, that the Compensation Committee considers in making compensation decisions, and therefore individual Named Executive Officer compensation may fall at varying levels as compared to the market data.

Our Chief Financial Officer and Chief Medical Officer were found to have overall compensation levels that were competitive with the peer group.

Our Compensation Committee values the opinion of our stockholders. At our 2016 Annual Meeting of Stockholders approximately 67% of the votes were cast in favor of our say-on-pay proposal adopting a resolution approving the compensation paid to our Named Executive Officers as disclosed in our proxy statement for our 2016 Annual Meeting of Stockholders. In addition, at our 2016 Annual Meeting of Stockholders the greatest number of votes were cast in favor of a three (3) year frequency for holding an advisory vote on executive compensation. Accordingly, our Compensation Committee decided not to make any significant changes to the executive compensation policies; however, our Compensation Committee continues to monitor and evaluate our compensation program in light of our stockholders' views and our transforming business needs.

#### **E. Components of Compensation**

We provide four compensation components to Named Executive Officers:

- base salary;
- bonuses based on the achievement of specified goals and objectives;
- long-term incentives; and
- benefits

#### **Former Chief Executive Officer Compensation**

Jeffrey Riley served as our Chief Executive Officer and President from February 3, 2012 until his resignation on December 4, 2017. Prior to his resignation, he was compensated in accordance with his employment agreement and other benefits consistent with those provided to members of management. The details of the agreements relating to Mr. Riley's employment and his separation can be found under "— Employment Agreements and Separation Agreement — Jeffrey Riley, Former Chief Executive Officer and President." Mr. Riley's base salary for 2017 was \$550,000, which was the same as his base salary for 2016, and he was eligible for a target bonus of 75% of his base salary. In 2017, Mr. Riley received a \$200,000 cash bonus as part of his separation from our Company. Although Mr. Riley was not eligible for a long-term incentive award in 2017; he did receive the right to exercise vested stock options for one (1) year following December 5, 2017 and other benefits. Further details regarding amounts received by Mr. Riley upon his separation are set forth in the section entitled "— Employment Agreements and Separation Agreement — Jeffrey Riley, Former Chief Executive Officer and President."



## 1. Base Salaries

We provide our Named Executive Officers a base salary commensurate with their position, responsibilities and experience. In setting the base salary, the Compensation Committee considers the scope and accountability associated with each Named Executive Officer's position and such factors as performance and experience of each Named Executive Officer. We design base pay to provide the essential reward for an employee's work and are required to be competitive in attracting talent. Once base pay levels are initially determined, increases in base pay may be provided to recognize an employee's specific performance achievements. The base salaries are targeted to be competitive with other similar biotechnology companies. Base salaries for the Named Executive Officers are set by their respective employment contracts and are reviewed annually by the Compensation Committee. Our Chief Executive Officer, Chief Financial Officer and Chief Medical Officer typically make performance assessments of our other employees throughout the year, and provide ongoing feedback to employees, provide resources and maximize individual and team performance levels. Based on the analysis of the peer group and other comparative research performed by the Committee, the Committee was able to compare the base salary for the Chief Executive Officer, Chief Financial Officer and Chief Medical Officer, including base salary, long-term incentives and bonuses. It was determined that our former Chief Executive's Officer's salary was at the 50<sup>th</sup> percentile of the compensation of Chief Executive Officers for companies in the survey that was reviewed by the Compensation Committee in 2017 and that it was competitive with the peer group. Our former Chief Executive Officer, Mr. Riley, received an annual base salary of \$550,000 through the date he resigned from the Company, December 4, 2017. It was determined that the Chief Financial Officer's base salary was slightly below the peer group median and that the Chief Medical Officer's base salary was within a competitive range of market relative to similarly situated positions in the peer group. Therefore, the base salary for our Chief Financial Officer was increased by ten percent (10%) to \$381,150 in December 2017, to keep his salary competitive with those of similarly situated executives in companies with similar size market caps. In addition, Mr. Shallcross receives an additional \$8,000 per month for each month that he serves as Interim Chief Executive Officer. The current base salaries for our Chief Financial Officer and Chief Medical Officer are:

<u>Named Executive Officer</u>	<u>Base Salary</u>
Steven A. Shallcross, Interim Chief Executive Officer, Chief Financial Officer, Treasurer and Secretary	\$ 381,150 <sup>(1)</sup>
Joseph Sliman, Chief Medical Officer	\$ 385,000

(1) Does not include \$8,000 per month for serving as Interim Chief Executive Officer

## 2. Bonuses

The Compensation Committee also makes recommendations to the full Board of Directors for determining bonuses. The Compensation Committee also used information from the report and analysis discussed above in determining bonuses as well as its own research of peer company compensation. For the year ended December 31, 2017, the Compensation Committee approved a \$200,000 cash bonus and an option grant exercisable for 550,000 (15,714 post Reverse Stock Split) shares of our common stock for Mr. Shallcross, a \$216,563 cash bonus and an option grant exercisable for 410,000 (11,714 post Reverse Stock Split) shares of common stock for Dr. Sliman.

The employment agreement with each of Mr. Shallcross and Dr. Sliman that was in effect during 2017 provided that each was eligible for a bonus of up to seventy five percent (75%) of his base salary (a "Target Bonus") in cash or equity and each of Mr. Shallcross and Dr. Sliman received cash bonuses with a value equal to approximately seventy five percent (75%) of their Target Bonus. The bonuses are to be rewarded based on whether, in the discretion of the Compensation Committee and the Board of Directors, our company and the Named Executive Officer met certain objectives established by the Compensation Committee or the Board of Directors. The Compensation Committee believes that the granting of a bonus is appropriate to motivate the Named Executive Officers. The Compensation Committee focuses on individual performance, which enables the Compensation Committee to differentiate among executives and emphasize the link between personal performance and compensation. Although the Compensation

Committee does not use any fixed formula in determining bonuses, it does link them to financial objectives of importance to it. The following factors, in addition, to the market data from the peer group, were among those reviewed in determining the bonus for Mr. Shallcross: successful filings of all SEC reports in a timely manner; execution of the Series A Preferred Stock financing in September 2017; and successful management of our cash position during a challenging environment. The following factors, in addition, to the market data from the peer group, were among those reviewed in determining the bonus for Dr. Sliman: advancement of the clinical development program (reporting positive topline data from the SYN-004 Phase 2 clinical trial, confirmation of key elements of the planned Phase 2b/3 clinical trial for SYN-010) and expansion of existing preclinical programs. Actual levels of achievement were not assigned to any one factor and the performance objectives were looked at in totality. Mr. Riley, who left the Company on December 4, 2017, received a \$200,000 cash bonus for 2017 in connection with his separation from the Company.

### 3. Long-Term Incentives

The Compensation Committee believes that a substantial portion of the Named Executive Officer's compensation should be awarded in equity-based compensation since equity-based compensation is directly linked to the interests of stockholders. The Compensation Committee has elected to grant stock options to the Named Executive Officers and other key employees as the primary long-term incentive vehicle. In making this determination, the Compensation Committee considered a number of factors including: the accounting impact, potential value of stock option grants versus other equity instruments and cash incentives, and the alignment of equity participants with stockholders. The Compensation Committee determined to grant stock options to:

- enhance the link between the creation of stockholder value and executive compensation;
- provide an opportunity for equity ownership;
- act as a retention tool; and
- provide competitive levels of total compensation.

Mr. Shallcross and Dr. Sliman were granted options exercisable for 900,000 and 350,000 (25,714 and 10,000 post Reverse Stock Split) shares of common stock, respectively, upon hire. Mr. Shallcross' bonus for the years ended December 31, 2015 and 2016 included a grant of options exercisable for 100,000 and 500,000 (2,857 and 14,285 post Reverse Stock Split) shares of common stock, respectively. Dr. Sliman's bonus for the years ended December 31, 2014, 2015 and 2016 included a grant of options exercisable for 30,000, 275,000 and 327,800 (857, 7,857 and 9,365 post Reverse Stock Split) shares of common stock, respectively. Dr. Sliman received a grant of options exercisable for 188,927 (5,398 post Reverse Stock Split) when he was appointed Chief Medical Officer. In addition, Mr. Shallcross' and Dr. Sliman's 2017 bonus included a grant of options exercisable for 550,000 and 410,000 (15,714 and 11,714 post Reverse Stock Split) shares of common stock, respectively. The stock options granted vest in equal monthly installments over a three-year term and are subject to the recipient's continued employment, therefore acting as a significant retention incentive. Although Mr. Riley was not eligible for a long-term incentive award in 2017; he did receive the right to exercise vested stock options for one (1) year following December 5, 2017 and other benefits described under "— Employment Agreements and Separation Agreement — Jeffrey Riley, Former Chief Executive Officer and President."

The Compensation Committee reviews the performance, potential burn rates and dilution levels to create an option pool that may be awarded to employee participants. Grants to the Named Executive Officers were determined by the Compensation Committee after reviewing market data, including the reports and analysis discussed above and after considering each executive's performance, role and responsibilities.

The Compensation Committee does not seek to time equity grants to take advantage of information, either positive or negative, about our company that has not been publicly disclosed. Option grants are effective on the date the award determination is made by the Compensation Committee and the exercise price of options is the closing market price of our common stock on the business day of the grant or, if the grant is made on a weekend or holiday, on the prior business day.

#### **4. Benefits**

Named Executive Officers are eligible to participate in our standard medical, dental, vision, disability insurance, life insurance plans and other health and welfare plans provided to other full-time employees.

Each of our Named Executive Officers are entitled to participate in our 401(k) contributory defined contribution plan.

##### *Pension Benefits*

We do not currently provide pension arrangements or post-retirement health coverage for our employees, although we may consider such benefits in the future.

##### *Retirement Benefits*

Each of our Named Executive Officers are eligible to participate in our 401(k) contributory defined contribution plan. Pursuant to our 401(k) plan, all eligible employees, including our Named Executive Officers, are provided with a means of saving for their retirement. We currently match all participating employee contributions up to maximum of 4 percent of compensation which vest immediately.

##### *Nonqualified Deferred Compensation*

We do not provide any nonqualified deferred compensation plans to our employees, although we may consider such benefits in the future.

#### **Conclusion**

Attracting and retaining talented and motivated management and key employees is essential to creating long-term stockholder value. Offering a competitive, performance-based compensation program with a substantial equity component helps to achieve this objective by aligning the interests of the executive officers and other key employees with those of stockholders. We believe that our compensation program met these objectives and that our 2017 compensation program was appropriate in light of the challenges we and our employees face.

#### **Risk Analysis of Our Compensation Program**

Our Compensation Committee has reviewed our compensation policies as generally applicable to our employees and believes that our policies do not encourage excessive or inappropriate risk taking and that the level of risk that they do encourage is not reasonably likely to have a material adverse effect on us. As part of its assessment, the Compensation Committee considered, among other factors, the allocation of compensation among base salary and short- and long-term compensation, our approach to establishing company-wide and individual financial, operational and other performance goals.

**REPORT OF THE COMPENSATION COMMITTEE OF THE BOARD OF DIRECTORS**

The Compensation Committee has reviewed and discussed with management the Compensation Discussion and Analysis for 2017. Based on the review and the discussions, the Compensation Committee recommended to the Board of Directors (and the Board of Directors approved), that the Compensation Discussion and Analysis be included in our Annual Report on Form 10-K for the year ended December 31, 2017 and this proxy statement.

