

ARCA biopharma, Inc.
Form 424B4
April 14, 2015

**Filed pursuant to Rule 424(b)(4)
Registration No. 333-187508**

Prospectus Supplement No. 34

(to Prospectus dated May 30, 2013)

125,000 Shares of Series A Convertible Preferred Stock

12,500,000 Shares of Common Stock Underlying the Preferred Stock

Warrants to Purchase up to 6,250,000 Shares of Common Stock and

6,250,000 Shares of Common Stock Underlying the Warrants

ARCA biopharma, Inc.

This prospectus supplement supplements the prospectus dated May 30, 2013 (the Prospectus), as supplemented by that certain Prospectus Supplement No. 1 dated July 17, 2013 (Supplement No. 1), by that certain Prospectus Supplement No. 2 dated July 19, 2013 (Supplement No. 2), by that certain Prospectus Supplement No. 3 dated July 24, 2013 (Supplement No. 3), by that certain Prospectus Supplement No. 4 dated July 30, 2013 (Supplement No. 4), by that certain Prospectus Supplement No. 5 dated August 6, 2013 (Supplement No. 5), by that certain Prospectus Supplement No. 6 dated September 4, 2013 (Supplement No. 6), by that certain Prospectus Supplement No. 7 dated September 23, 2013 (Supplement No. 7), by that certain Prospectus Supplement No. 8 dated October 29, 2013 (Supplement No. 8), by that certain Prospectus Supplement No. 9 dated November 6, 2013 (Supplement No. 9), by that certain Prospectus Supplement No. 10 dated November 13, 2013 (Supplement No. 10), by that certain Prospectus Supplement No. 11 dated November 21, 2013 (Supplement No. 11), by that certain Prospectus Supplement No. 12 dated December 5, 2013 (Supplement No. 12), by that certain Prospectus Supplement No. 13 dated January 8, 2014 (Supplement No. 13), by that certain Prospectus Supplement No. 14 dated February 10, 2014 (Supplement No. 14), by that certain Prospectus Supplement No. 15 dated February 12, 2014 (Supplement No. 15), by that certain Prospectus Supplement No. 16 dated February 18, 2014 (Supplement No. 16), by that certain Prospectus Supplement No. 17 dated March 3, 2014 (Supplement No. 17), by that certain Prospectus Supplement No. 18 dated March 20, 2014 (Supplement No. 18), by that certain Prospectus Supplement No. 19 dated May 13, 2014 (Supplement No. 19), by that certain Prospectus Supplement No. 20 dated June 9, 2014 (Supplement No. 20), by that certain Prospectus Supplement No. 21 dated August 13, 2014 (Supplement No. 21), by that certain Prospectus Supplement No. 22 dated August 18, 2014 (Supplement No. 22), by that certain Prospectus Supplement No. 23 dated November 12, 2014 (Supplement No. 23), by that certain Prospectus Supplement No. 24 dated December 1, 2014 (Supplement No. 24), by that certain Prospectus Supplement No. 25 dated December 10, 2014 (Supplement No. 25), by that certain Prospectus Supplement No. 26 dated December 11, 2014 (Supplement No. 26), by that certain Prospectus Supplement No. 27

dated December 30, 2014 (Supplement No. 27), by that certain Prospectus Supplement No. 28 dated February 4, 2015 (Supplement No. 28), by that certain Prospectus Supplement No. 29 dated February 17, 2015 (Supplement No. 29), by that certain Prospectus Supplement No. 30 dated February 23, 2015 (Supplement No. 30), by that certain Prospectus Supplement No. 31 dated March 16, 2015 (Supplement No. 31), by that certain Prospectus Supplement No. 32 dated March 19, 2015 (Supplement No. 32), and by that certain Prospectus Supplement No. 33 dated April 13, 2015 (Supplement No. 33), together with Supplement No. 1, Supplement No. 2, Supplement No. 3, Supplement No. 4, Supplement No. 5, Supplement No. 6, Supplement No. 7, Supplement No. 8, Supplement No. 9, Supplement No. 10, Supplement No. 11, Supplement No. 12, Supplement No. 13, Supplement No. 14, Supplement No. 15, Supplement No. 16, Supplement No. 17, Supplement No. 18, Supplement No. 19, Supplement No. 20, Supplement No. 21, Supplement No. 22, Supplement No. 23, Supplement No. 24, Supplement No. 25, Supplement No. 26, Supplement No. 27, Supplement No. 28, Supplement No. 29, Supplement No. 30, Supplement No. 31, and Supplement No. 32, the Supplements), which form a part of our Registration Statement on Form S-1 (Registration No. 333-187508). This prospectus supplement is being filed to update and supplement the information in the Prospectus and the Supplements with the information contained in our Definitive Proxy Statement on Schedule 14A, filed with the Securities and Exchange Commission (the Commission) on April 14, 2015 (the Definitive Proxy). Accordingly, we have attached the Definitive Proxy to this prospectus supplement.

The Prospectus, the Supplements and this prospectus supplement relate to the offer and sale of up to 125,000 shares of Series A Convertible Preferred Stock (Preferred Stock) which are convertible into 12,500,000 shares of Common Stock, warrants to purchase up to 6,250,000 shares of our Common Stock and 6,250,000 shares of Common Stock underlying the warrants.

This prospectus supplement should be read in conjunction with the Prospectus and the Supplements. This prospectus supplement updates and supplements the information in the Prospectus and the Supplements. If there is any inconsistency between the information in the Prospectus, the Supplements and this prospectus supplement, you should rely on the information in this prospectus supplement.

Our common stock is traded on the Nasdaq Global Market under the trading symbol ABIO. On April 14, 2015, the last reported sale price of our common stock was \$0.91 per share.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading Risk Factors beginning on page 5 of the Prospectus and beginning on page 15 of our annual report on Form 10-K for the period ended December 31, 2014 before you decide whether to invest in shares of our common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if the Prospectus or this prospectus supplement is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is April 14, 2015

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 Pursuant to § 240.14a-12

ARCA BIOPHARMA, INC.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement if other than the Registrant)

Payment of Filing Fee (Check the appropriate box)

No fee required.

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

1. Title of each class of securities to which transaction applies:

2. Aggregate number of securities to which transaction applies:

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

4. Proposed maximum aggregate value of transaction:

5. Total fee paid:

Fee paid previously with preliminary materials.

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

6. Amount Previously Paid:

7. Form, Schedule or Registration Statement No.:

8. Filing Party:

9. Date Filed:

ARCA BIOPHARMA, INC.

11080 CirclePoint Road, Suite 140

Westminster, Colorado 80020

April 14, 2015

Dear Stockholders of ARCA biopharma, Inc.:

You are cordially invited to attend the Annual Meeting of Stockholders of ARCA biopharma, Inc., a Delaware corporation (the "Company" or "ARCA"). The meeting will be held on Thursday, June 4, 2015 at 9:00 a.m. local time at the Renaissance Boulder Flatiron Hotel, 500 Flatiron Boulevard, Broomfield, CO 80021.

