
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Amendment No. 1
to
FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

ARCH THERAPEUTICS, INC.
(Exact name of registrant as specified in its charter)

Nevada
(State or other jurisdiction of
incorporation or organization)

46-0524102
(I.R.S. Employer
Identification Number)

235 Walnut St., Suite 6
Framingham, MA 01702
(617) 431-2313

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Terrence W. Norchi
President and Chief Executive Officer
235 Walnut St., Suite 6
Framingham, MA 01702
(617) 431-2313

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies of all communications, including communications sent to the agent for service, to:

Michael J. Lerner, Esq.
John D. Hogoboom
Lowenstein Sandler LLP
1251 Avenue of the Americas
New York, New York 10020
Tel: (973) 597-6394

Approximate date of commencement of proposed sale to the public: From time to time after this Registration Statement becomes effective.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer: Accelerated filer:

Non-accelerated filer: (Do not check if a smaller reporting company) Smaller reporting company:

STATEMENT PURSUANT TO RULE 429

The registrant is filing a single prospectus in this registration statement, pursuant to Rule 429 under the Securities Act of 1933. The prospectus is a combined prospectus relating to an aggregate of 2,500,000 shares of common stock, par value \$0.001 per share ("**Common Stock**") that are currently registered and remain unsold under the registrant's registration statement on Form S-1 (File No. 333-194745) (the "**2014 Registration Statement**") declared effective on July 2, 2014 (the "**2014 Registration Statement**") and those same shares of Common Stock, resales of which are being newly registered hereunder. Pursuant to Rule 429, this registration statement constitutes a post-effective amendment to the 2014 Registration Statement with respect to the offerings of such unsold shares thereunder, which are not currently being terminated by the Company. Such post-effective amendment will become effective concurrently with the effectiveness of this registration statement in accordance with Section 8(a) of the Securities Act.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with section 8(a) of the Securities Act of 1933 or until the registration statement shall become effective on such date as the Commission acting pursuant to said section 8(a), may determine.

The information in this prospectus is not complete and may be changed. The selling securityholders named herein may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED NOVEMBER 17, 2016



PROSPECTUS

Up to 2,500,000 Shares of Common Stock

This prospectus relates to the offering and resale by the selling securityholders of Arch Therapeutics, Inc. named herein of up to 2,500,000 shares of common stock, par value \$0.001 per share ("**Common Stock**"). These shares comprise the 2,500,000 shares of issued and outstanding Common Stock currently held by the selling securityholders that were initially issued and sold in a private placement offering that was concluded on February 4, 2014 (the "**2014 Private Placement Financing**"). The Common Stock issued in the 2014 Private Placement Financing was sold as a part of a unit ("**Unit**") consisting of a share of our Common Stock and a Series A Warrant, a Series B Warrant, and a Series C Warrant at a purchase price of \$0.25 per Unit. The Series B and C Warrants expired on January 3, 2015 and July 2, 2016, respectively, and the Series A Warrants issued to the selling securityholders have been completely exercised as of November 17, 2016.

The selling securityholders may sell the shares of Common Stock to be registered hereby from time to time on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, in the over-the-counter market, in one or more transactions otherwise than on these exchanges or systems or in the over-the-counter market, such as privately negotiated transactions, or using a combination of these methods, and at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. See the disclosure under the heading "**PLAN OF DISTRIBUTION**" in this prospectus for more information.

We will not receive any proceeds from the resale of Common Stock by the selling securityholders.

Our common stock is currently quoted on the QB tier of the OTC Marketplace ("**OTCQB**") under the symbol "**ARTH**". On November 16, 2016, the closing price of our common stock was \$0.593 per share.

We originally offered and sold the securities issued in the 2016 Private Placement Financing under an exemption from the registration requirements of the Securities Act of 1933, as amended (the "**Securities Act**"), pursuant to Section 4(a)(2) of the Securities Act and Rule 506(b) promulgated under the Securities Act.

Investing in our securities involves certain risks. See "RISK FACTORS" beginning on Page 6 of this prospectus and in the applicable prospectus supplement for certain risks you should consider. You should read the entire prospectus carefully before you make your investment decision.

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

The date of this prospectus is _____, 2016

TABLE OF CONTENTS

| | Page |
|--|-------------|
| <u>ABOUT THIS PROSPECTUS</u> | 1 |
| <u>FORWARD-LOOKING STATEMENTS</u> | 1 |
| <u>PROSPECTUS SUMMARY</u> | 1 |
| <u>RISK FACTORS</u> | 6 |
| <u>USE OF PROCEEDS</u> | 6 |
| <u>DETERMINATION OF OFFERING PRICE</u> | 6 |
| <u>SELLING SECURITYHOLDERS</u> | 6 |
| <u>DESCRIPTION OF SECURITIES</u> | 8 |
| <u>PLAN OF DISTRIBUTION</u> | 10 |
| <u>LEGAL MATTERS</u> | 12 |
| <u>EXPERTS</u> | 12 |
| <u>WHERE YOU CAN FIND MORE INFORMATION</u> | 12 |

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission (the “SEC”) utilizing a “shelf” registration process. Under this shelf registration process, the selling securityholders may, from time to time, offer and sell shares of our Common Stock, as described in this prospectus, in one or more offerings. To the extent we file any prospectus supplements, such prospectus supplements may add, update or change information contained in this prospectus to the extent permitted by the Securities Act. You should read both this prospectus and any prospectus supplement together with additional information described under the heading “WHERE YOU CAN FIND MORE INFORMATION.”