This report is submitted by the Compensation Committee.

Jeffrey Kraws (Chairman)  
Scott L. Tarriff  
Jeffrey Wolf

### INFORMATION CONCERNING EXECUTIVE OFFICERS WHO ARE NOT DIRECTORS

Background information about other executive officers who are not nominees for election as a director is set forth below.

**Steven A. Shallcross.** Mr. Shallcross, age 56, currently serves as the Company's Interim Chief Executive Officer, Chief Financial Officer, Treasurer and Secretary. Mr. Shallcross was appointed as the Company's Interim Chief Executive Officer on December 5, 2017 and has served as the Company's Chief Financial Officer, Treasurer and Secretary since joining the Company in June 2015. Mr. Shallcross brings to the Company operational, financial and international biotech industry experience, as well as an established track record at leading the financial development and strategy for several publicly traded biotech companies. From May 2013 through May 2015, Mr. Shallcross served as Executive Vice President and Chief Financial Officer of Nuo Therapeutics, Inc. (formerly Cytomedix, Inc.). In January 2016, Nuo Therapeutics, Inc. filed a voluntary petition for relief under Chapter 11 of the U.S. Bankruptcy Code in the United States Bankruptcy Court for the District of Delaware and on April 25, 2016, the Bankruptcy Court entered an order granting approval of Nuo's plan of reorganization. From July 2012 to May 2013, Mr. Shallcross held the offices of Executive Vice President, Chief Financial Officer and Treasurer of Empire Petroleum Partners, LLC, a motor fuel distribution company. From July 2011 to March 2012, Mr. Shallcross was Acting Chief Financial Officer of Senseonics, a privately-held medical device company located in Germantown, MD. From January 2009 to March 2011, he served as Executive Vice President and Chief Financial Officer of Innocoll AG (formerly privately held Innocoll Holdings, Inc.), a global, commercial-stage biopharmaceutical company specializing in the development and commercialization of collagen-based products. He also served for four years as the Chief Financial Officer and Treasurer of Vanda Pharmaceuticals, Inc., leading the company through its successful IPO and follow-on offering and previously served as the Senior Vice President and Chief Financial Officer of Middlebrook Pharmaceuticals, Inc. (formerly Advancis Pharmaceutical Corporation). In addition, Mr. Shallcross also served as the Chief Financial Officer of Bering Truck Corporation. He holds an MBA from the University of Chicago's Booth School of Business, a Bachelor of Science degree in Accounting from the University of Illinois, Chicago, and is a Certified Public Accountant in the State of Illinois.

**Joseph A. Sliman.** Dr. Sliman, age 45, was appointed as the Company's Chief Medical Officer, effective January 17, 2017. From January 13, 2014 until January 17, 2017, Dr. Sliman served as the Company's Senior Vice President-Clinical & Regulatory Affairs. Dr. Sliman has more than 18 years of experience in clinical and public health research, including 10 years directing clinical projects and product development, in therapeutic areas such as infectious diseases and vaccines. From September 2012 until January 2014, Dr. Sliman served as Senior Medical Director and Head of Patient Safety and Pharmacovigilance at Vanda Pharmaceuticals Inc., where he directed efforts for a New Drug Application for HETLIOZ (tasimelteon), which is indicated for the treatment of Non-24 Hour Disorder in totally blind adults. From December 2008 until August 2012, Dr. Sliman served as Medical Director in Vaccines and Infectious Diseases at MedImmune, Inc., where he was a member of successful Biologics Licensure Application teams. Prior to joining MedImmune, Inc., he served as Associate Medical Director at Dynport Vaccine Company, where he was the clinical director for seasonal and pandemic influenza vaccine trials as well as its Defense Vaccines development program (partnered with Department of Defense Joint Vaccines Acquisition Program). During his service in the United States Navy, Dr. Sliman led the U.S. Pacific Fleet disease surveillance programs, including influenza surveillance, preparedness, and prevention, as well as communicable disease and injury surveillance and prevention and health policy development. Dr. Sliman earned an M.D. from the Uniformed Services University, a Master's Degree in Public Health from the Johns Hopkins University School of Public Health, and a B.S. in Molecular and Cell Biology, with Honors in Biology, from Pennsylvania State University.

## EXECUTIVE COMPENSATION

## Summary Compensation Table

The following table summarizes all compensation awarded to, earned by or paid to Steven A. Shallcross, Joseph Sliman and Jeffrey Riley, our Named Executive Officers, during the fiscal years presented below.

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Options Awards (\$) <sup>(1)</sup>	All Other Compensation (\$) <sup>(2)</sup>	Total (\$)
Steven Shallcross <sup>(3)</sup>	2017	\$346,500	\$200,000 <sup>(4)</sup>	\$ 177,746	\$ 74,644	\$ 798,890
Interim Chief Executive Officer and Chief Financial Officer	2016	\$315,000	\$236,250	\$ 320,003	\$ 49,929	\$ 921,182
	2015	\$183,750	\$137,813	\$2,119,855	\$ 11,657	\$2,453,075
Joseph Sliman <sup>(5)</sup>	2017	\$385,000	\$216,563 <sup>(4)</sup>	\$ 236,305	\$ 48,613	\$ 886,481
Chief Medical Officer	2016	—	—	—	—	—
	2015	—	—	—	—	—
Jeffrey Riley <sup>(6)</sup>	2017	\$508,333	\$200,000 <sup>(4)</sup>	\$ —	\$ 677,891	\$1,386,224
Former President and Chief Executive Officer	2016	\$550,000	\$412,500	\$ 722,560	\$ 66,703	\$1,751,763
	2015	\$396,875	\$288,750	\$1,767,490	\$ 97,986	\$2,551,101

- (1) Amount reflects the grant date fair value of the Named Executive Officer's stock options, calculated in accordance with FASB ASC Topic 718. For a discussion of the assumptions used in calculating these values, see Note 5 of the notes to Consolidated Financial Statements in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. In December 2017 Mr. Shallcross was issued an option to purchase 550,000 (15,714 post Reverse Stock Split) shares of common stock and Dr. Sliman was issued an option to purchase 410,000 (11,714 post Reverse Stock Split) shares of common stock; both awards vest monthly over 36 months. In January 2017 Dr. Sliman was issued an option to purchase 188,927 shares of common stock vesting over 36 months.
- (2) The all other compensation column is comprised of vacation accrual paid, and the portion of medical, dental and vision premiums paid by us on behalf of our Named Executive Officers. These benefits are offered to all of our employees who work at least 17.5 hours per week. Mr. Riley's other compensation includes severance of \$550,000.
- (3) Mr. Shallcross was appointed as our Interim Chief Executive Officer on December 5, 2017. Mr. Shallcross' annual salary was \$346,500 commencing December 1, 2016 until December 2017 when it was increased to \$381,150. For serving as Interim Chief Executive Officer, Mr. Shallcross receives an additional \$8,000 per month for each month that he serves in such position.
- (4) These bonuses were earned in 2017 and paid in 2018.
- (5) Dr. Sliman was appointed our Chief Medical Officer effective January 17, 2017.
- (6) Mr. Riley resigned as our Chief Executive officer on December 4, 2017.

## Pay Ratio Disclosure

In August 2015 pursuant to a mandate of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd — Frank Act"), the SEC adopted a rule requiring annual disclosure of the ratio of the median employee's annual total compensation to the total annual compensation of the Chief Executive Officer. Our former Chief Executive Officer is Mr. Riley and our Interim Chief Executive Officer is Mr. Shallcross. The purpose of the new required disclosure is to provide a measure of the equitability of pay within the organization. We believe our compensation philosophy and process yield an equitable result and is presenting such information in advance of the required disclosure date as follows:

Median Employee total annual compensation	\$175,000
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Mr. Riley (“CEO”) total annual compensation	\$614,000
Ratio of CEO to Median Employee Compensation	3.51:1.0

In determining the median employee, a listing was prepared of all employees as of December 31, 2017. Employees on leave of absence were excluded from the list and wages and salaries were annualized for those employees that were not employed for the full year of 2017. The median amount was selected from the annualized list. For simplicity, the value of our 401(k) plan and medical benefits provided was excluded as all employees including the Named Executive Officers are offered the exact same benefits and we utilize the Internal Revenue Service safe harbor provision for 401(k) discrimination testing. As of December 31, 2017, we employed 27 persons.

#### Outstanding Equity Awards at Fiscal Year End

The table below reflects all outstanding equity awards made to each of the Named Executive Officers that are outstanding at December 31, 2017, as adjusted for the Reverse Stock Split. We currently grant stock-based awards pursuant to our 2010 Stock Incentive Plan (the “2010 Stock Plan”) and have outstanding awards under our 2001 Stock Incentive Plan (the “2001 Stock Plan”) and 2007 Stock Incentive Plan (the “2007 Stock Plan”).

Name	Grant Date <sup>(1)</sup>	Number of Securities Underlying Unexercised Options Exercisable	Number of Securities Underlying Unexercised Options Unexercisable	Option Exercise Price (\$)	Option Expiration Date
Steven Shallcross	12/20/17	—	15,714	\$ 18.20	12/20/24
	11/30/16	5,159	9,127	\$ 28.00	11/30/23
	12/04/15	1,905	952	\$ 96.60	12/04/22
	06/01/15	21,429	4,286	\$ 75.60	06/01/25
Joseph Sliman	12/20/17	—	11,714	\$ 18.20	12/20/24
	01/17/17	1,649	3,748	\$ 29.05	01/17/24
	11/30/16	3,382	5,984	\$ 28.00	11/30/23
	12/04/15	5,238	2,619	\$ 96.60	12/03/22
	12/31/14	857	—	\$ 51.10	12/31/24
	02/24/14	10,000	—	\$ 95.55	02/23/19
Jeffrey Riley	11/30/16	10,752	—	\$ 28.00	12/04/18
	12/04/15	9,524	—	\$ 96.90	12/04/18
	01/08/15	9,167	—	\$ 53.90	12/04/18
	04/17/14	14,286	—	\$ 88.20	12/04/18
	02/03/12	21,429	—	\$ 80.50	12/04/18
	11/17/11	2,857	—	\$ 17.15	11/17/18
	01/05/11	714	—	\$ 52.50	01/05/18
	12/01/10	238	—	\$ 25.90	12/04/18
	03/03/10	714	—	\$ 30.45	12/04/18

(1) Shallcross and Sliman Options will vest pro rata, on a monthly basis, over 36 months.