The matters scheduled to be considered at the meeting are (1) to elect the Board's nominees, Dr. Raymond L. Woosley and Mr. Dan J. Mitchell, to the Board of Directors to hold office until the 2018 Annual Meeting of Stockholders, (2) to ratify the selection by the Audit Committee of the Board of Directors of KPMG LLP ("KPMG") as the independent registered public accounting firm of the Company for its fiscal year ending December 31, 2015, (3) to approve amendments to the Company's restated certificate of incorporation, as amended, and authorize the Company's Board of Directors, if in their judgment it is necessary, to select and file one such amendment to effect a reverse stock split of the Company's Common Stock, at a ratio in the range of 3:1 to 20:1, such ratio to be determined at the discretion of the Board of Directors, and (4) to conduct any other business properly brought before the meeting. These items of business are more fully described in this proxy statement that you are encouraged to read in its entirety.

In accordance with the Securities and Exchange Commission ("SEC") rule ("Notice and Access Rule") that allows companies to furnish their proxy materials (including the form of proxy, this proxy statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2014, filed with the SEC on March 19, 2015,) over the Internet, we intend to send a Notice of Internet Availability of Proxy Materials ("Notice") on or about April 24, 2015 to our stockholders of record as of April 6, 2015. We will also provide access to our proxy materials over the Internet by April 24, 2015. As a result of the Notice and Access Rule, all stockholders receiving the Notice have the ability to access the proxy materials over the Internet and request to receive a paper copy of the proxy materials by mail. Instructions on how to access the proxy materials over the Internet or to request a paper copy may be found on the Notice. In addition, the Notice contains instructions on how stockholders may request to receive proxy materials electronically by e-mail.

All stockholders are cordially invited to attend the Annual Meeting in person. Whether or not you expect to attend the Annual Meeting, please vote, as instructed in the Notice of Internet Availability of Proxy Materials, via the Internet or the telephone, as promptly as possible in order to ensure your representation at the Annual Meeting. Alternatively, you may follow the procedures outlined in the Notice of Internet Availability of Proxy Materials to request a paper proxy card to submit your vote by mail. Even if you have voted by proxy, you may still vote in person if you attend the Annual Meeting. Please note, however, that if your shares are held of record by a broker, bank or other agent and you wish to vote at the Annual Meeting, you must obtain a proxy issued in your name from that record holder.

Sincerely,

/s/ Christopher Ozeroff
Christopher Ozeroff

Secretary, Senior Vice President and General
Counsel

ARCA BIOPHARMA, INC.

11080 CirclePoint Road, Suite 140

Westminster, Colorado 80020

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

TO BE HELD ON JUNE 4, 2015

Notice is hereby given that the Annual Meeting of Stockholders (the Annual Meeting) of ARCA biopharma, Inc., a Delaware corporation (the Company or ARCA) will be held on Thursday, June 4, 2015 at 9:00 a.m. local time at the Renaissance Boulder Flatiron Hotel, 500 Flatiron Boulevard, Broomfield, CO 80021 for the following purposes:

1. To elect the Board's nominees, Dr. Raymond L. Woosley and Mr. Dan J. Mitchell, to the Board of Directors to hold office until the 2018 Annual Meeting of Stockholders.
2. To ratify the selection by the Audit Committee of the Board of Directors of KPMG LLP as independent registered public accounting firm of the Company for its fiscal year ending December 31, 2015.
3. To approve amendments to the Company's restated certificate of incorporation, as amended, and authorize the Board of Directors, if in their judgment it is necessary, to select and file one such amendment to effect a reverse stock split of our common stock, at a ratio in the range of 3:1 to 20:1, such ratio to be determined at the discretion of the Board of Directors.
4. To conduct any other business properly brought before the meeting.

These items of business are more fully described in the proxy statement accompanying this Notice.

The record date for the Annual Meeting is April 6, 2015. Only stockholders of record at the close of business on that date may vote at the meeting or any adjournment thereof.

By Order of the Board of Directors:

/s/ Christopher Ozeroff
Christopher Ozeroff
Secretary, Senior Vice President and General
Counsel

WESTMINSTER, CO

APRIL 14, 2015

Pursuant to the Internet proxy rules promulgated by the Securities and Exchange Commission, the Company has elected to provide access to its proxy materials over the Internet. Accordingly, stockholders of record at the close of business on April 6, 2015 will receive a Notice of Internet Availability of Proxy Materials and may vote at the Annual Meeting and any adjournment or postponement thereof. The Company expects to mail the Notice of Internet Availability of Proxy Materials on or about April 24, 2015.

All stockholders are cordially invited to attend the Annual Meeting in person. Whether or not you expect to attend the Annual Meeting, please vote, as instructed in the Notice of Internet Availability of Proxy Materials, via the Internet or the telephone, as promptly as possible in order to ensure your representation at the annual meeting. Alternatively, you may follow the procedures outlined in the Notice of Internet Availability of Proxy Materials to request a paper proxy card to submit your vote by mail. Even if you have voted by proxy, you may still vote in person if you attend the Annual Meeting. Please note, however, that if your shares are held of record by a broker, bank or other agent and you wish to vote at the Annual Meeting, you must obtain a proxy issued in your name from that record holder.

ARCA BIOPHARMA, INC.

11080 CirclePoint Road, Suite 140

Westminster, Colorado 80020

PROXY STATEMENT

FOR THE 2015 ANNUAL MEETING OF STOCKHOLDERS

JUNE 4, 2015

This proxy statement (this Proxy Statement) is being furnished to holders of ARCA biopharma, Inc. (sometimes referred to as the Company, ARCA, we, us, and our) common stock, par value \$0.001 per share (the Common Proxies are being solicited on behalf of the Board of Directors of ARCA (the Board of Directors) to be used at the Annual Meeting of Stockholders (the Annual Meeting) to be held on Thursday, June 4, 2015 at 9:00 a.m. local time at the Renaissance Boulder Flatiron Hotel, 500 Flatiron Boulevard, Broomfield, CO 80021 and at any postponement or adjournment thereof, for the purposes set forth in the Notice of Annual Meeting of Stockholders.

ARCA is using the Securities and Exchange Commission (the SEC) rule that allows companies to furnish their proxy materials over the Internet. As a result, we intend to mail to our stockholders a Notice of Internet Availability of Proxy Materials (the Notice) instead of a paper copy of the proxy materials (including the form of proxy, this Proxy Statement and our Annual Report on Form 10-K for the fiscal year ended December 31, 2014, filed with the SEC on March 19, 2015 (the 2014 Annual Report), collectively, the Proxy Materials) on or about April 24, 2015. We will also provide access to our Proxy Materials over the Internet by April 24, 2015. By furnishing the Notice to our stockholders of record, you ***will not*** receive a printed copy of the Proxy Materials in the mail. Instead, the Notice instructs you on how to access and review all of the important information contained in the Proxy Statement and Annual Report electronically or to receive a printed version in the mail. The Notice also instructs you on how you may submit your proxy over the Internet, by toll-free number or in person at the Annual Meeting. Subsequent to receiving the Notice, all stockholders have the ability to access the Proxy Materials over the Internet and request to receive a paper copy of the Proxy Materials by mail. Instructions on how to access the Proxy Materials over the Internet or to request a paper copy may be found on the Notice. In addition, the Notice contains instructions on how stockholders may request to receive Proxy Materials electronically by e-mail.