We and the selling securityholders have not authorized anyone to provide any information other than that contained or incorporated by reference in this prospectus or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. The selling securityholders are offering to sell, and seeking offers to buy, these securities only in jurisdictions where offers and sales are permitted. You should not assume that the information contained in or incorporated by reference in this prospectus or any prospectus supplement is accurate as of any date other than their respective dates.

FORWARD-LOOKING STATEMENTS

This prospectus, including the documents incorporated by reference herein, contains forward-looking statements. In some cases, you can identify these statements by forward-looking words such as “may,” “might,” “will,” “should,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “predicts,” “potential” or “continue,” the negative or plural of these words and other comparable terminology. These forward-looking statements, which are subject to risks, uncertainties and assumptions about us, may include projections of our future financial performance, our anticipated growth strategies and anticipated trends in our business. These statements are only predictions based on our current expectations and projections about future events. There are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from the results, level of activity, performance or achievements expressed or implied by the forward-looking statements, including those factors discussed under the caption entitled “Risk Factors” in our Annual Report on Form 10-K for the year ended September 30, 2015.

Although we believe the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, level of activity, performance or achievements. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of any of these forward-looking statements. We are under no duty to update any of these forward-looking statements after the date of this prospectus to conform our prior statements to actual results or revised expectations.

PROSPECTUS SUMMARY

Our Company

We are a biotechnology company in the development stage with limited operations to date. We aim to develop products that make surgery and interventional care faster and safer by using a novel approach that stops bleeding (referenced as “**hemostatic**” or “**hemostasis**”), controls leaking (referenced as “**sealant**” or “**sealing**”), and provides other advantages during surgery and trauma care. Our core technology is based on a self-assembling peptide that creates a physical, mechanical barrier, which could be applied to seal organs or wounds that are leaking blood and other fluids. We believe our technology could support an innovative platform of potential products in the field of stasis and barrier applications. Our lead product candidate, the AC5 Surgical Hemostatic Device™ (which we sometimes refer to as “**AC5™**”), is designed to achieve hemostasis in minimally invasive and open surgical procedures, and we hope to develop other hemostatic or sealant product candidates in the future based on our self-assembling peptide technology platform. Our plan and business model is to develop products that apply that core technology to use with human bodily fluids and connective tissues.

AC5 is designed to be a biocompatible synthetic peptide comprising naturally occurring amino acids. When applied to a wound, AC5 intercalates into the interstices of the connective tissue where it self-assembles into a physical, mechanical structure that provides a barrier to leaking substances, such as blood. AC5 is designed for direct application as a liquid, which we believe will make it user-friendly and able to conform to irregular wound geometry. Additionally, AC5 is not sticky or glue-like, which we believe will enhance its utility in the setting of minimally invasive and laparoscopic surgeries. Further, in certain settings, AC5 lends itself to a concept that we call Crystal Clear Surgery™ because the transparency and physical properties of AC5 enable a surgeon to operate through it in order to maintain a clearer field of vision and prophylactically stop or lessen bleeding as it starts.

Corporate Information

We were incorporated under the laws of State of Nevada on September 16, 2009 as Almah, Inc. On May 10, 2013, we entered into an Agreement and Plan of Merger (the “**Merger Agreement**”) with Arch Biosurgery, Inc., a private Massachusetts corporation (“**ABS**”), and Arch Acquisition Corporation, our wholly owned subsidiary formed for the purpose of the transaction, pursuant to which Arch Acquisition Corporation merged with and into ABS and ABS thereby became our wholly owned subsidiary (the “**Merger**”). The Merger closed on June 26, 2013. In contemplation of the Merger, we changed our name from Almah, Inc. to Arch Therapeutics, Inc. Our principal executive offices are located at 235 Walnut St., Suite 6, Framingham, Massachusetts 01702. The telephone number of our principal executive offices is (617) 431-2313. Our website address is <http://www.archtherapeutics.com>. We have not incorporated by reference into this prospectus the information on our website, and you should not consider it to be a part of this document.