### Grants of Plan-Based Awards for Fiscal 2017

The following table sets forth information regarding grants of compensation in the form of plan-based awards made during 2017 to our Named Executive Officers, as adjusted for the Reverse Stock Split. The equity awards granted in 2017 identified in the table below are also reported in the table above entitled “Outstanding Equity Awards at Fiscal Year End”:

Name	Grant Date	All Other Stock Awards: Number of Shares of Stock or Units (#)	All Other Stock Awards: Number of Securities Underlying Options <sup>(1)</sup>	Exercise or Base Price of Option Awards (\$/Sh)	Grant Date Fair Value of Stock and Option Awards <sup>(2)</sup>
Steven Shallcross	12/20/17	—	15,714	\$ 18.20	\$ 177,000
Joseph Sliman	01/17/17	—	5,398	\$ 29.05	\$ 104,000
	12/20/17	—	11,714	\$ 18.20	\$ 132,000

- (1) Each stock option was granted with an exercise price equal to the fair market value of our common stock on the grant date.
- (2) Amount reflects the grant date fair value of the Named Executive Officer’s stock options, calculated in accordance with FASB ASC Topic 718. For a discussion of the assumptions used in calculating these values, see Note 5 to our consolidated financial statements. In December 2017, Mr. Shallcross was issued an option to purchase 550,000 (15,714 post Reverse Stock Split) shares of common stock and Dr. Sliman was issued an option to purchase 410,000 (11,714 post Reverse Stock Split) shares of common stock; both awards vest monthly over 36 months. In January 2017, Dr. Sliman was issued an option to purchase 188,927 (5,398 post Reverse Stock Split) shares of common stock vesting over 36 months.

### Option Exercises and Stock Vested in 2017

There were no options exercised by the Named Executive Officers in 2017. There were no stock awards held by our Named Executive Officers that vested in 2017.

### Employment Agreements and Separation Agreement

*Steven A. Shallcross, Interim Chief Executive, Officer, Chief Financial Officer, Treasurer and Secretary*

On April 28, 2015, we entered into a two-year employment agreement with Steven A. Shallcross (the “Shallcross Employment Agreement”), who was appointed to serve as our Chief Financial Officer, Treasurer and Secretary, effective June 1, 2015. Pursuant to the Shallcross Employment agreement, Mr. Shallcross was initially entitled to an annual base salary of \$315,000. Additionally, Mr. Shallcross was granted options to purchase 900,000 (25,714 post Reverse Stock Split) shares of our common stock with an exercise price equal to the per share market price on the date of issue. These options vest pro rata, on a monthly basis, over 36 months. In 2015 and for each full calendar year thereafter, Mr. Shallcross is eligible for an annual performance bonus of up to seventy-five percent (75%) of his base salary. The annual bonus is to be based upon the Board’s assessment of Mr. Shallcross’ performance. Mr. Shallcross also signed a standard agreement that includes confidentiality obligations and inventions assignments by Mr. Shallcross and non-solicitation and non-competition provisions.

Effective November 30, 2016, we entered into an amendment to the Shallcross Employment Agreement, dated April 28, 2015, to increase Mr. Shallcross’ annual base salary to \$346,500. We entered into another amendment to the Shallcross Employment Agreement, dated as of May 31, 2017, to, among other things, extend the term of the agreement two years, or until May 30, 2019 (unless earlier terminated pursuant to the terms of the agreement).



On December 5, 2017, Mr. Shallcross was appointed as our Interim Chief Executive Officer. Effective December 20, 2017, we entered into an amendment to the Shallcross Employment Agreement dated April 28, 2015, as amended on December 1, 2016 and May 31, 2017, to increase Mr. Shallcross' annual base salary to \$381,150 and for the period that Mr. Shallcross serves as Interim Chief Executive Officer, he is entitled to receive a cash payment of \$8,000 per calendar month; pro-rated for any partial months that Mr. Shallcross serves as Interim Chief Executive Officer, payable in accordance with our regular payroll practices.

*Dr. Joseph Sliman, Chief Medical Officer*

On January 17, 2017, we entered into a two-year employment agreement with Dr. Joseph Sliman (the "Sliman Employment Agreement"), who was promoted from the position of Senior Vice President — Clinical & Regulatory Affairs to the position of Chief Medical Officer. Pursuant to the terms of the Sliman Employment Agreement, Dr. Sliman will receive an annual base salary of \$385,000. In connection with his appointment, Dr. Sliman was granted options exercisable for 188,927 shares of common stock upon his appointment as Chief Medical Officer.

Pursuant to the terms of the Sliman Employment Agreement, Dr. Sliman is entitled to an annual base salary of \$385,000 and an annual performance bonus of up to seventy five percent (75%) of his annual base salary. The annual bonus will be based upon the assessment of the Board of Dr. Sliman's performance. Dr. Sliman was also granted a seven year incentive stock option to purchase at an exercise price of \$0.83 (29.05 post Reverse Stock Split) per share one hundred and eighty-eight thousand nine hundred and twenty-seven (188,927) (5,398 post Reverse Stock Split) shares of our common stock, vesting pro rata on a monthly basis over a three year period. Dr. Sliman also signed a standard agreement that also includes confidentiality obligations and inventions assignments by Dr. Sliman and non-solicitation and non-competition provisions.

The Shallcross Employment Agreement and the Sliman Employment Agreement each have a stated term of two years but may be terminated earlier pursuant to their terms. If either Mr. Shallcross' or Dr. Sliman's (each an "Executive") employment is terminated for any reason, he or his estate as the case may be, will be entitled to receive the accrued base salary, vacation pay, expense reimbursement and any other entitlements accrued by him to the extent not previously paid (the "Accrued Obligations"); provided, however, that if his employment is terminated (1) by us without Cause or by the Executive for Good Reason (as each is defined below) then in addition to paying the Accrued Obligations, (x) we will continue to pay his then current base salary and continue to provide benefits at least equal to those which were provided at the time of termination for a period of 12 months and (y) he shall have the right to exercise any vested equity awards until the earlier of six months after termination or the remaining term of the awards, or (2) by reason of his death or Disability (as defined in each of the Shallcross Employment Agreement and the Sliman Employment Agreement), then in addition to paying the Accrued Obligations, he would have the right to exercise any vested options until the earlier of six months after termination or the remaining term of the awards. In such event, if the Executive commenced employment with another employer and becomes eligible to receive medical or other welfare benefits under another employer-provided plan, the medical and other welfare benefits to be provided by us as described herein will terminate.

The Shallcross Employment Agreement and Sliman Employment Agreement each provide that upon the closing of a "Change in Control" (as defined below), the time period that the Executive will have to exercise all vested stock options and other awards that the Executive may have will be equal to the shorter of: (i) six (6) months after termination, or (ii) the remaining term of the award(s). Upon the closing of a Change in Control, all of Mr. Shallcross' and Dr. Sliman's unvested options immediately vest. If within one year after the occurrence of a Change in Control, the Executive terminates his employment for "Good Reason" or the Company terminates the Executive's employment for any reason other than death, Disability or Cause, the Executive will be entitled to receive: (i) the portion of his base salary for periods prior to the effective date of termination accrued but unpaid (if any); (ii) all unreimbursed expenses (if any); (iii) an aggregate amount (the "Change in Control Severance Amount") equal to two times the sum of the base salary plus an amount equal to the bonus that would be payable if the "target" level performance were achieved under the Company's annual bonus plan (if any) in respect of the fiscal year during which the termination occurs (or the prior fiscal year if bonus levels have not yet been established for the year of

termination); and (iv) the payment or provision of any other benefits. The Change in Control Severance Amount is to be paid in a lump sum, if the Change in Control event constitutes a “change in the ownership” or a “change in the effective control” of us or a “change in the ownership of a substantial portion of a corporation’s assets” (each within the meaning of Section 409A of the Internal Revenue Code), or in 48 substantially equal payments, if the Change in Control event does not so comply with Section 409A. Upon the termination of employment for Good Reason by the Executive or upon the involuntary termination of employment of Executive for any reason other than death, Disability or Cause, in either case within two years commencing after the occurrence of a Change in Control, the Executive will be entitled to receive for a period of two years commencing on the date of such termination medical, dental, life and disability coverage for himself and his family members which is not less favorable than the coverage carried by us at the time of termination.

For the purposes of the Shallcross Employment Agreement and the Sliman Employment Agreement “Change in Control” is defined as: (i) any person or entity becoming the beneficial owner, directly or indirectly, of our securities representing fifty percent (50%) of the total voting power of all its then outstanding voting securities; (ii) a merger or consolidation of us in which our voting securities immediately prior to the merger or consolidation do not represent, or are not converted into securities that represent, a majority of the voting power of all voting securities of the surviving entity immediately after the merger or consolidation; or (iii) a sale of substantially all of our assets or our liquidation or dissolution.

For purpose of the Shallcross Employment Agreement and the Sliman Employment Agreement, “Good Reason” is defined as the occurrence of any of the following events without the respective Executive’s consent: (i) a material reduction in the Executive’s base salary (other than an across-the-board decrease in base salary applicable to all of our executive officers); (ii) a material breach of the employment agreement by us; (iii) a material reduction in the Executive’s duties, authority and responsibilities relative to the Executive’s duties, authority, and responsibilities in effect immediately prior to such reduction; or (iv) the relocation of the Executive’s principal place of employment, without the Executive’s consent, in a manner that lengthens his one-way commute distance by 50 or more miles from his then-current principal place of employment immediately prior to such relocation.

For purposes of the Shallcross Employment Agreement and Sliman Employment Agreement, “Cause” is defined as that the Executive shall have engaged in any of the following acts or that any of the following events shall have occurred, all as determined by the Board of Directors in its sole and absolute discretion: (i) gross insubordination, acts of embezzlement or misappropriation of funds, fraud, dereliction of fiduciary obligations; (ii) conviction of a felony or other crime involving moral turpitude, dishonesty or theft (including entry of a *nolo contendere* plea); (iii) willful unauthorized disclosure of confidential information belonging to the us or entrusted to us by a client; (iv) material violation of any provision of the Executive’s employment agreement, of any of our policies, and/or of a confidentiality agreement, which, to the extent it is curable by the Executive, is not cured by the Executive within 30 days of receiving written notice of such violation by us; (v) being under the influence of drugs (other than prescription medicine or other medically related drugs to the extent that they are taken in accordance with their directions) during the performance of the Executive’s duties; (vi) engaging in certain behavior; or (vii) willful failure to perform his written assigned tasks, where such failure is attributable to the fault of the Executive which, to the extent it is curable by the Executive, is not cured by Executive within 30 days of receiving written notice of such violation by us.

*Jeffrey Riley, Former Chief Executive Officer and President*

Effective February 3, 2012, Jeffrey Riley was appointed to serve as our Chief Executive Officer and President. In connection with his appointment, Mr. Riley entered into a three-year employment agreement (the “Original Riley Agreement”). Pursuant to the Original Riley Agreement, Mr. Riley was entitled to an annual base salary of \$348,000 and was eligible for discretionary performance and transactional bonus payments. Additionally, Mr. Riley was granted options to purchase 750,000 (21,429 post Reverse Stock Split) shares of our common stock with an exercise price equal to the per share market price on the date of issue. These options vested pro rata, on a monthly basis, over 36 months. Effective April 17, 2014, the Original Riley Agreement was amended to increase his base salary to \$385,000.

Effective March 18, 2015, we entered into a new two-year employment agreement with Mr. Riley (the “2015 Riley Employment Agreement”). Pursuant to the 2015 Riley Employment Agreement, Mr. Riley’s annual base salary remained at \$385,000 until it was amended effective December 4, 2015 to an annual base salary of \$550,000. Beginning in 2015 and for each full calendar year thereafter, Mr. Riley was eligible for an annual performance bonus of up to seventy-five percent (75%) of his base salary. The annual bonus was to be based upon the Board’s assessment of Mr. Riley’s performance. The 2015 Riley Employment Agreement also included confidentiality obligations, inventions assignments by Mr. Riley as well as change in control, non-solicitation and non-competition provisions.