All stockholders may view and print ARCA's proxy statement and the 2014 Annual Report, which are available at www.arcabiopharma.com.

QUESTIONS AND ANSWERS ABOUT THESE PROXY MATERIALS AND VOTING

Why did I receive a notice regarding the availability of the Proxy Materials on the Internet?

As described above, pursuant to rules adopted by the SEC, we have elected to provide access to the Proxy Materials over the Internet. Accordingly, on or about April 24, 2015, we expect to send the Notice to ARCA's stockholders of record. The Board of Directors is soliciting your proxy to vote at the Annual Meeting. All stockholders will have the ability to access the Proxy Materials on the website referred to in the Notice or request to receive a printed or electronic set of the Proxy Materials. Instructions on how to access the Proxy Materials over the Internet or to request a printed copy may be found in the Notice.

How do I attend the Annual Meeting?

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The meeting will be held on Thursday, June 4, 2015 at 9:00 a.m. local time at the Renaissance Boulder Flatiron Hotel, 500 Flatiron Boulevard., Broomfield, CO 80021. Directions to the Annual Meeting may be found at www.arcabiopharma.com. Information on how to vote in person at the Annual Meeting is discussed below.

1.

Who can vote at the Annual Meeting?

Only stockholders of record at the close of business on April 6, 2015 will be entitled to vote at the Annual Meeting. On this record date, there were 21,198,411 shares of Common Stock outstanding and entitled to vote.

Stockholder of Record: Shares Registered in Your Name

If, on April 6, 2015, your shares of our Common Stock were registered directly in your name with ARCA's transfer agent, Computershare Trust Company N.A., then you are a stockholder of record. As a stockholder of record, you may vote in person at the meeting or vote by proxy. Whether or not you plan to attend the meeting, we urge you to vote by proxy over the telephone or on the Internet as instructed below or return the proxy card we may mail to you to ensure your vote is counted.

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

If, on April 6, 2015, your shares of our Common Stock were held, not in your name, but rather in an account at a brokerage firm, bank, dealer, or other similar organization, then you are the beneficial owner of shares held in street name and the Notice is being forwarded to you by that organization. The organization holding your account is considered to be the stockholder of record for purposes of voting at the Annual Meeting. As a beneficial owner, you have the right to direct your broker or other agent regarding how to vote the shares in your account. You are also invited to attend the Annual Meeting. However, since you are not the stockholder of record, you may not vote your shares in person at the meeting unless you request and obtain a valid proxy from your broker or other agent.

What am I voting on?

There are three matters scheduled for a vote:

Election of two directors;

Ratification of selection by the Audit Committee of the Board of Directors of KPMG as independent registered public accounting firm of the Company for its fiscal year ending December 31, 2015;

Approval of amendments to the Company's restated certificate of incorporation, as amended, and authorization of the Company's Board of Directors, if in their judgment it is necessary, to select and file one such amendment to effect a reverse stock split of the Company's Common Stock, at a ratio in the range of 3:1 to 20:1, such ratio to be determined at the discretion of the Board of Directors.

What if another matter is properly brought before the meeting?

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

How do I vote?

You may either vote For all the nominees to the Board of Directors or you may Withhold your vote for any nominee you specify. For all other matters to be voted on, you may vote For or Against or abstain from voting. The procedures

for voting are fairly simple:

Stockholder of Record: Shares Registered in Your Name

If you are a stockholder of record, you may vote in person at the Annual Meeting, vote by proxy over the telephone, vote by proxy through the Internet or vote by proxy using a proxy card that you may request or that we may elect to deliver at a later time. Whether or not you plan to attend the meeting, we urge you to vote by proxy to

2.

ensure your vote is counted. You may still attend the meeting and vote in person even if you have already voted by proxy.

To vote in person, come to the Annual Meeting and we will give you a ballot when you arrive.

To vote using the proxy card, simply complete, sign and date the proxy card that may be delivered and return it promptly in the envelope provided. If you return your signed proxy card to us before the Annual Meeting, we will vote your shares as you direct.

To vote over the telephone, dial toll-free **1-800-652-VOTE (8683)** using a touch-tone phone and follow the recorded instructions. You will be asked to provide the company number and control number from the Notice. Your vote must be received by 1:00 a.m. Mountain Time on June 4, 2015 to be counted.

To vote through the Internet, go to **<http://www.investorvote.com/ABIO>** to complete an electronic proxy card. You will be asked to provide the company number and control number from the Notice. Your vote must be received by 1:00 a.m. Mountain Time on June 4, 2015 to be counted.

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

If you are a beneficial owner of shares registered in the name of your broker, bank, or other agent, you should have received a Notice containing voting instructions from that organization rather than from ARCA. Simply follow the voting instructions in the Notice to ensure that your vote is counted. To vote in person at the Annual Meeting, you must obtain a valid proxy from your broker, bank, or other agent. Follow the instructions from your broker or bank included with these proxy materials, or contact your broker or bank to request a proxy form.

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

How many votes do I have?

On each matter to be voted upon, you have one vote for each share of Common Stock you owned as of April 6, 2015.

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

If you return a signed and dated proxy card or otherwise vote without marking voting selections, your shares will be voted, as applicable, For the election of both nominees for director, For the ratification of KMPG as the Company's independent registered public accounting firm for the fiscal year 2015 and For our proposed reverse stock split of the Company's Common Stock at a ratio in the range of 3:1 to 20:1. If any other matter is properly presented at the meeting, your proxy holder (one of the individuals named on your proxy card) will vote your shares using his or her best judgment.

Who is paying for this proxy solicitation?

We will pay for the entire cost of soliciting proxies. In addition to these proxy materials, the directors and employees may also solicit proxies in person, by telephone, or by other means of communication. Directors and employees will not be paid any additional compensation for soliciting proxies. We may also reimburse brokerage firms, banks and other agents for the cost of forwarding proxy materials to beneficial owners.

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

If you receive more than one Notice, your shares may be registered in more than one name or in different accounts. Please follow the voting instructions on each Notice to ensure that all of your shares are voted.

3.

Can I change my vote after submitting my proxy?

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

You may submit another properly completed proxy card with a later date.

You may grant a subsequent proxy by telephone or through the Internet.

You may send a timely written notice that you are revoking your proxy to ARCA's Secretary at 11080 CirclePoint Road, Suite 140, Westminster, Colorado, 80020.

You may attend the Annual Meeting and vote in person. Simply attending the meeting will not, by itself, revoke your proxy.

Your most current proxy card or telephone or internet proxy is the one that is counted.

If your shares are held by your broker or bank as a nominee or agent, you should follow the instructions provided by your broker or bank.