2014 Private Placement Financing

On January 30, 2014, we entered into a securities purchase agreement (the “**2014 SPA**”) with 9 accredited investors (the “**2014 Investors**”) providing for the issuance and sale by us to such 2014 Investors, in a private placement, of an aggregate of 11,400,000 Units at a purchase price of \$0.25 per Unit, for aggregate gross proceeds to us of \$2.85 million (the “**2014 Private Placement Financing**”). Each Unit consisted of a share of our Common Stock and a Series A Warrant, a Series B Warrant, and a Series C Warrant (collectively, the “**2014 Warrants**”), each of which was exercisable for a share of Common Stock. Upon the closing of the 2014 Private Placement Financing on February 4, 2014, we issued to the 2014 Investors 11,400,000 shares of Common Stock and 2014 Warrants exercisable up to an aggregate of 34,200,000 shares of our Common Stock. As noted above, the Series B and C Warrants expired on January 3, 2015 and July 2, 2016, respectively.

The Series A Warrants had an initial exercise price of \$0.30 per share, were exercisable immediately upon their issuance and have a term of exercise equal to five years after their issuance date. The number of shares of our Common Stock into which each Series A Warrant is exercisable and the exercise price therefor were subject to adjustment as set forth in the Series A Warrant, including, without limitation, adjustments in the event of certain subsequent issuances and sales of shares of our Common Stock (or securities convertible or exercisable into shares of our Common Stock) at a price per share lower than the then-effective exercise price of the Series A Warrant, in which case the per share exercise price of the Series A Warrant would be adjusted to equal such lower price per share and the number of shares issuable upon exercise of the Series A Warrants would be adjusted accordingly so that the aggregate exercise price upon full exercise of the Series A Warrants immediately before and immediately after such per share exercise price adjustment were equal (the “**Anti-Dilution Provisions**”), as well as customary adjustments in the event of stock dividends and splits, subsequent rights offerings and pro rata distributions to our Common Stockholders. The Series A Warrants also provide that they shall not be exercisable in the event and to the extent that the exercise thereof would result in the holder of a Series A Warrant or any of its affiliates beneficially owning more than 4.9% of our Common Stock.

Between March 11, 2015 and through March 13, 2015, we entered into substantially similar subscription agreements with three of the 2014 Investors (the “**Convertible Notes Investors**”) pursuant to which we issued unsecured 2016 8% Convertible Notes (the “**Convertible Notes**”, and such transaction, the “**Notes Offering**”) to the Convertible Notes Investors in the aggregate principal amount of \$750,000. Because the conversion price of the Convertible Notes on the date the Notes Offering closed (\$0.20 per share) was below the then current exercise price of the Series A Warrants, the issuance of the Convertible Notes triggered the Anti-Dilution Provisions of the Series A Warrants and, as a result, the exercise price of the Series A Warrants was reduced to \$0.20 per share and the aggregate number of shares issuable under the Series A Warrants increased by 5,700,000 shares (such additional shares, the “**Anti-Dilution Shares**”) from 11,400,000 shares to 17,100,000 shares, in each case effective as of March 13, 2015. As of November 16, 2016, there are currently 25,000 Anti-Dilution Shares outstanding.

On June 22, 2015, we entered into an amendment agreement with Cranshire Capital Master Fund, Ltd. (“**Cranshire**”), the lead investor in the 2014 Private Placement Financing, pursuant to which to the Anti-Dilution Provisions contained in the Series A Warrants and Series C Warrants were removed in consideration for (a) extending the expiration date of the Series C Warrants to 5:00 p.m., New York time, on July 2, 2016; and (b) agreeing to issue the holders of the Series A Warrants and Series C Warrants up to an additional 570,000 shares of Common Stock (the “**Inducement Shares**”), subject to the delivery by each such holder of an investor certificate.

Upon the closing of the 2014 Private Placement Financing, we entered into a registration rights agreement with the 2014 Investors (the “**2014 Registration Rights Agreement**”), pursuant to which we became obligated, subject to certain conditions, to file with the SEC one or more registration statements to register the shares of Common Stock issued in and underlying the 2014 Warrants issued in the 2014 Private Placement Financing for resale under the Securities Act. As a result, we initially registered for resale under a registration statement on Form S-1 (File Number 333-194745, and such registration statement, the “**2014 Registration Statement**”) an aggregate of 45,600,000 shares of Common Stock, representing the (i) 11,400,000 shares issued at the closing of the 2014 Private Placement Financing and (ii) 34,200,000 shares underlying the 2014 Warrants issued upon the closing of the 2014 Private Placement Financing.

The 2014 Registration Rights Agreement also obligates us to register the resale of all securities covered by the 2014 Registration Rights Agreement on a short-form registration statement on Form S-3 as soon as we become eligible to use Form S-3; *provided, however* that we are required to maintain the effectiveness of all registration statements, including the 2014 Registration Statement, then in effect and the availability for use of each prospectus contained therein until such time as a registration statement on Form S-3 covering the resale of such shares has been declared effective by the SEC and the prospectus contained therein is available for use or, if earlier, such time as a registration statement is no longer required to be maintained by us. This registration statement on Form S-3 (the “**2016 S-3 Registration Statement**”) and together with the 2014 Registration Statement, the “**Registration Statements**”) is being filed to satisfy this obligation.