Effective February 27, 2017, we entered into a new two-year employment agreement with Mr. Riley (the “2017 Employment Agreement”), which replaced the 2015 Riley Employment Agreement that was due to expire on March 17, 2017. Pursuant to the 2017 Riley Employment Agreement, Mr. Riley’s annual base salary remained at \$550,000. Pursuant to the terms of the 2017 Riley Employment Agreement, beginning in 2017 and for each full calendar year thereafter, Mr. Riley was eligible for an annual performance bonus of up to seventy-five percent (75%) of his base salary. The annual bonus was to be based upon the Board’s assessment of Mr. Riley’s performance. Mr. Riley also signed a standard agreement that includes confidentiality obligations, inventions assignments by Mr. Riley, non-solicitation and non-competition provisions.

Effective December 4, 2017, Jeffery Riley resigned his position as President and Chief Executive Officer. Pursuant to his resignation, we entered into a Separation Agreement effective December 4, 2017 (the “Separation Agreement”) with Jeffrey Riley. The Separation Agreement provides that in addition to receiving all accrued obligations, including salary and earned and unused vacation days, Mr. Riley will receive the following separation benefits: (i) twelve months’ payment of Mr. Riley’s current base salary, subject to payroll withholdings and deductions, paid on our regular payroll dates; (ii) a cash bonus for 2017 of \$200,000; and (iii) the right to exercise vested stock options for one (1) year following December 5, 2017. Mr. Riley shall also be entitled to COBRA continuation coverage, and we pay the COBRA premium for Mr. Riley for a maximum period of twelve months after his separation. The Separation Agreement also contains additional provisions that are customary for agreements of this type. These include confidentiality and non-solicitation provisions. All costs associated with the Separation Agreement were recorded during the year ended December 31, 2017.

The following table shows the estimated, incremental amounts that would have been payable to the Named Executive Officers upon the occurrence of the indicated event, had the applicable event occurred on December 31, 2017. These amounts would be incremental to the compensation and benefit entitlements described above that are not contingent upon a termination or change in control. The amounts attributable to the vesting of stock options are based upon the fair market value of our common stock on December 31, 2017, which was \$0.51 per share. The actual compensation and benefits the Named Executive Officer would receive at any subsequent date would likely vary from the amounts set forth below as a result of certain factors, such as a change in the price of our common stock and any additional benefits the Named Executive Officer may have accrued as of that time under the applicable employment agreement.

Name	Event	Salary & Other Continuing Payments (\$)	Extension of Post-Termination Exercise Period (\$) <sup>(4)</sup>	Total (\$)
Steven A. Shallcross	Termination without Cause or resignation for Good Reason	\$ 421,000 <sup>(1)</sup>	\$ —	\$ 421,000
	Upon Death or Disability	\$ —	\$ —	\$ —
	Termination without Cause or resignation for Good Reason following a Change of Control	\$1,264,000 <sup>(2)</sup>	\$ —	\$1,264,000
Joseph Sliman	Termination without Cause or resignation for Good Reason	\$ 434,000 <sup>(1)</sup>	\$ —	\$ 434,000
	Upon Death or Disability	\$ —	\$ —	\$ —
	Termination without Cause or resignation for Good Reason following a Change of Control	\$1,153,000 <sup>(2)</sup>	\$ —	\$1,153,000
	Change of Control	\$ —	\$ —	\$ —
Jeffrey Riley	Termination without Cause or resignation for Good Reason	\$ 878,000 <sup>(3)</sup>	\$ 2,000	\$ 880,000

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- (1) Base salary and COBRA premiums, and, where provided under the applicable employment agreement, pro-rated bonus. Pro-rated bonus amounts assume annual bonus at 100% of target performance (75% of base salary).
- (2) Two times base salary and COBRA premiums, and, where provided under the applicable employment agreement, pro-rated bonus. Pro-rated bonus amounts assume annual bonus at 100% of target performance (75% of base salary).
- (3) Effective December 4, Mr. Riley resigned his positions at the Company. This payment reflects the amounts paid or to be paid to Mr. Riley pursuant to his Severance Agreement.
- (4) Reflects the increase in value of the spread, or in-the-money value, as of the end of the extended exercise period provided under the applicable employment agreement, as compared to the value of the spread at December 31, 2016, of options to purchase our common stock which were vested as of, or which would vest upon the occurrence of, the specified event, where provided under the applicable employment agreement, as assuming that the price of our common stock was the closing price on December 31, 2017, \$0.51 per share. Does not include the value of out-of-the-money options. Please refer to the Outstanding Equity Awards at Fiscal Year End table above for listing of the vested and unvested stock options held by the Named Executive Officers as of December 31, 2017.

### SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information, as of August 3, 2018 and after taking into account the Reverse Stock Split, or as otherwise set forth below, with respect to the beneficial ownership of our common stock (i) all persons known to us to be the beneficial owners of more than 5% of the outstanding shares of our common stock; (ii) each of our directors and our named executive officers named in the Summary Compensation Table; and (iii) all of our directors and our executive officer as a group.

Name and Address of Beneficial Ownership <sup>(2)</sup>	Shares Owned <sup>(1)</sup>	
	Number of Share Owned	Percentages of Shares <sup>(3)</sup>
Randal J. Kirk and affiliated entities <sup>(4)</sup>	378,236	9.96%
Intrexon <sup>(4)</sup>	274,664	7.22%
Jeffrey J. Kraws <sup>(5)</sup>	14,063	*
Jeff Riley (Former Chief Executive Officer) <sup>(6)</sup>	69,263	1.8%
Steven Shallcross <sup>(7)</sup>	31,349	*
Joeseeph Sliman <sup>(8)</sup>	22,773	*
Scott L. Tarriff <sup>(9)</sup>	37,634	*
Jeffrey Wolf <sup>(10)</sup>	11,920	*
All officers and directors as a group (6 persons)	187,005	4.7%

\* represents less than 1% of our common stock

- (1) The address for each beneficial owner except Intrexon and Randal J. Kirk is 9605 Medical Center, Suite 270, Rockville, Maryland 20850. The address for Intrexon is 20358 Seneca Meadows Pkwy, Germantown, Maryland 20876. The address for Mr. Kirk is The Governor Tyler, 1881 Grove Avenue, Radford, Virginia 24141.
- (2) Beneficial ownership is determined in accordance with SEC rules and generally includes voting or investment power with respect to securities. Except as indicated in the footnotes to the table, to the knowledge of the Company, the persons named in the table have sole voting and investment power with respect to all shares of common stock, options and/or warrants shown as beneficially owned by them, subject to community property laws, where applicable. Pursuant to the rules of the SEC, the number of shares of our common stock deemed outstanding includes shares issuable pursuant to options held by the respective person or group that are currently exercisable or may be exercised within 60 days of August 3, 2018.
- (3) Based on 3,799,136 shares of common stock outstanding after taking into account the Reverse Stock Split.
- (4) Share ownership information is based on information contained in a Schedule 13D/A filed with the SEC on September 2, 2015 by Randal J. Kirk, Third Security, LLC., NRM VII Holdings I, LLC, and Intrexon. Intrexon owns 9,613,268 (274,665 post Reverse Stock Split) shares of common stock and NRM VII Holdings I, LLC owns 3,625,000 (103,571 post Reverse Stock Split) shares of Common Stock. NRM VII Holdings I, LLC is managed by an affiliate that is managed by Third Security, LLC and Third Security, LLC is managed by Mr. Kirk. Mr. Kirk could be deemed to have indirect beneficial ownership of the shares of common stock directly owned by Intrexon and NRM VII Holdings I, LLC.
- (5) Includes 492,217 (14,063 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Kraws that are exercisable within the 60-day period following August 3, 2018. Does not include an additional 256,532 (7,329 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Kraws that are not exercisable within the 60-day period following August 3, 2018.
- (6) Includes 2,413,832 (68,966 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Riley that are exercisable within the 60-day period following August 3, 2018.

- (7) Includes 1,211,110 (34,603 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Shallcross that are exercisable within the 60-day period following August 3, 2018. Does not include an additional 838,890 (23,968 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Shallcross that are not exercisable within the 60-day period following August [ ], 2018.
- (8) Includes 863,850 (24,681 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Sliman that are exercisable within the 60-day period following August [ ], 2018. Does not include an additional 717,877 (20,510 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Shallcross that are not exercisable within the 60-day period following August [ ], 2018.
- (9) Includes (i) 300,000 (8,571 post Reverse Stock Split) shares purchased from us in our November 2016 offering, (ii) 417,218 (11,920 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Tarriff that are exercisable within the 60-day period following August [ ], 2018, and (iii) warrants to purchase 600,000 (17,142 post Reverse Stock Split) shares of our common stock, which warrants were acquired in our November 2016 offering. Does not include an additional 256,532 (7,329 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Tarriff that are not exercisable within the 60-day period following August [ ], 2018.
- (10) Includes 417,217 (7,329 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Wolf that are exercisable within the 60-day period following August [ ], 2018. Does not include an additional 256,532 (7,329 post Reverse Stock Split) shares issuable upon exercise of options held by Mr. Wolf that are not exercisable within the 60-day period following August [ ], 2018.

#### Equity Compensation Plan Information

The following table sets forth information about the securities authorized for issuance under our equity compensation plans for the fiscal year ended December 31, 2017 as adjusted for the Reverse Stock Split.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options	Weighted-Average Exercise Price of Outstanding Options	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans
Equity compensation plans approved by stockholders:			
2007 Stock Incentive Plan	20,350	\$ 59.15	—
2010 Stock Incentive Plan	327,322	\$ 54.25	5,578,024
Equity compensation plans not approved by stockholders	—	N/A	N/A
<b>Total</b>	<b>347,672</b>	<b>\$ 54.25</b>	<b>5,578,024</b>

#### CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

Pursuant to our Audit Committee Charter, our Audit Committee reviews on an on-going basis for potential conflicts of interest, and approves, if appropriate, all our “Related Party Transactions” as required by Section 120 of the NYSE American Company Guide. For purposes of our Audit Committee Charter, “Related Party Transactions” means those transactions required to be disclosed pursuant to SEC Regulation S-K, Item 404. Transactions involving compensation for services provided to us as an employee, consultant or director are not considered related-person transactions under this policy. A related person is defined as any executive officer, director or a holder of more than 5% of our common stock, including any of their immediate family members and any entity owned or controlled by such persons.

Except as disclosed under Compensation Discussion and Analysis and Director Compensation, there have been no reportable “Related Party Transactions” since January 1, 2017.

The Board of Directors has determined that Mr. Kraws, Mr. Tarriff and Mr. Wolf are independent directors.

### AVAILABILITY OF REPORT ON FORM 10-K

Our audited consolidated financial statements are included in our Annual Report on Form 10-K for the year ended December 31, 2017 filed with the SEC at the Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Upon your written request, we will provide to you a complimentary copy of our 2017 Annual Report on Form 10-K as filed with the SEC. Your request should be mailed to the Corporate Secretary, Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850. A complimentary copy may also be obtained at the internet website maintained by the SEC at [www.sec.gov](http://www.sec.gov), and by visiting our website at [www.syntheticbiologics.com](http://www.syntheticbiologics.com) and clicking on “Investors,” then on “Annual Meeting Materials.”