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

To be considered for inclusion in next year's proxy materials, your proposal must be submitted in writing by December 25, 2015, to ARCA's Secretary at 11080 CirclePoint Road, Suite 140, Westminster, Colorado, 80020. If you wish to submit a proposal that is not to be included in next year's proxy materials or nominate a director, you must do so by no earlier than March 6, 2016 and no later than April 5, 2016. You are also advised to review the Company's Bylaws, which contain additional requirements about advance notice of stockholder proposals and director nominations.

How are votes counted?

Votes will be counted by the inspector of election appointed for the meeting. For Proposal 1, to elect new directors, votes For and Withhold will be counted. For Proposals 2 and 3, to approve KMPG as the Company's independent registered public accounting firm for the fiscal year 2015 and the certificates of amendment to the Company's Restated Certificate of Incorporation to effect a reverse stock split of the Company's Common Stock at a ratio in the range of 3:1 to 20:1, votes For and Against, abstentions and broker non-votes will be counted. Abstentions will be counted towards the vote total for Proposals 2 and 3, and will have the same effect as Against votes. Broker non-votes have no effect and will not be counted towards the vote total for any proposal.

What are broker non-votes ?

Broker non-votes occur when a beneficial owner of shares held in street name does not give instructions to the broker or nominee holding the shares as to how to vote. Generally, if shares are held in street name, the beneficial owner of the shares is entitled to give voting instructions to the broker or nominee holding the shares. If the beneficial owner does not provide voting instructions, the broker or nominee can still vote the shares with respect to matters that are considered to be routine, but not with respect to non-routine matters. Under the rules and interpretations of the New

York Stock Exchange (NYSE), non-routine matters are matters that may substantially affect the rights or privileges of shareholders, such as mergers, shareholder proposals and elections of directors, even if not contested.

How many votes are needed to approve each proposal?

Proposal No. 1, for the election of directors. For this proposal, the two nominees receiving the most For votes (from the holders of votes of shares present in person or represented by proxy and entitled to vote on the election of directors) will be elected. Only votes For or Withheld votes will affect the outcome. Broker non-votes will have no effect.

Proposal No. 2, to ratify the selection of KPMG LLP as the Company s independent registered public accounting firm for fiscal year 2015. This proposal must receive For votes from the holders of a majority

4.

of shares present and entitled to vote either in person or by proxy. If you Abstain from voting, it will have the same effect as an Against vote. Broker non-votes will have no effect.

Proposal No. 3, to approve the Amendments to the Company's Restated Certificate of Incorporation, as Amended. The affirmative vote of a majority of the Company's outstanding Common Stock is required to pass this proposal to approve the amendments of the Company's restated certificate of incorporation, as amended, and authorize the Board of Directors, if in their judgment it is necessary, to select and file one such amendment to effect a reverse stock split of the Company's Common Stock at a ratio in the range of 3:1 to 20:1, such ratio to be determined at the discretion of the Board of Directors. Brokerage firms have authority to vote their customers' unvoted shares held by the firms in street name on this proposal. If a broker does not exercise this authority, such broker non-votes, as well as any abstentions, will be treated as votes against this proposal.

What is the quorum requirement?

A quorum of stockholders is necessary to hold a valid meeting. A quorum will be present if stockholders holding a majority of the outstanding shares of Common Stock entitled to vote are present at the meeting in person or represented by proxy. On the record date, April 6, 2015, there were 21,198,411 shares of Common Stock outstanding and entitled to vote. Thus, the holders of 10,599,206 shares of Common Stock must be present in person or represented by proxy at the meeting to have a quorum.

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

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

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

EXPLANATORY NOTE

The Company, a Delaware Corporation formerly known as Nuvelo, Inc., completed a merger transaction on January 27, 2009, with ARCA biopharma, Inc., a Delaware Corporation (ARCA Colorado), in which ARCA Colorado shareholders acquired a majority of the outstanding stock of the Company, and ARCA Colorado became a subsidiary of the Company. The Company then changed its name to ARCA biopharma, Inc. These transactions are referred to herein as the merger. Unless the context otherwise requires or as otherwise stated herein, all references herein to the Company, ARCA, we, us and our refer to ARCA Colorado prior to the completion of the merger and to ARCA biopharma, Inc. following the completion of the merger and the name change, and all references to Nuvelo refer to Nuvelo, Inc. prior to the completion of the merger and the name change.

NO PERSON IS AUTHORIZED TO GIVE ANY INFORMATION OR TO MAKE ANY REPRESENTATION OTHER THAN THOSE CONTAINED IN THIS PROXY STATEMENT, AND, IF GIVEN OR MADE, SUCH INFORMATION MUST NOT BE RELIED UPON AS HAVING BEEN AUTHORIZED. THE DELIVERY OF THIS PROXY STATEMENT SHALL, UNDER NO CIRCUMSTANCES, CREATE ANY IMPLICATION THAT THERE HAS BEEN NO CHANGE IN THE AFFAIRS OF ARCA SINCE THE DATE OF THIS

PROXY STATEMENT.

5.

PROPOSAL 1

ELECTION OF BOARD OF DIRECTORS

The Company's Amended and Restated Certificate of Incorporation provides that the Board of Directors is divided into three classes to provide for staggered terms and that each director will serve for a term of three years or less, depending on the class to which the Board of Directors has assigned a director not previously elected by the stockholders. There are currently no vacancies on the Board. Vacancies on the Board may be filled only by persons elected by a majority of the remaining directors. A director elected by the Board to fill a vacancy in a class, including vacancies created by an increase in the number of directors, shall serve for the remainder of the full term of that class and until the director's successor is duly elected and qualified. The Company may reduce or increase the size of the Board by resolution adopted by the affirmative vote of a majority of the directors.

There are currently two Class II directors whose terms expire at the annual stockholders' meeting in 2017, one Class I director, whose term expires at the annual stockholders' meeting in 2016, and two Class III directors, whose terms expire at the annual stockholders' meeting in 2015. The Board of Directors has nominated two Class III directors, Dr. Raymond L. Woosley and Mr. Dan J. Mitchell, for election to the Board of Directors, each for a three-year term ending on the date of the annual meeting in 2018 or until a successor is duly elected and qualified or appointed.

If elected at the Annual Meeting, each of these nominees would serve until the 2018 annual meeting and until his or her successor has been duly elected and qualified, or, if sooner, until the director's death, resignation or removal. It is the Company's policy to encourage directors and nominees for director to attend the Annual Meeting. Three of the Company's directors then on the Board attended the 2014 Annual Meeting of Stockholders in person, and two attended by telephone.

Directors are elected by a plurality of the votes of the holders of shares present in person or represented by proxy and entitled to vote on the election of directors. The two nominees receiving the highest number of affirmative votes will be elected. Each person nominated for election has agreed to serve if elected. The Company's management has no reason to believe that any nominee will be unable to serve.