Our failure to satisfy certain deadlines with respect to the Registration Statements and certain other requirements set forth in the 2014 Registration Rights Agreement may require us to pay monetary penalties to the 2014 Investors and/or their assignees. Additionally, we may be required in the future to amend the Registration Statements or to file new registration statements in order to register additional shares of our Common Stock for resale by the investors in the 2014 Private Placement Financing to account for adjustments to the number of shares underlying the 2014 Warrants including, but not limited to, the remaining 25,000 Anti-Dilution Shares that became exercisable under the Series A Warrants as a result of the Notes Offering; *provided, however*, that pursuant to comments received from the staff of the SEC (the “**Staff**”), we will not be permitted to amend the Registration Statements or file a new registration statement to cover such additional shares until 60 days after substantially all the shares registered under the Registration Statements have been sold.

Under the 2014 Registration Rights Agreement, subject to exception in certain circumstances, we have agreed to keep the at least one of the Registration Statements effective until the earlier of the date on which all shares of Common Stock to be registered thereunder have been sold or may be sold without restriction pursuant to Rule 144 promulgated under the Securities Act (“**Rule 144**”). If there is not, at any time during the period required by the 2014 Registration Rights Agreement, an effective registration statement covering the resale of any of the shares issued in or issuable upon exercise of the 2014 Warrants issued in the 2014 Private Placement Financing, then the investors in the 2014 Private Placement Financing or their assignees (i) will have “piggyback” registration rights with respect to any such shares that are not eligible for resale pursuant to Rule 144 in connection with any other registration statement we determine to file that would permit the inclusion of those shares; and (ii) will be entitled to exercise their 2014 Warrants on a “cashless exercise” or “net exercise” basis during the period when the shares issuable upon exercise of such 2014 Warrants are not so registered.

On January 30, 2014, the date of our entry into the 2014 SPA, the Series A Warrants and Series B Warrants had an exercise price lower than the market value of our Common Stock, which closed at \$0.38 on the OTCQB on such date, resulting in an aggregate discount to the market price of our Common Stock of \$912,000 for the Series A Warrants and \$342,000 for the Series B Warrants as of such date. The Series C Warrants were issued with an exercise price higher than the market value of our Common Stock on the date of our entry into the 2014 SPA, and therefore did not have any discount to the market price of our Common Stock as of such date. The table below indicates the total possible discount to the market price of our Common Stock as of January 30, 2014 for the shares of our Common Stock underlying the Series A Warrants. The last trading price of our Common Stock on the OTCQB on February 4, 2014, the date of the closing of the 2014 Private Placement Financing, was \$0.30. As a result, as of such date, there was no discount to the market price of our Common Stock for any of the 2014 Warrants.

Series A Warrants

| | | |
|---|----|------------|
| Market price per share of our Common Stock on January 30, 2014, the date of the Securities Purchase Agreement: | \$ | 0.38 |
| Exercise price per share of the Series A Warrants on the date of issuance: | \$ | 0.30 |
| Total possible shares of Common Stock underlying the Series A Warrants on the date of issuance: | | 11,400,000 |
| Aggregate market price of all shares of Common Stock underlying the Series A Warrants on the date of issuance, based on the market price of our Common Stock on January 30, 2014: | \$ | 4,332,000 |
| Aggregate exercise price of all shares of Common Stock underlying the Series A Warrants on the date of issuance, based on the exercise price on the date of issuance: | \$ | 3,420,000 |
| Total possible discount of the exercise price of the Series A Warrants to the market price of our Common Stock as of January 30, 2014: | \$ | 912,000 |

As noted above, as a result of the closing of the Notes Offering on March 13, 2015 and the Anti-Dilution Provisions of the Series A Warrants, the exercise price of the Series A Warrants was reduced to \$0.20 per share and the aggregate number of shares issuable under the Series A Warrants increased by 5,700,000 shares (or fifty-percent (50%)) from 11,400,000 shares to 17,100,000 shares, in each case effective as of March 13, 2015. As a result, the Series A Warrants had an exercise price lower than the market value of our Common Stock on March 13, 2015, which closed at \$0.21 on the OTCQB on such date, resulting in an aggregate discount to the market price of our Common Stock of \$171,000 for the Series A Warrants as of such date. The table below indicates the total possible discount to the market price of our Common Stock as of March 13, 2015 for the shares of our Common Stock underlying the Series A Warrants.