### NOTICE REGARDING DELIVERY OF STOCKHOLDER DOCUMENTS (“HOUSEHOLDING” INFORMATION)

The SEC has adopted rules that permit companies and intermediaries (e.g., brokers) to satisfy the delivery requirements for proxy statements or other annual meeting materials with respect to two or more stockholders sharing the same address by delivering a single proxy statement or other annual meeting materials addressed to those stockholders. This process, which is commonly referred to as “householding,” potentially means extra convenience for stockholders and cost savings for companies and intermediaries. A number of brokers and other intermediaries with account holders who are our stockholders may be householding our proxy materials, including this Proxy Statement. In that event, a single proxy statement will be delivered to multiple stockholders sharing an address unless contrary instructions have been received from the affected stockholders. Once you have received notice from your broker or other intermediary that it will be householding communications to your address, householding will continue until you are notified otherwise or until you revoke your consent, which is deemed to be given unless you inform the broker or other intermediary otherwise when you receive or received the original notice of householding. If, at any time, you no longer wish to participate in householding and would prefer to receive a separate proxy statement and other annual meeting materials, please notify your broker or other intermediary to discontinue householding and direct your written request to receive a separate proxy statement and other annual meeting materials to the Corporate Secretary, Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850 or by calling us at (301) 417-4364. Stockholders who currently receive multiple copies of the Proxy Statement at their addresses and would like to request householding of their communications should contact their broker or other intermediary.

### STOCKHOLDER PROPOSALS FOR THE 2019 ANNUAL MEETING

Stockholder proposals which are intended to be presented at the 2019 Annual Meeting of Stockholders pursuant to SEC Rule 14a-8 must be received by the Company by April 1, 2019.

A stockholder who intends to present business, including the nomination of a director, at the 2019 Annual Meeting of Stockholders other than pursuant to Rule 14a-8, must currently comply with the requirements set forth in our Nominations Committee’s charter. Stockholders should consult our Nominations Committee’s charter to ensure that all of the specific requirements of such notice are met.

### AVAILABLE INFORMATION ON CORPORATE GOVERNANCE AND SEC FILINGS

Through our website ([www.syntheticbiologics.com](http://www.syntheticbiologics.com)), we make available, free of charge, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, all amendments to those reports, and other filings with the SEC, as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. We also make the following documents available on our website: the Audit Committee Charter; the Compensation Committee Charter; the Nominations Committee Charter; our Code of Conduct; and our Code of Ethics for Financial Management. You may also obtain a copy of any of the foregoing documents, free of charge, if you submit a written request to the Corporate Secretary, Synthetic Biologics, Inc., 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850.

No person is authorized to give any information or make any representation other than that contained in this Proxy Statement, and if given or made, such information may not be relied upon as having been authorized.

**MISCELLANEOUS**

Our Board of Directors knows of no other business to be presented at the 2018 Annual Meeting. If, however, other matters properly do come before the 2018 Annual Meeting, it is intended that the proxies in the accompanying form will be voted thereon in accordance with the judgment of the person or persons holding such proxies.

**YOU ARE URGED TO CAST YOUR VOTE AS INDICATED IN THE PROXY MATERIALS. PROMPT RESPONSE WILL GREATLY FACILITATE ARRANGEMENTS FOR THE 2018 ANNUAL MEETING, AND YOUR COOPERATION WILL BE APPRECIATED.**

/s/ Steven A. Shallcross

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Interim Chief Executive Officer and  
Chief Financial Officer and Secretary



**CERTIFICATE OF AMENDMENT TO  
ARTICLES OF INCORPORATION OF  
SYNTHETIC BIOLOGICS, INC.**

If the amendment to our Articles of Incorporation to decrease the number of authorized shares of common stock, \$.001 par value per share, from 10,000,000 shares to 200,000,000 shares is approved by stockholders, the amendment will be effective when the certificate of amendment to the Articles of Incorporation is filed with the Secretary of State of the State of Nevada.

If the amendment to increase the number of authorized shares of common stock is approved by stockholders, the first paragraph of Article 3 of our Articles of Incorporation will be amended to read as follows:

**ARTICLE 3.**

The first paragraph of Article 3 shall be amended as follows:

The total number of shares of all classes of stock that the Corporation shall have authority to issue is Two Hundred Ten Million (210,000,000) shares consisting of: Two Hundred Million (200,000,000) shares of common stock, \$.001 par value per share (“Common Stock”); and Ten Million (10,000,000) shares of preferred stock, \$.001 par value per share (“Preferred Stock”).

The remaining provisions of Article 3 shall remain the same.

**SYNTHETIC BIOLOGICS, INC.**  
**(FORMERLY KNOWN AS ADEONA PHARMACEUTICALS, INC.)**  
**2010 STOCK INCENTIVE PLAN**  
**(as amended on August 1, 2018)**

**ARTICLE I**  
**GENERAL**

**1.1 Purpose**

The purpose of the Synthetic Biologics, Inc. (formerly known as Adeona Pharmaceuticals, Inc.) 2010 Stock Incentive Plan (the “Plan”) is to provide an incentive for the employees, directors, and consultants to Synthetic Biologics, Inc. (formerly known as Adeona Pharmaceuticals, Inc.) (the “Company”) and its subsidiaries an incentive (a) to enter into and remain in the service of the Company; (b) to enhance the long-term performance of the Company; and (c) to acquire a proprietary interest in the success of the Company.

**1.2 Administration**

1.2.1 The Plan shall be administered by the Compensation Committee (the “Committee”) of the board of directors of the Company (the “Board”), which shall consist of not less than two directors. The members of the Committee shall be appointed by, and serve at the pleasure of, the Board. To the extent required for transactions under the Plan to qualify for the exemptions available under Rule 16b-3 (“Rule 16b-3”) promulgated under the Securities Exchange Act of 1934 (the “1934 Act”), all actions relating to awards to persons subject to Section 16 of the 1934 Act shall be taken by the Board unless each person who serves on the Committee is a “non-employee director” within the meaning of Rule 16b-3 or such actions are taken by a sub-committee of the Committee (or the Board) comprised solely of “non-employee directors”. To the extent required for compensation realized from awards under the Plan to be deductible by the Company pursuant to Section 162(m) of the Internal Revenue Code of 1986, as amended (the “Code”), if Section 162(m) of the Code is applicable, the members of the Committee shall be “outside directors” within the meaning of Section 162(m).

1.2.2 The Committee shall have the authority (a) to exercise all of the powers granted to it under the Plan; (b) to construe, interpret and implement the Plan and any Plan Agreements executed pursuant to Section 2.1; (c) to prescribe, amend and rescind rules and regulations relating to the Plan, including rules governing its own operations; (d) to make all determinations necessary or advisable in administering the Plan; (e) to correct any defect, supply any omission and reconcile any inconsistency in the Plan; (f) to amend the Plan to reflect changes in applicable law; (g) to determine whether, to what extent and under what circumstances awards may be settled or exercised in cash, shares of the Company’s common stock, par value \$.001 (the “Common Stock”), other securities, other awards or other property, or canceled, forfeited or suspended and the method or methods by which awards may be settled, canceled, forfeited or suspended; and (h) to determine whether, to what extent and under what circumstances cash, shares of the Common Stock, other securities, other awards or other property and other amounts payable with respect to an award shall be deferred either automatically or at the election of the holder thereof or of the Committee.

1.2.3 Actions of the Committee shall be taken by the vote of a majority of its members. Any action may be taken by a written instrument signed by a majority of the Committee members, and action so taken shall be fully as effective as if it had been taken by a vote at a meeting.

1.2.4 The determination of the Committee on all matters relating to the Plan or any Plan Agreement shall be final, binding and conclusive.

1.2.5 No member of the Committee shall be liable for any action or determination made in good faith with respect to the Plan or any award thereunder.

1.2.6 Notwithstanding anything to the contrary contained herein: (a) until the Board shall appoint the members of the Committee, the Plan shall be administered by the Board; and (b) the Board may, in its sole discretion, at any time and from time to time, grant awards or resolve to administer the Plan. In either of the foregoing events, the Board shall have all of the authority and responsibility granted to the Committee herein.

**1.3 Persons Eligible for Awards**

Awards under the Plan may be made to such directors, officers and other employees of the Company and its subsidiaries (including prospective employees conditioned on their becoming employees), and to such consultants to the Company and its subsidiaries (collectively, “key persons”) as the Committee shall in its discretion select.

**1.4 Types of Awards Under the Plan**

Awards may be made under the Plan in the form of: (a) incentive stock options (within the meaning of section 422 of the Code); (b) nonqualified stock options; (c) stock appreciation rights; (d) restricted stock; (e) restricted stock units; and (f) other stock-based awards, all as more fully set forth in Article II. The term “award” means any of the foregoing. No incentive stock option may be granted to a person who is not an employee of the Company on the date of grant.

**1.5 Shares Available for Awards**

1.5.1 The total number of shares of the Common Stock which may be transferred pursuant to awards granted under the Plan shall not exceed 1,000,000. The 1,000,000 shares referred to in the immediately preceding sentence include 100,000 (post August 2018 reverse stock split) shares of common stock initially included in the Plan when the Plan was adopted on September 27, 2010, 100,000 (post August 2018 reverse stock split) shares added to the Plan as of September 17, 2013, 66,666 (post August 2018 reverse stock split) shares added to the Plan as of May 15, 2015, 200,000 (post August 2018 reverse stock split) shares added to the Plan as of May 31, 2016, 116,666 (post August 2018 reverse stock split) shares added to the Plan as of June 30, 2017 and 500,000 (post August 2018 reverse stock split) shares added to the Plan as of August , 2018. Such shares may be authorized but unissued shares of the Common Stock or authorized and issued shares of the Common Stock held in the Company’s treasury or acquired by the Company for the purposes of the Plan. The Committee may direct that any stock certificate evidencing shares issued pursuant to the Plan shall bear a legend setting forth such restrictions on transferability as may apply to such shares pursuant to the Plan. If, after the effective date of the Plan, any award is forfeited or any award otherwise terminates or is cancelled without the delivery of shares of Stock, then the shares covered by such award or to which such award relates shall again become available for transfer pursuant to awards granted or to be granted under this Plan. Any shares of Stock delivered by the Company, any shares of Stock with respect to which awards are made by the Company and any shares of Stock with respect to which the Company becomes obligated to make awards, through the assumption of, or in substitution for, outstanding awards previously granted by an acquired entity, shall not be counted against the shares available for awards under this Plan.

1.5.2 Upon certain changes in Stock, the number of shares of Stock available for issuance with respect to awards under the Plan, as set forth in Sections 1.5.1 and 1.5.2, shall be adjusted pursuant to Section 3.7.1.

1.5.3 Except as provided in this Section 1.5 and in Section 2.3.7, there shall be no limit on the number or the value of the shares of Stock that may be subject to awards to any individual under the Plan.