Director Qualifications and Diversity

The below paragraphs provide information as of the date of this proxy statement about each nominee and current members of the Board of Directors, including age, all positions currently held, principal occupation and business experience for the past five years. In addition to the information presented regarding each nominee's specific experience, qualifications, attributes and skills that led the Board to conclude that such director or nominee should be able to serve as a director, the Board also believes that all of the directors and nominees have a reputation of integrity, honesty and adherence to high ethical standards. They each have demonstrated business acumen and an ability to exercise sound judgment as well as a commitment to service to ARCA and the Board.

Our Nominating and Corporate Governance Committee considers diversity in the director identification and nomination process. The Nominating and Corporate Governance Committee seeks nominees with a broad diversity of experience, professions, skills, geographic representation and backgrounds. Such Committee does not assign specific weights to particular criteria and no particular criterion is necessarily applicable to all prospective nominees. ARCA believes that the backgrounds and qualifications of the directors, considered as a group, should provide a significant composite mix of experience, knowledge and abilities that will allow the Board to fulfill its responsibilities. Nominees are not discriminated against on the basis of race, religion, national origin, sexual orientation, disability or any other basis proscribed by law.

6.

NOMINEES FOR ELECTION FOR A THREE-YEAR TERM EXPIRING AT THE 2018 ANNUAL MEETING

THE BOARD OF DIRECTORS RECOMMENDS

A VOTE IN FAVOR OF EACH NAMED NOMINEE.

Raymond L. Woosley, M.D., Ph.D.

Dr. Woosley, age 72, was appointed to the ARCA Board of Directors in July 2013. Dr. Woosley is currently the President Emeritus, of the Critical Path Institute (C-Path), a non-profit, public-private partnership with the Federal Food and Drug Administration, of which he was a founder in November 2004, and where he served as President, Chief Executive Officer and Chairman of the Board from 2005 to 2011. Since 2012, Dr. Woosley has also been the Director of CredibleMeds Worldwide, an independent, nonprofit research and education organization. Since 2001, Dr. Woosley has also been a Professor of Medicine and Pharmacology at The University of Arizona Health Sciences Center (UAHSC), and, since 2012, Professor Emeritus, where he was also Vice President for Health Sciences from 2001 to 2005, and Dean of the College of Medicine from 2001 to 2002. From 1988 to 2001, Dr. Woosley was a professor of medicine at the Georgetown University School of Medicine, where he was also Director of the Institute of Cardiovascular Sciences from 1994 to 2000, and Division Chief, Clinical Pharmacology, in the Department of Medicine from 1988 to 1994. Dr. Woosley earned his Ph.D. in Pharmacology from the University of Louisville and his M.D. from the University of Miami. Dr. Woosley's research has been published in over 265 peer-reviewed publications and 50 book chapters. Dr. Woosley is an appropriate member of the Company's Board of Directors, given his expertise and experience in cardiovascular clinical pharmacology, anti-arrhythmic therapeutics, pharmacogenetic drug development and therapeutic regulatory approval.

Dan J. Mitchell

Mr. Mitchell, age 58, was appointed to the ARCA Board of Directors in February 2014. He founded and is a manager of Sequel Venture Partners, L.L.C., a venture capital firm formed in January 1997. Prior to founding Sequel Venture Partners, Mr. Mitchell was a founder of Capital Health Venture Partners, a health care focused venture capital firm, where he was a General Partner from October 1986 until 2006, and he was in the Venture Capital Division of the Trust Department of the First National Bank of Chicago from 1983 to 1985. He currently serves on the board of directors of GlobeImmune, Inc., a publicly traded biopharmaceutical company, and several private companies. Mr. Mitchell holds a B.S. from the University of Illinois and an M.B.A. from the University of California at Berkeley. Mr. Mitchell is an appropriate member of the Company's Board of Directors given his expertise and experience in the pharmaceutical industry, pharmaceutical development, and in corporate finance and governance.

DIRECTOR CONTINUING IN OFFICE UNTIL THE 2016 ANNUAL MEETING

Linda Grais, M.D.

Dr. Grais, age 58, has served as a member of the Company's Board of Directors since the merger with Nuvelo in January 2009. Before the merger, Dr. Grais had served as a director of ARCA Colorado since May 2007. Dr. Grais has been a director of Ocera Therapeutics, Inc., a public biopharmaceutical company, since January 2008 and became President and Chief Executive Officer of Ocera in June 2012. Dr. Grais served as a Managing Member at InterWest Partners, a venture capital firm from May 2005 until February 2011. From July 1998 to July 2003, Dr. Grais was a founder and executive vice president of SGX Pharmaceuticals Inc., a drug discovery company. Prior to that, she was a corporate attorney at Wilson Sonsini Goodrich & Rosati, where she practiced in such areas as venture financings, public offerings and strategic partnerships. Before practicing law, Dr. Grais worked as an assistant clinical professor of Internal Medicine and Critical Care at the University of California, San Francisco. Dr. Grais received a B.A. from Yale University, magna cum laude, and Phi Beta Kappa, an M.D. from Yale Medical School and a J.D. from Stanford

Law School. Dr. Grais is an appropriate member of the Company's Board of Directors because of her diverse training and experience as both a medical doctor and a lawyer, her experience as a founder and senior executive of a pharmaceutical company, and her experience as an investor in new life sciences companies. She also has extensive experience with and knowledge of the Company's business from her service on the Board of ARCA Colorado since 2007, and her service as a Board and Committee member for the Company since January 2009.

7.

DIRECTORS CONTINUING IN OFFICE UNTIL THE 2017 ANNUAL MEETING

Michael R. Bristow, M.D., Ph.D.

Dr. Bristow, age 70, has served as the Company's President and Chief Executive Officer since July 2009. Prior to that time, Dr. Bristow served as the Company's Chief Science and Medical Officer and a director since the merger with Nuvelo. Dr. Bristow was one of the founders of ARCA Colorado in September 2004, and served as its Chairman and Chief Executive Officer from that date until he was appointed to the position of Chief Science and Medical Officer in November 2006. Dr. Bristow is a Professor of Medicine and the former Head of Cardiology at the University of Colorado Health Sciences Center, where he has been since October 1991. Dr. Bristow was one of the founders of Myogen, Inc. and served as Myogen's Chief Science and Medical Officer from October 1996 to February 2006 and as a Scientific Advisor to Myogen from February 2006 until the acquisition of Myogen by Gilead Sciences, Inc. in November 2006. Dr. Bristow is an appropriate member of the Company's Board of Directors given his extensive experience and expertise as a cardiologist, medical researcher and drug developer in the field of cardiovascular medicine, and heart failure specifically, and his experience as a founder and manager of cardiovascular-focused, public pharmaceutical company. Dr. Bristow also has extensive experience with, and knowledge of, ARCA's business, as the founder and former Chief Science and Medical Officer of ARCA Colorado, and the current President and Chief Executive Officer of ARCA, and as a Board member of ARCA Colorado since 2005, and of the Company since January 2009.