Series A Warrants

| | | |
|---|----|------------|
| Market price per share of our Common Stock on March 13, 2015, the date the Note Offering closed: | \$ | 0.21 |
| Exercise price per share of the Series A Warrants on the date the Note Offering closed: | \$ | 0.20 |
| Total possible shares of Common Stock underlying the Series A Warrants on the date the Note Offering closed: | | 17,100,000 |
| Aggregate market price of all shares of Common Stock underlying the Series A Warrants on the date the Note Offering closed, based on the market price of our Common Stock on March 13, 2015: | \$ | 3,591,000 |
| Aggregate exercise price of all shares of Common Stock underlying the Series A Warrants on the date the Note Offering closed, based on the exercise price on the date of the date the Note Offering closed: | \$ | 3,420,000 |
| Total possible discount of the exercise price of the Series A Warrants to the market price of our Common Stock as of March 13, 2015: | \$ | 171,000 |

We did not engage any underwriter or placement agent in connection with the 2014 Private Placement Financing. We also did not make any payments, in cash or equity, to any of the selling securityholders in connection with the 2014 Private Placement Financing, except that we have reimbursed Cranshire an aggregate cash amount of up to \$35,000 for costs and expenses incurred by it or its affiliates in connection with the transactions contemplated by the 2014 Private Placement Financing and the registration of the securities issued in the 2014 Private Placement Financing.

After deducting for the expense reimbursement to Cranshire, the net proceeds to us from the 2014 Private Placement Financing on the date it closed were approximately \$2.815 million. The table below describes in more detail these costs associated with the 2014 Private Placement Financing as of the date it closed:

| | | |
|---|----|--------------|
| Gross proceeds of the 2014 Private Placement Financing: | \$ | 2,850,000(1) |
| Total potential payment to Cranshire as expense reimbursement: | \$ | 35,000(2) |
| Resulting net proceeds to the Company: | \$ | 2,815,000(3) |
| Total possible profit to be realized by the selling securityholders as a result of any exercise discounts underlying the Series A Warrants: | \$ | 912,000(4) |

- (1) Does not include (i) \$5,360,000 in gross proceeds paid to us upon the exercise of Series A Warrants (17,075,000 shares, 5,675,000 that were exercised on a cashless basis), Series B Warrants (4,000,000 shares), and Series C Warrants (11,400,000 shares) that occurred on or prior to November 16, 2016; and (ii) potential gross proceeds payable to us upon exercise of the remaining 25,000 Anti-Dilution Shares, which would equal approximately \$5,000 if all such Anti-Dilution Shares were exercised on a cash basis.
- (2) This amount includes \$25,000 that was withheld from the purchase price paid to us by Cranshire for the securities it purchased in the 2014 Private Placement Financing, and up to \$10,000 that we agreed to pay to Cranshire as additional expense reimbursement. This amount does not include our fees and expenses associated with the 2014 Private Placement Financing, including our legal fees and registration fees, were estimated to total \$228,047. This amount also does not include additional payments that we may be required to make under certain circumstances but that are not currently determinable, including the following: (a) potential partial damages for failure to register and keep registered for the period specified in the 2014 Registration Rights Agreement the Common Stock issued in the 2014 Private Placement Financing or issuable upon exercise of the 2014 Warrants (in a cash amount equal to 1% of the price paid to us by each investor in the 2014 Private Placement Financing on the date of and on each 30-day anniversary of such failure until the cure thereof, with no quantitative cap to the aggregate amount of such payments (provided that no such payments will be owed, other than with respect to a suspension or delisting of our Common Stock from the OTCQB, with respect to any period during which an investor's Registrable Securities may all be sold without restriction under Rule 144)); (b) amounts payable if we or our transfer agent fails to timely remove certain restrictive legends from certificates representing shares of Common Stock issued in the 2014 Private Placement Financing or issuable upon exercise of the 2014 Warrants; and (c) payments in respect of claims for which we provide indemnification in the Securities Purchase Agreement and the 2014 Registration Rights Agreement. Although we intend to comply with the requirements of the Securities Purchase Agreement and the 2014 Registration Rights Agreement and do not currently expect to make any such payments, it is possible that such payments may be required.
- (3) Calculated by subtracting the total possible and currently determinable cash payments to selling securityholders or their affiliates from the gross proceeds to us from the 2014 Private Placement Financing.
- (4) Calculated by adding the total possible discount of the exercise prices of the Series A Warrants the market price of our Common Stock as of January 30, 2014, as reflected in the table set forth above. Does not include the additional the additional \$171,000 in exercise discounts underlying the Series A Warrants resulting from the closing of the Notes Offering.