**1.6 Definitions of Certain Terms**

1.6.1 The “Fair Market Value” of a share of Stock on any day shall be determined as follows.

(a) If the principal market for the Stock (the “Market”) is a national securities exchange, the last sale price or, if no reported sales take place on the applicable date, the average of the high bid and low asked price of Stock as reported for such Market on such date or, if no such quotation is made on such date, on the next preceding day on which there were quotations, provided that such quotations shall have been made within the ten (10) business days preceding the applicable date;

(b) If the Market is the Over the Counter Bulletin Board or another market, the average of the high bid and low asked price for Stock on the applicable date, or, if no such quotations shall have been made on such date, on the next preceding day on which there were quotations, provided that such quotations shall have been made within the ten (10) business days preceding the applicable date; or

(c) In the event that neither paragraph (a) nor (b) shall apply, the Fair Market Value of a share of Stock on any day shall be determined in good faith by the Committee.

1.6.2 The term “incentive stock option” means an option that is intended to qualify for special federal income tax treatment pursuant to sections 421 and 422 of the Code, as now constituted or subsequently amended, or pursuant to a successor provision of the Code, and which is so designated in the applicable Plan Agreement. Any option that is not specifically designated as an incentive stock option shall under no circumstances be considered an incentive stock option. Any option that is not an incentive stock option is referred to herein as a “nonqualified stock option.”

1.6.3 The term “employment” means, in the case of a grantee of an award under the Plan who is not an employee of the Company, the grantee’s association with the Company or a subsidiary as a director, consultant or otherwise.

1.6.4 A grantee shall be deemed to have a “termination of employment” upon ceasing to be employed by the Company and all of its subsidiaries or by a corporation assuming awards in a transaction to which section 424(a) of the Code applies. The Committee may in its discretion determine (a) whether any leave of absence constitutes a termination of employment for purposes of the Plan, (b) the impact, if any, of any such leave of absence on awards theretofore made under the Plan, and (c) when a change in a non-employee’s association with the Company constitutes a termination of employment for purposes of the Plan. The Committee shall have the right to determine whether the termination of a grantee’s employment is a dismissal for cause and the date of termination in such case, which date the Committee may retroactively deem to be the date of the action that is cause for dismissal. Such determinations of the Committee shall be final, binding and conclusive.

1.6.5 The term “cause,” when used in connection with termination of a grantee’s employment, shall have the meaning set forth in any then-effective employment agreement between the grantee and the Company or a subsidiary thereof. In the absence, of or in addition to, as the case may be, such an employment agreement provision, “cause” means: (a) conviction of any crime (whether or not involving the Company) constituting a felony in the jurisdiction involved; (b) engaging in any substantiated act involving moral turpitude; (c) engaging in any act which, in each case, subjects, or if generally known would subject, the Company to public ridicule or embarrassment; (d) material violation of the Company’s policies, including, without limitation, those relating to sexual harassment or the disclosure or misuse of confidential information; (e) serious neglect or misconduct in the performance of the grantee’s duties for the Company or a subsidiary or willful or repeated failure or refusal to perform such duties; in each case as determined by the Committee, which determination shall be final, binding and conclusive.

## **ARTICLE II AWARDS UNDER THE PLAN**

### **2.1 Agreements Evidencing Awards**

Each award granted under the Plan shall be evidenced by a written agreement (“Plan Agreement”) which shall contain such provisions as the Committee in its discretion deems necessary or desirable. Such provisions may include, without limitation, a requirement that the grantee become a party to a stockholders’ agreement with respect to any shares of Stock acquired pursuant to the award, a requirement that the grantee acknowledge that such shares are acquired for investment purposes only, and a right of first refusal exercisable by the Company in the event that the grantee wishes to transfer any such shares. The Committee may grant awards in tandem with or in substitution for any other award or awards granted under this Plan or any award granted under any other plan of the Company or any subsidiary. Payments or transfers to be made by the Company or any subsidiary upon the grant, exercise or payment of an award may be made in such form as the Committee shall determine, including cash, shares of Stock, other securities, other awards or other property and may be made in a single payment or transfer, in installments or on a deferred basis, in each case in accordance with rules established by the Committee. By accepting an award pursuant to the Plan, a grantee thereby agrees that the award shall be subject to all of the terms and provisions of the Plan and the applicable Plan Agreement.

## **2.2 No Rights as a Stockholder**

No grantee of an option or stock appreciation right (or other person having the right to exercise such award) shall have any of the rights of a stockholder of the Company with respect to shares subject to such award until the issuance of a stock certificate to such person for such shares.

## **2.3 Grant of Stock Options and Stock Appreciation Rights**

2.3.1 The Committee may grant incentive stock options and nonqualified stock options (collectively, “options”) to purchase shares of the Common Stock from the Company, to such key persons, in such amounts and subject to such terms and conditions, as the Committee shall determine in its discretion, subject to the provisions of the Plan.

2.3.2 The Committee may grant stock appreciation rights to such key persons, in such amounts and subject to such terms and conditions, as the Committee shall determine in its discretion, subject to the provisions of the Plan. Stock appreciation rights may be granted in connection with all or any part of, or independently of, any option granted under the Plan. A stock appreciation right granted in connection with a nonqualified stock option may be granted at or after the time of grant of such option. A stock appreciation right granted in connection with an incentive stock option may be granted only at the time of grant of such option.

2.3.3 The grantee of a stock appreciation right shall have the right, subject to the terms of the Plan and the applicable Plan Agreement, to receive from the Company an amount equal to (a) the excess of the Fair Market Value of a share of the Common Stock on the date of exercise of the stock appreciation right over (b) the exercise price of such right as set forth in the Plan Agreement (or over the option exercise price if the stock appreciation right is granted in connection with an option), multiplied by (c) the number of shares with respect to which the stock appreciation right is exercised. Payment upon exercise of a stock appreciation right shall be in cash or in shares of the Common Stock (valued at their Fair Market Value on the date of exercise of the stock appreciation right) or both, all as the Committee shall determine in its discretion. Upon the exercise of a stock appreciation right granted in connection with an option, the number of shares subject to the option shall be correspondingly reduced by the number of shares with respect to which the stock appreciation right is exercised. Upon the exercise of an option in connection with which a stock appreciation right has been granted, the number of shares subject to the stock appreciation right shall be correspondingly reduced by the number of shares with respect to which the option is exercised.

2.3.4 Each Plan Agreement with respect to an option shall set forth the amount (the “option exercise price”) payable by the grantee to the Company upon exercise of the option evidenced thereby. The option exercise price per share shall be determined by the Committee in its discretion; *provided, however*, that the option exercise price of an incentive stock option shall be at least 100% of the Fair Market Value of a share of the Common Stock on the date the option is granted, and provided further that in no event shall the option exercise price be less than the par value of a share of the Common Stock.

2.3.5 Each Plan Agreement with respect to an option or stock appreciation right shall set forth the periods during which the award evidenced thereby shall be exercisable, whether in whole or in part. Such periods shall be determined by the Committee in its discretion; *provided, however*, that no incentive stock option (or a stock appreciation right granted in connection with an incentive stock option) shall be exercisable more than 10 years after the date of grant.

2.3.6 The Committee may in its discretion include in any Plan Agreement with respect to an option (the “original option”) a provision that an additional option (the “additional option”) shall be granted to any grantee who, pursuant to Section 2.4.3(b), delivers shares of the Common Stock in partial or full payment of the exercise price of the original option. The additional option shall be for a number of shares of the Common Stock equal to the number thus delivered, shall have an exercise price equal to the Fair Market Value of a share of the Common Stock on the date of exercise of the original option, and shall have an expiration date no later than the expiration date of the original option. In the event that a Plan Agreement provides for the grant of an additional option, such Agreement shall also provide that the exercise price of the original option be no less than the Fair Market Value of a share of Stock on its date of grant, and that any shares that are delivered pursuant to Section 2.4.3(b) in payment of such exercise price shall have been held for at least six months.

2.3.7 To the extent that the aggregate Fair Market Value (determined as of the time the option is granted) of the stock with respect to which incentive stock options granted under this Plan and all other plans of the Company and any subsidiary are first exercisable by any employee during any calendar year shall exceed the maximum limit (currently, \$100,000), if any, imposed from time to time under section 422 of the Code, such options shall be treated as nonqualified stock options.

2.3.8 Notwithstanding the provisions of Sections 2.3.4 and 2.3.5, to the extent required under section 422 of the Code, an incentive stock option may not be granted under the Plan to an individual who, at the time the option is granted, owns stock possessing more than 10% of the total combined voting power of all classes of stock of his employer corporation or of its parent or subsidiary corporations (as such ownership may be determined for purposes of section 422(b)(6) of the Code) unless (a) at the time such incentive stock option is granted the option exercise price is at least 110% of the Fair Market Value of the shares subject thereto and (b) the incentive stock option by its terms is not exercisable after the expiration of 5 years from the date it is granted.

#### **2.4 Exercise of Options and Stock Appreciation Rights**

Subject to the provisions of this Article II, each option or stock appreciation right granted under the Plan shall be exercisable as follows:

2.4.1 Unless the applicable Plan Agreement otherwise provides, an option or stock appreciation right may be exercised from time to time as to all or part of the shares as to which such award is then exercisable (but, in any event, only for whole shares). A stock appreciation right granted in connection with an option may be exercised at any time when, and to the same extent that, the related option may be exercised. An option or stock appreciation right shall be exercised by the filing of a written notice with the Company, on such form and in such manner as the Committee shall prescribe.

2.4.2 Any written notice of exercise of an option shall be accompanied by payment for the shares being purchased. Such payment shall be made: (a) by certified or official bank check (or the equivalent thereof acceptable to the Company) for the full option exercise price; or (b) unless the applicable Plan Agreement provides otherwise, by delivery of shares of the Common Stock (which, if acquired pursuant to exercise of a stock option, were acquired at least six months prior to the option exercise date) and having a Fair Market Value (determined as of the exercise date) equal to all or part of the option exercise price and a certified or official bank check (or the equivalent thereof acceptable to the Company) for any remaining portion of the full option exercise price; or (c) at the discretion of the Committee and to the extent permitted by law, by such other provision as the Committee may from time to time prescribe.

2.4.3 Promptly after receiving payment of the full option exercise price, or after receiving notice of the exercise of a stock appreciation right for which payment will be made partly or entirely in shares, the Company shall, subject to the provisions of Section 3.3 (relating to certain restrictions), deliver to the grantee or to such other person as may then have the right to exercise the award, a certificate or certificates for the shares of the Common Stock for which the award has been exercised. If the method of payment employed upon option exercise so requires, and if applicable law permits, an optionee may direct the Company to deliver the certificate(s) to the optionee's stockbroker.

#### **2.5 Termination of Employment; Death**

2.5.1 Except to the extent otherwise provided in Section 2.5.2 or 2.5.3 or in the applicable Plan Agreement, all options and stock appreciation rights not theretofore exercised shall terminate upon termination of the grantee's employment for any reason (including death).

2.5.2 If a grantee's employment terminates for any reason other than death or dismissal for cause, the grantee may exercise any outstanding option or stock appreciation right on the following terms and conditions: (a) exercise may be made only to the extent that the grantee was entitled to exercise the award on the date of employment termination; and (b) exercise must occur within 90 days after employment terminates, except that this 90 day period shall be increased to one year if the termination is by reason of disability, but in no event after the expiration date of the award as set forth in the Plan Agreement. In the case of an incentive stock option, the term "disability" for purposes of the preceding sentence shall have the meaning given to it by section 422(c)(6) of the Code.