Robert E. Conway

Mr. Conway, age 61, was appointed to the ARCA Board of Directors in September 2013. Mr. Conway served as the Chief Executive Officer and member of the Board of Directors of Array Biopharma, a publicly traded pharmaceutical company, from 1999 to 2012. Prior to joining Array, Mr. Conway was the Chief Operating Officer and Executive Vice President of Hill Top Research, Inc., from 1996 to 1999. From 1979 until 1996, Mr. Conway held various executive positions for Corning Inc. including Corporate Vice President and General Manager of Corning Hazleton, Inc., a contract research organization. From 2004 to 2013, he served on the Boards of Directors of PRA International, Inc., which was a public company for a portion of his tenure there, and eResearch Technology, Inc., a private company. Mr. Conway serves as the Chairman of Wall Family Enterprise, a leading library and educational supplies company. In addition, Mr. Conway is a member of the Strategic Advisory Committee of Genstar Capital, LLC. Mr. Conway received a B.S. in accounting from Marquette University in 1976. He is an appropriate nominee to the Company's Board of Directors given his experience and expertise in the pharmaceutical industry, in pharmaceutical development and clinical trials, and in corporate finance, governance, accounting and public company compliance.

INFORMATION REGARDING THE BOARD OF DIRECTORS AND CORPORATE GOVERNANCE

INDEPENDENCE OF THE BOARD OF DIRECTORS

As required under the Nasdaq Stock Market (Nasdaq) listing standards, a majority of the members of a listed company's Board of Directors must qualify as independent, as affirmatively determined by the Board of Directors. The Board consults with the Company's counsel to ensure that the Board's determinations are consistent with relevant securities and other laws and regulations regarding the definition of independent, including those set forth in pertinent listing standards of the Nasdaq, as in effect from time to time.

Consistent with these considerations, after review of all relevant identified transactions or relationships between each director, or any of his or her family members, and the Company, its senior management and its independent registered public accounting firm, the Board has affirmatively determined that the following four directors are independent directors within the meaning of the applicable Nasdaq listing standards: Mr. Conway, Dr. Grais, Mr. Mitchell and Dr. Woosley. In making this determination, the Board found that none of the directors or nominees for director had a

material or other disqualifying relationship with the Company. Dr. Bristow, the

8.

Company's President and Chief Executive Officer is not an independent director by virtue of his relationship with the Company.

BOARD LEADERSHIP STRUCTURE

The Company has structured its Board of Directors in a way that the Company believes effectively serves its objectives of corporate governance and management oversight. The Company separates the roles of CEO and Chairman of the Board in recognition of the differences between the two roles. The Company believes that the CEO should be responsible for the day to day leadership and performance of the Company, while the Chairman of the Board should work with the CEO and the rest of the Board to set the strategic direction for the Company and provide guidance to, and oversight of the CEO. The Chairman also sets the agenda for Board meetings and presides over them.

Mr. Conway, who is an independent director, was elected Chairman of the Board in 2014. In this capacity, Mr. Conway, among other things, calls and presides over Board meetings, including meetings of the independent directors, and sets meeting agendas. In this role, Mr. Conway can effectively coordinate between the Board and management regarding risk management issues and the implementation of appropriate responses, and can help ensure the effective independent functioning of the Board in its oversight responsibilities. Accordingly, the Chairman has substantial ability to shape the work of the Board.

ROLE OF THE BOARD IN RISK OVERSIGHT AND RISK MANAGEMENT

One of the Board's key functions is informed oversight of the Company's risk management process. The Board does not have a standing risk management committee, but rather administers this oversight function directly through the Board as a whole, as well as through various Board standing committees that address risks inherent in their respective areas of oversight. In particular, while the Board is responsible for monitoring and assessing strategic risk exposure, the audit committee has the responsibility to consider and discuss the major financial risk exposures and the steps management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken. The audit committee also monitors compliance with legal and regulatory requirements, in addition to oversight of the performance of ARCA's accounting and financial reporting processes. The nominating and corporate governance committee monitors the effectiveness of the corporate governance guidelines, including whether they are successful in preventing illegal or improper liability-creating conduct. The compensation committee assesses and monitors whether any compensation policies and programs have the potential to encourage excessive risk-taking. The entire Board and its committees address risk management issues from time-to-time and at least annually meet with the employees responsible for risk management in the committees respective areas of oversight. Both the Board as a whole and the various standing committees receive periodic reports from the employees responsible for risk management, as well as incidental reports as matters may arise. It is the responsibility of the committee chairs to report findings regarding material risk exposures to the Board as quickly as possible.

MEETINGS OF THE BOARD OF DIRECTORS

The Board of Directors met six times during the 2014 fiscal year. The independent members of the Board met separately as a group in connection with each of the four regularly scheduled board meetings in 2014.

INFORMATION REGARDING COMMITTEES OF THE BOARD OF DIRECTORS

The Board has three standing committees: an Audit Committee, a Compensation Committee, and a Nominating and Corporate Governance Committee. The following table provides membership and meeting information for fiscal year 2014, for each of the Board committees:

Name	Audit	Compensation	Nominating and Corporate Governance
Dr. Michael R. Bristow			
Dr. Linda Grais (2)	X	X*	X
Dr. Raymond L. Woosley	X	X	X*
Mr. Robert E. Conway	X*	X	
Mr. Dan J. Mitchell (1)	X		X
Total meetings in fiscal 2014	4	5	4

(1) On February 11, 2014, Mr. Mitchell joined the Board.

(2) On February 11, 2014, Ms. Grais resigned from the Audit Committee upon Mr. Mitchell's appointment.

* Current Committee Chairperson.

Below is a description of each committee of the Board of Directors. Each of the committees has authority to engage legal counsel or other experts or consultants, as it deems appropriate to carry out its responsibilities. The Board of Directors has determined that each member of each committee meets the applicable Nasdaq rules and regulations regarding independence and that each member is free of any relationship that would impair his or her individual exercise of independent judgment with regard to the Company.

Audit Committee

The Audit Committee of the Board of Directors was established by the Board in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934, as amended (the Exchange Act), to oversee the Company's corporate accounting and financial reporting processes and audits of its financial statements. For this purpose, the Audit Committee performs several functions. The Audit Committee evaluates the performance of and assesses the qualifications of the independent registered public accounting firm; determines and approves the engagement of the independent registered public accounting firm; determines whether to retain or terminate the existing independent registered public accounting firm or to appoint and engage a new independent registered public accounting firm; reviews and approves the retention of the independent registered public accounting firm to perform any proposed permissible non-audit services; monitors the rotation of partners of the independent registered public accounting firm on the Company's audit engagement team as required by law; reviews and approves or rejects transactions between the company and any related persons; confers with management and the independent registered public accounting firm regarding the effectiveness of internal controls over financial reporting; establishes procedures, as required under applicable law, for the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters and the confidential and anonymous submission by employees of concerns regarding questionable accounting or auditing matters; and meets to review the Company's annual audited financial statements and quarterly financial statements with management and the independent registered public accounting firm, including a review of the Company's disclosures under Management's Discussion and Analysis of Financial Condition and Results of Operations. The Audit Committee is currently composed of three directors: Mr. Conway (chair), Mr. Mitchell and Dr. Woosley. The Audit Committee met four times during the fiscal year. The

Audit Committee has adopted a written charter that is available to stockholders on the Company's website at www.arcabiopharma.com.