The Offering

This prospectus relates to the resale from time to time by the selling securityholders identified in this prospectus of up to 2,500,000 shares of our Common Stock issued or underlying the Series A Warrants issued in the 2014 Private Placement Financing. None of the shares to be registered hereby are being offered for sale by us.

| | |
|---|-----------------|
| Common Stock outstanding prior to November 17, 2016 | 137,857,075 (1) |
|---|-----------------|

| | |
|---|---------------|
| Common Stock offered by the selling securityholders | 2,500,000 (2) |
|---|---------------|

| | |
|---|-----------------|
| Common Stock to be outstanding after the offering | 137,857,075 (3) |
|---|-----------------|

| | |
|-----------------|--|
| Use of proceeds | We will not receive any proceeds from the sale of Common Stock offered by the selling securityholders under this prospectus. |
|-----------------|--|

| | |
|--------------|--------|
| OTCQB symbol | “ARTH” |
|--------------|--------|

| | |
|--------------|--|
| Risk Factors | See “ RISK FACTORS ” beginning on Page 6 and other information in this prospectus for a discussion of the factors you should consider before you decide to invest in our Common Stock and warrants. |
|--------------|--|

- (1) As of November 16, 2016, includes an aggregate of 2,500,000 shares of our Common Stock issued to the selling securityholders in connection with the 2014 Private Placement Financing. Includes 21,418,383 shares of Common Stock held by our affiliates.
- (2) Consists of the 2,500,000 shares of Common Stock currently held by the selling securityholders that were originally issued in connection with the closing of the 2014 Private Placement Financing.

- (3) Excludes (i) 17,826,741 shares of Common Stock that are reserved for future issuance under our 2013 Stock Incentive Plan (the “**2013 Plan**”), of which 12,479,214 shares are subject to outstanding option awards granted under the 2013 Plan at exercise prices ranging from \$0.17 to \$0.72 per share and with a weighted average exercise price of \$0.33 per share; (ii) 145,985 shares of Common Stock issuable upon the exercise of outstanding warrants issued in connection with the Life Sciences Accelerator Funding Agreement that we entered into with the Massachusetts Life Sciences Center (“**MLSC**”) on September 30, 2013 and amended on September 28, 2016 (as amended, the “**MLSC Loan Agreement**”), with an exercise price of \$0.274 per share (the “**MLSC Warrant**”), none of which are being registered pursuant to the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 10,951,663 shares of Common Stock issuable upon the exercise of the Series D Warrants originally issued in the Company’s private placement financing that concluded on July 2, 2015 (the “**2015 Private Placement Financing**”), none of which are being registered pursuant to the 2016 S-3 Registration Statement of which this prospectus forms a part; and (iv) 6,258,323 shares of Common Stock issuable upon the exercise of the Series E Warrants originally issued in the Company’s private placement financing that concluded on May 26, 2016 (the “**2016 Private Placement Financing**”), none of which are being registered pursuant to the 2016 S-3 Registration Statement of which this prospectus forms a part.

RISK FACTORS

You should carefully consider all of the information in this prospectus and, in particular, you should evaluate the specific risk factors incorporated by reference herein and included or incorporated by reference in any applicable prospectus supplement.

USE OF PROCEEDS

We will not receive proceeds from the sale of Common Stock under this prospectus. We will, however, receive approximately \$220,000 from the selling securityholders if they exercise all of the Series A Warrants on a cash basis (assuming, in each case, no adjustments are made to the exercise price or number of shares issuable upon exercise of the Series A Warrants), which we expect we would use primarily for working capital purposes. We also expect we may use a portion of any such proceeds we may receive to satisfy our indebtedness to MLSC. In particular, pursuant to the Life MLSC Loan Agreement, we are required to amortize the principal and accrued interest under the MLSC Loan Agreement by making 13 monthly payments of approximately \$106,022 each to MLSC commencing on October 3, 2016. In addition, the remaining principal and accrued interest under the MLSC Loan Agreement will become immediately due and payable on the earlier of (i) the completion of a sale of substantially all of our assets, a change-of-control transaction or one or more financing transactions in which we receive net proceeds of \$5,000,000 at any time after October 3, 2016; and (ii) the occurrence of an event of default by us under the MLSC Loan Agreement.

DETERMINATION OF OFFERING PRICE

The selling securityholders will determine at what price they may sell the shares of Common Stock offered by this prospectus, and such sales may be made at prevailing market prices, at prices related to the prevailing market price or at privately negotiated prices.

SELLING SECURITYHOLDERS

This prospectus covers the resale from time to time by the selling securityholders identified in the table below of up to an aggregate of 2,500,000 shares of our Common Stock that were issued in the 2014 Private Placement Financing, and that remained outstanding as of November 16, 2016. For additional information regarding the issuance of the shares of Common Stock and the Series A Warrants, see the description under “**PROSPECTUS SUMMARY | 2014 PRIVATE PLACEMENT FINANCING**” elsewhere in this prospectus.

We are registering the shares of Common Stock hereby pursuant to the terms of the 2014 Registration Rights Agreement among us and the 2014 Investors in order to permit the selling securityholders identified in the table below to offer the shares for resale from time to time.