2.5.3 If a grantee dies while employed by the Company or any subsidiary, or after employment termination but during the period in which the grantee's awards are exercisable pursuant to Section 2.5.2, any outstanding option or stock appreciation right shall be exercisable on the following terms and conditions: (a) exercise may be made only to the extent that the grantee was entitled to exercise the award on the date of death; and (b) exercise must occur by the earlier of the first anniversary of the grantee's death or the expiration date of the award. Any such exercise of an award following a grantee's death shall be made only by the grantee's executor or administrator, unless the grantee's will specifically disposes of such award, in which case such exercise shall be made only by the recipient of such specific disposition. If a grantee's personal representative or the recipient of a specific disposition under the grantee's will shall be entitled to exercise any award pursuant to the preceding sentence, such representative or recipient shall be bound by all the terms and conditions of the Plan and the applicable Plan Agreement which would have applied to the grantee including, without limitation, the provisions of Sections 3.3 and 3.7 hereof.

## **2.6 Grant of Restricted Stock**

2.6.1 The Committee may grant restricted shares of Stock to such key persons, in such amounts, and subject to such terms and conditions as the Committee shall determine in its discretion, subject to the provisions of the Plan. Restricted stock awards may be made independently of or in connection with any other award under the Plan. A grantee of a restricted stock award shall have no rights with respect to such award unless such grantee accepts the award within such period as the Committee shall specify by executing a Plan Agreement in such form as the Committee shall determine and, if the Committee shall so require, makes payment to the Company by certified or official bank check (or the equivalent thereof acceptable to the Company) in such amount as the Committee may determine.

2.6.2 Promptly after a grantee accepts a restricted stock award, the Company shall issue in the grantee's name a certificate or certificates for the shares of the Common Stock covered by the award. Upon the issuance of such certificate(s), the grantee shall have the rights of a stockholder with respect to the restricted stock, subject to the nontransferability restrictions and Company repurchase rights described in Sections 2.6.4 and 2.6.5 and to such other restrictions and conditions as the Committee in its discretion may include in the applicable Plan Agreement.

2.6.3 Unless the Committee shall otherwise determine, any certificate issued evidencing shares of restricted stock shall remain in the possession of the Company until such shares are free of any restrictions specified in the applicable Plan Agreement.

2.6.4 Shares of restricted stock may not be sold, assigned, transferred, pledged or otherwise encumbered or disposed of except as specifically provided in this Plan or the applicable Plan Agreement. The Committee at the time of grant shall specify the date or dates (which may depend upon or be related to the attainment of performance goals and other conditions) on which the nontransferability of the restricted stock shall lapse. Unless the applicable Plan Agreement provides otherwise, additional shares of Stock or other property distributed to the grantee in respect of shares of restricted stock, as dividends or otherwise, shall be subject to the same restrictions applicable to such restricted stock.

2.6.5 During the 120 days following termination of the grantee's employment for any reason, the Company shall have the right to require the return of any shares to which restrictions on transferability apply, in exchange for which the Company shall repay to the grantee (or the grantee's estate) any amount paid by the grantee for such shares.

## **2.7 Grant of Restricted Stock Units**

2.7.1 The Committee may grant awards of restricted stock units to such key persons, in such amounts, and subject to such terms and conditions as the Committee shall determine in its discretion, subject to the provisions of the Plan. Restricted stock units may be awarded independently of or in connection with any other award under the Plan.

2.7.2 At the time of grant, the Committee shall specify the date or dates on which the restricted stock units shall become fully vested and nonforfeitable, and may specify such conditions to vesting as it deems appropriate. In the event of the termination of the grantee's employment by the Company and its subsidiaries for any reason, restricted stock units that have not become nonforfeitable shall be forfeited and cancelled. The Committee at any time may accelerate vesting dates and otherwise waive or amend any conditions of an award of restricted stock units.

2.7.3 At the time of grant, the Committee shall specify the maturity date applicable to each grant of restricted stock units, which may be determined at the election of the grantee. Such date may be later than the vesting date or dates of the award. On the maturity date, the Company shall transfer to the grantee one unrestricted, fully transferable share of the Common Stock for each restricted stock unit scheduled to be paid out on such date and not previously forfeited. The Committee shall specify the purchase price, if any, to be paid by the grantee to the Company for such shares of the Common Stock.

## **2.8 Other Stock-Based Awards**

The Committee may grant other types of stock-based awards (including the grant of unrestricted shares) to such key persons, in such amounts and subject to such terms and conditions, as the Committee shall in its discretion determine, subject to the provisions of the Plan. Such awards may entail the transfer of actual shares of the Common Stock to Plan participants, or payment in cash or otherwise of amounts based on the value of shares of the Common Stock.

## **ARTICLE III MISCELLANEOUS**

### **3.1 Amendment of the Plan; Modification of Awards**

3.1.1 The Board may from time to time suspend, discontinue, revise or amend the Plan in any respect whatsoever, except that no such amendment shall materially impair any rights or materially increase any obligations under any award theretofore made under the Plan without the consent of the grantee (or, after the grantee's death, the person having the right to exercise the award). For purposes of this Section 3.1, any action of the Board or the Committee that alters or affects the tax treatment of any award shall not be considered to materially impair any rights of any grantee.

3.1.2 Stockholder approval of any amendment shall be obtained to the extent necessary to comply with section 422 of the Code (relating to incentive stock options) or other applicable law or regulation.

3.1.3 The Committee may amend any outstanding Plan Agreement, including, without limitation, by amendment which would accelerate the time or times at which the award becomes unrestricted or may be exercised, or waive or amend any goals, restrictions or conditions set forth in the Agreement. However, any such amendment (other than an amendment pursuant to Section 3.7.2, relating to change in control) that materially impairs the rights or materially increases the obligations of a grantee under an outstanding award shall be made only with the consent of the grantee (or, upon the grantee's death, the person having the right to exercise the award).

### **3.2 Tax Withholding**

3.2.1 As a condition to the receipt of any shares of the Common Stock pursuant to any award or the lifting of restrictions on any award, or in connection with any other event that gives rise to a federal or other governmental tax withholding obligation on the part of the Company relating to an award (including, without limitation, FICA tax), the Company shall be entitled to require that the grantee remit to the Company an amount sufficient in the opinion of the Company to satisfy such withholding obligation.

3.2.2 If the event giving rise to the withholding obligation is a transfer of shares of the Common Stock, then, unless otherwise specified in the applicable Plan Agreement, the grantee may satisfy the withholding obligation imposed under Section 3.2.1 by electing to have the Company withhold shares of the Common Stock having a Fair Market Value equal to the amount of tax to be withheld. For this purpose, Fair Market Value shall be determined as of the date on which the amount of tax to be withheld is determined (and any fractional share amount shall be settled in cash).

### **3.3 Restrictions**

3.3.1 If the Committee shall at any time determine that any consent (as hereinafter defined) is necessary or desirable as a condition of, or in connection with, the granting of any award under the Plan, the issuance or purchase of shares or other rights thereunder, or the taking of any other action thereunder (each such action being hereinafter referred to as a "plan action"), then such plan action shall not be taken, in whole or in part, unless and until such consent shall have been effected or obtained to the full satisfaction of the Committee.



3.3.2 The term “consent” as used herein with respect to any plan action means (a) any and all listings, registrations or qualifications in respect thereof upon any securities exchange or under any federal, state or local law, rule or regulation, (b) any and all written agreements and representations by the grantee with respect to the disposition of shares, or with respect to any other matter, which the Committee shall deem necessary or desirable to comply with the terms of any such listing, registration or qualification or to obtain an exemption from the requirement that any such listing, qualification or registration be made and (c) any and all consents, clearances and approvals in respect of a plan action by any governmental or other regulatory bodies.

#### **3.4 Non-assignability**

Except to the extent otherwise provided in the applicable Plan Agreement, no award or right granted to any person under the Plan shall be assignable or transferable other than by will or by the laws of descent and distribution, and all such awards and rights shall be exercisable during the life of the grantee only by the grantee or the grantee’s legal representative.

#### **3.5 Notification of Election Under Code Section 83(b)**

If any grantee shall, in connection with the acquisition of shares of the Common Stock under the Plan, make the election permitted under section 83(b) of the Code (that is, an election to include in gross income in the year of transfer the amounts specified in section 83(b)), such grantee shall notify the Company of such election within 10 days of filing notice of the election with the Internal Revenue Service, in addition to any filing and notification required pursuant to regulations issued under the authority of Code section 83(b).

#### **3.6 Notification Upon Disqualifying Disposition**

If any grantee shall make any disposition of shares of the Common Stock issued pursuant to the exercise of an incentive stock option under the circumstances described in section 421(b) of the Code (relating to certain disqualifying dispositions), such grantee shall notify the Company of such disposition within 10 days thereof.

#### **3.7 Adjustment Upon Changes in Stock**

3.7.1 Shares Available for Grants. In the event of any change in the number of shares of Stock outstanding by reason of any stock dividend or split, reverse stock split, recapitalization, merger, consolidation, combination or exchange of shares or similar corporate change, the maximum number of shares of the Common Stock with respect to which the Committee may grant awards under Article II hereof, as described in Section 1.5.1, and the individual annual limit described in Section 1.5.2, shall be appropriately adjusted by the Committee. In the event of any change in the number of shares of the Common Stock outstanding by reason of any other event or transaction, the Committee may, but need not, make such adjustments in the number and class of shares of the Common Stock with respect to which awards: (i) may be granted under Article II hereof and (ii) granted to any one employee of the Company or a subsidiary during any one calendar year, in each case as the Committee may deem appropriate, unless such adjustment would cause any award that would otherwise qualify as performance based compensation with respect to a “162(m) covered employee” (as defined in Section 162 of the Code), to cease to so qualify, if Section 162(m) of the Code is applicable.

3.7.2 Outstanding Restricted Stock and Restricted Stock Units. Unless the Committee in its absolute discretion otherwise determines, any securities or other property (including dividends paid in cash) received by a grantee with respect to a share of restricted stock, the issue date with respect to which occurs prior to such event, but which has not vested as of the date of such event, as a result of any dividend, stock split, reverse stock split, recapitalization, merger, consolidation, combination, exchange of shares or otherwise will not vest until such share of restricted stock vests, and shall be promptly deposited with the Company or otherwise treated as was the certificate for the underlying share of restricted stock, pursuant to Section 2.6.3 hereof.

The Committee may, in its absolute discretion, adjust any grant of shares of restricted stock, the issue date with respect to which has not occurred as of the date of the occurrence of any of the following events, or any grant of restricted stock units, to reflect any dividend, stock split, reverse stock split, recapitalization, merger, consolidation, combination, exchange of shares or similar corporate change as the Committee may deem appropriate to prevent the enlargement or dilution of rights of grantees.

3.7.3 Outstanding Options and Stock Appreciation Rights — Increase or Decrease in Issued Shares Without Consideration. Subject to any required action by the stockholders of the Company, in the event of any increase or decrease in the number of issued shares of Stock resulting from a subdivision or consolidation of shares of Stock or the payment of a stock dividend (but only on the shares of Stock), or any other increase or decrease in the number of such shares effected without receipt of consideration by the Company, the Committee shall proportionally adjust the number of shares of the Common Stock subject to each outstanding option and stock appreciation right, and the exercise price-per-share of the Common Stock of each such option and stock appreciation right.