The Board of Directors reviews the Nasdaq listing standards definition of independence for Audit Committee members on an annual basis and has determined that all members of the Company's Audit Committee are independent (as independence is currently defined in Rule 5605(c)(2)(A)(i) and (ii) of the Nasdaq listing standards). The Board of Directors has also determined that Mr. Conway qualifies as an audit committee financial expert, as defined in applicable SEC rules. The Board made a qualitative assessment of Mr. Conway's level of

knowledge and experience based on a number of factors, including his prior experience, business acumen and independence.

Report of the Audit Committee of the Board of Directors¹

The Audit Committee has reviewed and discussed the audited financial statements for the fiscal year ended December 31, 2014 with management of the Company. The Audit Committee has discussed with the independent registered public accounting firm the matters required to be discussed by Statement on Auditing Standards No. 61, as amended (AICPA, *Professional Standards*, Vol. 1, AU section 380), as adopted by the Public Company Accounting Oversight Board (PCAOB) in Rule 3200T. The Audit Committee has also received the written disclosures and the letter from the independent registered public accounting firm required by applicable requirements of the PCAOB regarding the independent registered public accounting firm's communications with the audit committee concerning independence, and has discussed with the independent registered public accounting firm the accounting firm's independence. Based on the foregoing, the Audit Committee has recommended to the Board of Directors that the audited financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014.

Mr. Robert Conway

Mr. Dan Mitchell

Dr. Raymond Woosley

Compensation Committee

The Compensation Committee is currently composed of three directors: Mr. Robert Conway, Dr. Linda Grais (chair) and Dr. Raymond Woosley. All members of the Compensation Committee are independent, as independence is currently defined in Rule 5605(a)(2) of the Nasdaq listing standards. The Compensation Committee met five times during the fiscal year. The Compensation Committee has adopted a written charter that is available to stockholders on the Company's website at www.arcabiopharma.com.

The Compensation Committee of the Board of Directors acts on behalf of the Board to review, adopt and oversee the Company's compensation strategy, policies, plans and programs, including:

overseeing succession planning for senior management of the Company, including a review of the performance and advancement potential of current and future senior management and succession plans for each and recommending, as appropriate, the retention of potential succession candidates;

assessing the overall compensation structure of the Company and evaluating and recommending changes to the Company's compensation philosophies and strategies;

reviewing and approving performance-based compensation plans or programs, including establishing goals and targets, applicable to the Chief Executive Officer and other members of the management team;

administering, reviewing, and approving all executive compensation programs or plans, and all of the Company's incentive compensation and stock plans and awards thereunder of the Company, including amendments to the programs, plans or awards made thereunder; and

preparing and approving the Report of the Compensation Committee to be included as part of the Company's annual meeting proxy statement, to the extent required.

- ¹ The material in this report is not soliciting material, is not deemed filed with the Commission and is not to be incorporated by reference in any filing of the Company under the Securities Act of 1933, as amended, or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

Compensation Committee Processes and Procedures

Typically, the Compensation Committee meets on a regular basis as it deems appropriate. The agenda for each meeting is usually developed by the Chair of the Compensation Committee. The Compensation Committee meets regularly in executive session. However, from time to time, various members of management and other employees as well as outside advisors or consultants may be invited by the Compensation Committee to make presentations, to provide financial or other background information or advice or to otherwise participate in Compensation Committee meetings. The Chief Executive Officer may not participate in, or be present during, any deliberations or determinations of the Compensation Committee regarding his compensation or individual performance objectives. The Compensation Committee has the sole authority to retain compensation consultants to assist in its evaluation of executive and director compensation, including the authority to approve the consultant's reasonable fees and other retention terms.

In June 2013, the Company's Compensation Committee reviewed the Company's executive compensation in light of general market conditions in the life science industry. As part of this review process, the Compensation Committee identified a peer group of biotechnology companies that it viewed as having a similar profile to ARCA at that time. This peer group included Alexza Pharmaceuticals, Affymax, Amicus Therapeutics, Inc., Palatin Technologies, Inc., Celsion Corp., NovaBay Pharmaceuticals, Galena Biopharma, Inc., Northwest Biotherapeutics, Inc., and Discovery Laboratories, Inc.

In setting 2014 base salary and cash bonus award amounts for the ARCA Named Executive Officers, the Compensation Committee analyzed the peer group data and targeted cash compensation in the 50th percentile of cash compensation paid to similarly situated executive officers within the peer group. The Board recommended and approved a base salary of \$281,139 for Dr. Bristow, a base salary of \$265,975 for Mr. Wheeler and a base salary of \$274,773 for Mr. Ozeroff for the fiscal year 2014. In early 2015, the Board recommended and approved two percent increases to executive officer salaries for the fiscal year 2015. The Compensation Committee recommended and the Board approved bonuses based on previous performance for the ARCA Named Executive Officers.

Historically, the Compensation Committee has made most of the significant adjustments to annual compensation, determined bonus and equity awards and established new performance objectives at one or more meetings held during the first quarter of the year. However, the Compensation Committee also considers matters related to individual compensation, such as compensation for new executive hires, as well as high-level strategic issues, such as the efficacy of the Company's compensation strategy, potential modifications to that strategy and new trends, plans or approaches to compensation, at various meetings throughout the year. Generally, the Compensation Committee's process comprises two related elements: the determination of compensation levels and the establishment of performance objectives for the current year.

The Committee reviews and approves the compensation of the Chief Executive Officer and the other executive officers of the Company, including annual base salaries, annual and long-term incentive or bonus awards, employment agreements, and severance and change in control agreements/provisions, in each case as, when and if appropriate, and any special or supplemental benefits. For executives other than the Chief Executive Officer, the Compensation Committee solicits and considers evaluations and recommendations submitted to the Committee by the Chief Executive Officer. The Committee evaluates the performance of the Chief Executive Officer in light of Company and individual goals and objectives, and makes appropriate recommendations for improving performance. In performing the evaluation, the Chair of the Committee may solicit comments from the other non-employee members of the Board and lead the Board in an overall review of the Chief Executive Officer's performance in an executive session of non-employee Board members. If the compensation for the Chief Executive Officer or any other executive officer is governed by an employment agreement, the Committee approves such employment agreement and any amendments thereto.

12.

For all executives as part of its deliberations, the Compensation Committee may review and consider, as appropriate, materials such as financial reports and projections, operational data, tax and accounting information, tally sheets that set forth the total compensation that may become payable to executives in various hypothetical scenarios, executive and director stock ownership information, company stock performance data, analyses of historical executive compensation levels and current Company-wide compensation levels.