The table below (i) lists the selling securityholders and other information regarding the beneficial ownership and the rules and regulations thereunder) of our Common Stock by each of the selling securityholders (including securities issued in transactions unrelated to the 2014 Private Placement Financing, if any); (ii) has been prepared based upon information furnished to us by the selling securityholders; and, (iii) to our knowledge, is accurate as of the date of this prospectus. The selling securityholders may sell all, some or none of their shares in this offering. See the disclosure under the heading “**PLAN OF DISTRIBUTION**” elsewhere in this prospectus. The selling securityholders identified in the table below may have sold, transferred or otherwise disposed of some or all of their shares since the date of this prospectus in transactions exempt from or not subject to the registration requirements of the Securities Act. Information concerning the selling securityholders may change from time to time and, if necessary, we will amend or supplement this prospectus accordingly and as required.

| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 | Column 6 |
|--|---|---|--|--|--|
| Name of Selling Securityholder | Number of Shares of Common Stock Issued and Issuable (1) | Number of Shares of Common Stock Beneficially Owned Prior to this Offering (2) | Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus (3) | Number of Shares of Common Stock Beneficially Owned After This Offering (4) | Percentage of Shares of Common Stock Beneficially Owned After This Offering (5) |
| Heng Hong Ltd (5) | 2,205,000 | 2,205,000 | 2,100,000 | 105,000 | 0.08% |
| Ocean Creation Investments Limited (6) | 210,000 | 210,000 | 200,000 | 10,000 | 0.01% |
| Karmdeep & Harpreet Bains (7) | 210,000 | 210,000 | 200,000 | 10,000 | 0.01% |
| Total | 2,625,000 | 2,625,000 | 2,500,000 | 125,000 | 0.09% |

- (1) Reflects the total number of shares of Common Stock held or issuable to each selling securityholder including, to the extent applicable, all other securities issued in transactions unrelated to the 2014 Private Placement Financing, if any, none of which are being registered in this 2016 S-3 Registration Statement of which this prospectus forms a part and in each case without regard to any ownership limitations upon the exercise or conversion of such securities.
- (2) For each selling securityholder, the totals reported in this column reflect the total number of shares of Common Stock registered for resale under the 2016 S-3 Registration Statement of which this prospectus forms a part.
- (3) For each selling securityholder and to the extent applicable, the totals reported in this column assume that (a) all of the shares of Common Stock to be registered by the 2016 S-3 Registration Statement of which this prospectus forms a part, including the shares of Common Stock held by such selling securityholder that were issued in connection with the closing of the 2014 Private Placement Financing are sold in this offering; (b) the selling securityholders do not sell, to the extent applicable, any of the securities that have been issued to them in transactions unrelated to the 2014 Private Placement Financing and included in Column 2; and (c) the selling securityholders do not acquire additional shares of our Common Stock after November 16, 2016 and prior to completion of this offering.
- (4) Percentage ownership for each selling securityholder is determined in accordance with Section 13(d) of the Exchange Act of 1934, as amended (the “**Exchange Act**”), and is based on 137,857,075 outstanding shares of our Common Stock as of November 16, 2016.
- (5) Daniel MacMullin, in his capacity as the Managing Partner of Heng Hong Ltd (“**Heng Hong**”), has investment discretion and voting power over the shares held by Heng Hong. As a result, Mr. MacMullin may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities held by Heng Hong that are covered hereunder. Mr. MacMullin disclaims any such beneficial ownership of such securities.

Mr. MacMullin and Heng Hong may be deemed to have beneficial of 2,205,000 shares of Common Stock, which consists of the following: (i) 2,100,000 shares of Common Stock issued to Heng Hong in the 2014 Private Placement Financing; and (ii) 105,000 Inducement Shares issued to Heng Hong, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part.

- (6) Norman Winata, in his capacity as the Managing Member of Ocean Creation Investments Limited, has investment discretion and voting power over the shares held by Ocean Creation Investments Limited (“**OCIL**”). As a result, Mr. Winata may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities held by OCIL that are covered hereunder. Mr. Winata disclaims any such beneficial ownership of such securities.

Mr. Winata and OCIL may be deemed to have beneficial ownership of 210,000 shares of Common Stock, which consists of the following: (i) 200,000 shares of Common Stock issued to OCIL in the 2014 Private Placement Financing; and (ii) 10,000 Inducement Shares issued to OCIL, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part.

- (7) Mr. and Ms Bains may be deemed to have beneficial ownership of 210,000 shares of Common Stock, which consists of the following: (i) 200,000 shares of Common Stock issued to Mr. and Ms. Bains in the 2014 Private Placement Financing; and (ii) 10,000 Inducement Shares issued to Mr. and Ms. Bains, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part.

Except for the ownership of the Common Stock, 2014 Warrants issued in the 2014 Private Placement Financing and as otherwise described in the table above and this “Selling Securityholder” section, (a) we have not made, and are not required to make, any potential payments regarding the 2014 Private Placement Financing to any selling securityholder, any affiliate of a selling securityholder, or any person with whom any selling securityholder has a contractual relationship, and (b) none of the selling securityholders has, or has had within the past

three years, any material relationship with us or any of our predecessors or affiliates. Additionally, none of the selling securityholders holds any of our securities, other than those issued in the 2014 Private Placement Financing, that have been registered under the Securities Act or that are entitled to registration rights thereunder. We have also been advised that none of the selling securityholders is a broker-dealer or an affiliate of a broker-dealer.