3.7.4 Outstanding Options and Stock Appreciation Rights — Certain Mergers. Subject to any required action by the stockholders of the Company, in the event that the Company shall be the surviving corporation in any merger or consolidation (except a merger or consolidation as a result of which the holders of shares of Stock receive securities of another corporation), each option and stock appreciation right outstanding on the date of such merger or consolidation shall pertain to and apply to the securities which a holder of the number of shares of the Common Stock subject to such option or stock appreciation right would have received in such merger or consolidation.

3.7.5 Outstanding Options and Stock Appreciation Rights — Certain Other Transactions. In the event of (i) a dissolution or liquidation of the Company, (ii) a sale of all or substantially all of the Company's assets, (iii) a merger or consolidation involving the Company in which the Company is not the surviving corporation or (iv) a merger or consolidation involving the Company in which the Company is the surviving corporation but the holders of shares of the Common Stock receive securities of another corporation and/or other property, including cash, the Committee shall, in its absolute discretion, have the power to:

- (i) cancel, effective immediately prior to the occurrence of such event, each option and stock appreciation right outstanding immediately prior to such event (whether or not then exercisable), and, in full consideration of such cancellation, pay to the grantee to whom such option or stock appreciation right was granted an amount in cash, for each share of the Common Stock subject to such option or stock appreciation right, respectively, equal to the excess of (x) the value, as determined by the Committee in its absolute discretion, of the property (including cash) received by the holder of a share of the Common Stock as a result of such event over (y) the exercise price of such option or stock appreciation right;
- (ii) cancel, effective immediately prior to the occurrence of such event, each option and stock appreciation right outstanding immediately prior to such event (whether or not then exercisable), and, in full consideration of such cancellation, pay to the grantee to whom such option or stock appreciation right was granted, for each share of the Common Stock subject to such option or stock appreciation right, respectively, the property (including cash) received by the holder of a share of the Common Stock as a result of such event; or
- (iii) provide for the exchange of each option and stock appreciation right outstanding immediately prior to such event (whether or not then exercisable) for an option on or stock appreciation right with respect to, as appropriate, some or all of the property which a holder of the number of shares of the Common Stock subject to such option or stock appreciation right would have received and, incident thereto, make an equitable adjustment as determined by the Committee in its absolute discretion in the exercise price of the option or stock appreciation right, or the number of shares or amount of property subject to the option or stock appreciation right or, if appropriate, provide for a cash payment to the grantee to whom such option or stock appreciation right was granted in partial consideration for the exchange of the option or stock appreciation right.

**7.6 Outstanding Options and Stock Appreciation Rights — Other Changes.** In the event of any change in the capitalization of the Company or a corporate change other than those specifically referred to in Sections 3.7.3, 3.7.4 or 3.7.5 hereof, the Committee may, in its absolute discretion, make such adjustments in the number and class of shares subject to options and stock appreciation rights outstanding on the date on which such change occurs and in the per-share exercise price of each such option and stock appreciation right as the Committee may consider appropriate to prevent dilution or enlargement of rights. In addition, if and to the extent the Committee determines it is appropriate, the Committee may elect to cancel each option and stock appreciation right outstanding immediately prior to such event (whether or not then exercisable), and, in full consideration of such cancellation, pay to the grantee to whom such option or stock appreciation right was granted an amount in cash, for each share of the Common Stock subject to such option or stock appreciation right, respectively, equal to the excess of (i) the Fair Market Value of the Common Stock on the date of such cancellation over (ii) the exercise price of such option or stock appreciation right.

**3.7.7 No Other Rights.** Except as expressly provided in the Plan, no grantee shall have any rights by reason of any subdivision or consolidation of shares of stock of any class, the payment of any dividend, any increase or decrease in the number of shares of stock of any class or any dissolution, liquidation, merger or consolidation of the Company or any other corporation. Except as expressly provided in the Plan, 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 thereof shall be made with respect to, the number of shares of the Common Stock subject to an award or the exercise price of any option or stock appreciation right. Except as otherwise provided in Section 3.7, no adjustment shall be made for dividends, distributions or other rights (whether ordinary or extraordinary, and whether in cash, securities or other property) for which the record date is prior to the date such stock certificate is issued.

### **3.8 Right of Discharge Reserved**

Nothing in the Plan or in any Plan Agreement shall confer upon any grantee the right to continue in the employ of the Company or affect any right which the Company may have to terminate such employment.

### **3.9 Nature of Payments**

3.9.1 Any and all grants of awards and issuances of shares of the Common Stock under the Plan shall be in consideration of services performed for the Company by the grantee.

3.9.2 All such grants and issuances shall constitute a special incentive payment to the grantee and shall not be taken into account in computing the amount of salary or compensation of the grantee for the purpose of determining any benefits under any pension, retirement, profit-sharing, bonus, life insurance or other benefit plan of the Company or under any agreement between the Company and the grantee, unless such plan or agreement specifically provides otherwise.

### **3.10 Non-Uniform Determinations**

The Committee's determinations under the Plan need not be uniform and may be made by it selectively among persons who receive, or are eligible to receive, awards under the Plan (whether or not such persons are similarly situated). Without limiting the generality of the foregoing, the Committee shall be entitled, among other things, to make non-uniform and selective determinations, and to enter into non-uniform and selective Plan agreements, as to (a) the persons to receive awards under the Plan, (b) the terms and provisions of awards under the Plan, and (c) the treatment of leaves of absence pursuant to Section 1.6.4.

### **3.11 Other Payments or Awards**

Nothing contained in the Plan shall be deemed in any way to limit or restrict the Company from making any award or payment to any person under any other plan, arrangement or understanding, whether now existing or hereafter in effect.

**3.12 Section Headings**

The section headings contained herein are for the purpose of convenience only and are not intended to define or limit the contents of the sections.

**3.13 Effective Date and Term of Plan**

3.13.1 The Plan was adopted by the Board on September 27, 2010, subject to approval by the Company's stockholders, which approval occurred on November 2, 2010. The Plan was amended on each of September 17, 2013, May 15, 2015, May 31, 2016 and July 5, 2017 to increase by 3,000,000, 2,000,000, 6,000,000 and 3,500,000 (85,714, 57,142, 171,428 and 100,000 post August 2018 reverse stock split) the number of shares of the Common Stock that may be granted under the Plan. The Plan was further amended on August, 2018, to increase the number of shares of the Common Stock that may be granted pursuant to awards under the Plan by 500,000 (post August 2018 reverse stock split) shares of Common Stock, subject to approval by the Company's stockholders. All awards under the Plan prior to such stockholder approval are subject in their entirety to such approval. If such approval is not obtained prior to the first anniversary of the date of adoption of the Plan, the Plan and all awards thereunder shall terminate on that date.

3.13.2 Unless sooner terminated by the Board, the Plan will terminate on the close of business on September 27, 2020, ten years from the original effective date. All awards made under the Plan prior to its termination shall remain in effect until such awards have been satisfied or terminated in accordance with the terms and provisions of the Plan and the applicable Plan Agreements.

**3.14 Governing Law**

All rights and obligations under the Plan shall be construed and interpreted in accordance with the laws of the State of Nevada, without giving effect to principles of conflict of laws.

**SYNTHETIC BIOLOGICS, INC.  
THIS PROXY IS SOLICITED BY THE BOARD OF DIRECTORS  
IN CONNECTION WITH THE 2018 ANNUAL MEETING OF STOCKHOLDERS  
TO BE HELD AT 9:30 A.M. (EASTERN TIME) ON SEPTEMBER 24, 2018**

PROXY: STEVEN SHALLCROSS, is hereby appointed by the undersigned as attorney and proxy with full power of substitution, to vote at the 2018 Annual Meeting of Stockholders of Synthetic Biologics, Inc. and at any adjournment(s) or postponement(s) of that meeting.

WITH RESPECT TO ANY MATTER THAT SHOULD PROPERLY COME BEFORE THE 2018 ANNUAL MEETING OF STOCKHOLDERS THAT IS NOT SPECIFIED HEREIN, THIS PROXY, WILL BE VOTED IN THE DISCRETION OF THE PROXY HOLDER.  
PLEASE SIGN AND DATE AND RETURN PROMPTLY

**IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIAL  
FOR THE 2018 ANNUAL MEETING OF STOCKHOLDERS  
TO BE HELD AT 9:30 A.M. (EASTERN TIME) ON SEPTEMBER 24, 2018**

THE NOTICE OF ANNUAL MEETING OF STOCKHOLDERS, THE PROXY STATEMENT AND OUR ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2017 ARE AVAILABLE ON THE INTERNET AT: *WWW.SYNTHETICBIOLOGICS.COM*.

**VOTE BY INTERNET**

It is fast, convenient, and your vote is immediately confirmed and posted.

**A. THE BOARD OF DIRECTORS OF SYNTHETIC BIOLOGICS, INC.  
RECOMMENDS THAT YOU VOTE  
FOR ALL NOMINEES LISTED IN PROPOSAL 1,  
FOR PROPOSALS 2, 3, 4 and 5**

**PROPOSAL 1.** Election of the following director nominees to serve for the following year and until his successor is elected: Nominees are: Jeffrey J. Kraws, Scott L. Tarriff and Jeffrey Wolf.

FOR ALL NOMINEES	WITHHOLD AUTHORITY FOR ALL NOMINEES	WITHHELD FOR THE FOLLOWING ONLY: (WRITE THE NAME(S) OF THE NOMINEE(S) IN THE SPACE BELOW)
<input type="checkbox"/>	<input type="checkbox"/>	

**PROPOSAL 2.** Ratification of the selection of BDO USA, LLP as our independent registered public accounting firm for the year ending December 31, 2018.

FOR	AGAINST	ABSTAIN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**PROPOSAL 3** Approval of an amendment to our Articles of Incorporation to effect an increase in our authorized number of shares of common stock from 10,000,000 to 200,000,000.

**PROPOSAL 4.** Approval to authorize an adjournment of the Annual Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 3.

FOR	AGAINST	ABSTAIN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**PROPOSAL 5.** Approval of an amendment to our 2010 Stock Incentive Plan to increase the number of shares of common stock that we will have authority to grant under the Plan by 500,000 shares of common stock and to address certain recent changes to the U.S. federal income tax laws.

FOR	AGAINST	ABSTAIN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**B. NON-VOTING ITEMS**

**Change of Address** — Please print your new address below.

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**Comments** — Please print your comments below.

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**Meeting Attendance**

Mark the box to the right if you plan to attend the 2018 Annual Meeting of Stockholders.

**C. AUTHORIZED SIGNATURES**

**This section must be completed for your vote to be counted. — Date and Sign Below**

Dated:

Signature(s) of Stockholder(s):

Title:

Please mark, date and sign exactly as your name appears on this proxy card and return in the enclosed envelope. If acting as executor, administrator, trustee, guardian, etc., you should so indicate when signing. If the signer is a corporation, please sign the full corporate name, by a duly authorized officer. If shares are held jointly, each stockholder named should sign.