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee of the Board of Directors is responsible for identifying, reviewing and evaluating candidates to serve as directors of the Company (consistent with criteria approved by the Board), reviewing and evaluating incumbent directors, recommending to the Board candidates for election to the Board of Directors, making recommendations to the Board regarding compensation for Board and Committee service, making recommendations to the Board regarding the membership of the committees of the Board, assessing the performance of the Board and developing a set of corporate governance principles for the Company. The Nominating and Corporate Governance Committee is currently composed of three directors, Dr. Grais, Mr. Mitchell and Dr. Woosley (chair). All members of the Nominating and Corporate Governance Committee in 2014 were independent (as independence is currently defined in Rule 5605(a)(2) of the Nasdaq listing standards). The Nominating and Corporate Governance Committee met four times during the 2014 fiscal year. The Nominating and Corporate Governance Committee has adopted a written charter that is available to stockholders on the Company's website and www.arcabiopharma.com.

The Board has adopted a process for identifying and evaluating director nominees, including stockholder nominees. Before recommending an individual to the Board for Board membership, the Nominating and Corporate Governance Committee canvasses its members and the Company's management team for potential candidates for the Board of Directors. The Nominating and Corporate Governance Committee also uses its network of contacts to identify potential candidates and, if it deems appropriate, may also engage a professional search firm. The Nominating and Corporate Governance Committee will consider stockholders' recommendations for nominees to serve as director if notice is timely received by the Secretary of the Company. Candidates nominated by stockholders will be evaluated in the same manner as other candidates. The Nominating and Corporate Governance Committee keeps the Board apprised of its discussions with potential nominees, and the names of potential nominees received from its current directors, management, and stockholders, if the stockholder notice of nomination is timely made.

Although the Board has not adopted a fixed set of minimum qualifications for candidates for Board membership, the Nominating and Corporate Governance Committee generally considers several factors in its evaluation of a potential member, such as the candidate's education, professional background and field of expertise including industry or academic experience in the pharmaceutical and biotechnology fields, experience in corporate governance and management, the reasonable availability of the potential member to devote time to the affairs of the Company, as well as any other criteria deemed relevant by the Board or the Nominating and Corporate Governance Committee. However, the Nominating and Corporate Governance Committee retains the right to modify these qualifications from time to time. Candidates for director nominees are reviewed in the context of the current composition of the Board, the operating requirements of the Company and the long-term interests of stockholders. In conducting this assessment, the Nominating and Corporate Governance Committee typically considers diversity, age, skills and such other factors as it deems appropriate given the current needs of the Board and the Company, to maintain a balance of knowledge, experience and capability. The Nominating and Corporate Governance Committee believes it is essential that Board members come from a variety of backgrounds and experiences.

In the case of incumbent directors whose terms of office are set to expire, the Nominating and Corporate Governance Committee reviews these directors' overall contributions to the Company and the Board during their terms, including level of attendance, level of participation, quality of performance and contribution to the Board's responsibilities and actions, and any relationships and transactions that might impair the directors' independence. In the case of new

director candidates, the Nominating and Corporate Governance Committee also determines whether the nominee is independent for Nasdaq and SEC purposes, which determination is based upon applicable Nasdaq listing standards, applicable SEC rules and regulations and the advice of counsel, if necessary. The Nominating and Corporate Governance Committee conducts any appropriate and necessary inquiries into the backgrounds and qualifications of possible candidates after considering the function and needs of the Board. The Nominating and

Corporate Governance Committee meets to discuss and consider the candidates' qualifications and then determines whether to recommend a nominee to the Board by majority vote.

Stockholders who wish to recommend individuals for consideration by the Nominating and Corporate Governance Committee to become nominees for election to the Board of Directors may do so by delivering a written recommendation to the Nominating and Corporate Governance Committee addressed to the Corporate Secretary, between 60 and 90 days before the one year anniversary date of ARCA's last Annual Meeting of Stockholders. Recommendations must include the full name of the proposed nominee, a description of the proposed nominee's business experience for at least the previous five years, complete biographical information, a description of the proposed nominee's qualifications as a director, and a representation that the recommending stockholder is a beneficial or record owner of ARCA's stock. Any such submission must be accompanied by the written consent of the proposed nominee to be named as a nominee and to serve as a director if elected. To date, the Nominating and Corporate Governance Committee has not rejected a timely director nominee from a stockholder.

In 2014, the Nominating and Corporate Governance Committee did not pay any fees to assist in the process of identifying or evaluating director candidates.

STOCKHOLDER COMMUNICATIONS WITH THE BOARD OF DIRECTORS

Stockholders who wish to communicate with the Board may do so by e-mail by using the following email address: directors@arcabiopharma.com; or by mail by following the directions as set forth on ARCA's website at www.arcabiopharma.com, under the section titled "Corporate Governance" and the subsection titled "Governance Documents".

CODE OF BUSINESS CONDUCT AND ETHICS

The Company has adopted the ARCA biopharma, Inc. Code of Business Conduct and Ethics that applies to all officers, directors and employees. The Code of Business Conduct and Ethics is available on the Company's website at www.arcabiopharma.com. If the Company makes any substantive amendments to the Code of Business Conduct and Ethics or grants any waiver from a provision of the Code of Business Conduct and Ethics to any executive officer or director, the Company will promptly disclose the nature of the amendment or waiver on its website and file any current report on Form 8-K required by applicable law or Nasdaq listing standards.

PROPOSAL 2**RATIFICATION OF SELECTION OF THE INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

The Audit Committee of the Board of Directors has selected KPMG LLP (KPMG) as the Company s independent registered public accounting firm for the fiscal year ending December 31, 2015 and has further directed that management submit the selection of the independent registered public accounting firm for ratification by the stockholders at the Annual Meeting. KPMG has audited the Company s fiscal year financial statements since 2009. Representatives of KPMG are expected to be present at the Annual Meeting. They will have an opportunity to make a statement if they so desire and will be available to respond to appropriate questions.

Neither the Company s Bylaws nor other governing documents or law require stockholder ratification of the selection of KPMG as the Company s independent registered public accounting firm. However, the Board is submitting the selection of KPMG to the stockholders for ratification as a matter of good corporate practice. If the stockholders fail to ratify the selection, the Audit Committee of the Board will reconsider whether or not to retain that firm. Even if the selection is ratified, the Audit Committee of the Board in its discretion may direct the appointment of a different independent registered public accounting firm 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.

The affirmative vote of the holders of a majority of the shares present in person or represented by proxy and entitled to vote at the Annual Meeting will be required to ratify the selection of KPMG LLP. Broker non-votes are counted towards a quorum, but are not counted for any purpose in determining whether this matter has been approved.

PRINCIPAL ACCOUNTANT FEES AND SERVICES

The following table represents aggregate fees billed, or expected to be billed, to the Company for the fiscal year ended December 31, 2014 and December 31, 2013 by KPMG, the Company s independent registered public accounting firm.

	Fiscal Year Ended 2014	Fiscal Year Ended 2013
Audit Fees (1)	\$ 140,760	\$ 195,080
Audit-related Fees		
Tax Fees		