We have made no payments, in cash or equity, to any of the selling securityholders in connection with this offering, except that we have reimbursed Cranshire an aggregate cash amount of up to \$35,000 for costs and expenses incurred by it or its affiliates in connection with the transactions contemplated by the 2014 Private Placement Financing and the registration of the securities being registered hereby. Additionally, we may be required to make certain payments to the investors in the 2014 Private Placement Financing under certain circumstances in the future pursuant to the terms of the 2014 SPA and the 2014 Registration Rights Agreement. These potential future payments include the following: (a) potential partial damages for failure to register and keep registered for the period specified in the 2014 Registration Rights Agreement the Common Stock issued in the 2014 Private Placement Financing or issuable upon exercise of the Warrants (in a cash amount equal to 1% of the price paid to us by each investor in the 2014 Private Placement Financing on the date of and on each 30-day anniversary of such failure until the cure thereof, with no quantitative cap to the aggregate amount of such payments (provided that no such payments will be owed, other than with respect to a suspension or delisting of our Common Stock from the OTCQB, with respect to any period during which an investor's Registrable Securities may all be sold without restriction under Rule 144)); (b) amounts payable if we or our transfer agent fails to timely remove certain restrictive legends from certificates representing shares of Common Stock issued in the 2014 Private Placement Financing or issuable upon exercise of the 2014 Warrants; and (c) payments in respect of claims for which we provide indemnification in the 2014 SPA and the 2014 Registration Rights Agreement. Although we intend to comply with the requirements of the 2014 SPA and the 2014 Registration Rights Agreement and do not currently expect to make any such payments, it is possible that such payments may be required.

DESCRIPTION OF SECURITIES

General

Effective May 24, 2013, we amended our Articles of Incorporation to increase our authorized Common Stock from 75,000,000 shares to 300,000,000 shares. Other than our Common Stock, we have no other class or series of authorized capital stock.

As of November 16, 2016, we had 137,857,075 shares of Common Stock issued and outstanding. Of our issued and outstanding shares of Common Stock, we are registering under the registration statement, of which this prospectus forms a part, 2,500,000 shares of Common Stock that were issued in connection with the 2014 Private Placement Financing and outstanding as of November 16, 2016.

The additional shares of our authorized stock available for issuance may be issued at times and under circumstances so as to have a dilutive effect on earnings per share and on the equity ownership of the holders of our Common Stock. The ability of our Board to issue additional shares of stock could enhance the Board's ability to negotiate on behalf of the stockholders in a takeover situation but could also be used by the Board to make a change-in-control more difficult, thereby denying stockholders the potential to sell their shares at a premium and entrenching current management. The following description is a summary of the material provisions of our capital stock. You should refer to our articles of incorporation, as amended, and bylaws, both of which are on file with the SEC as exhibits to previous SEC filings, for additional information. The summary below is qualified by provisions of applicable law.

Common Stock

The holders of our Common Stock, par value \$0.001 per share, are entitled to one vote per share on all matters submitted to a vote of our stockholders, including the election of directors. Our articles of incorporation do not provide for cumulative voting in the election of directors, and our amended and restated bylaws provide that directors are elected by a plurality vote of the votes cast and entitled to vote on the election of directors at any meeting for the election of directors at which a quorum is present. Matters other than the election of directors to be voted on by stockholders are generally approved if, at a duly convened stockholder meeting, the number of votes cast in favor of the action exceeds the number of votes cast in opposition to the action, unless a different vote for the action is required by applicable law, our articles of incorporation or our amended and restated bylaws. Applicable Nevada law requires any amendment to our articles of incorporation to be approved by stockholders holding shares entitling them to exercise at least a majority of the voting power of the Company. The holders of our Common Stock will be entitled to cash dividends as may be declared, if any, by the Board from funds available. Upon liquidation, dissolution or winding up of our Company, the holders of our Common Stock (the "**Common Stockholders**") will be entitled to receive pro rata all assets available for distribution to the holders. All rights of our Common Stockholders described in this paragraph could be subject to any preferential voting, liquidation or other rights of any series of preferred stock that we may authorize and issue in the future. Our Common Stock is presently traded on the QB tier of the OTC Marketplace under the trading symbol "**ARTH**".

Anti-Takeover Provisions of Nevada State Law

Some features of the Nevada Revised Statutes (“NRS”), which are further described below, may have the effect of deterring third parties from making takeover bids for control of us or may be used to hinder or delay a takeover bid. This would decrease the chance that our stockholders would realize a premium over market price for their shares of Common Stock as a result of a takeover bid.

Acquisition of Controlling Interest

The NRS contain provisions governing acquisition of a controlling interest of a Nevada corporation. These provisions provide generally that any person or entity that acquires a certain percentage of the outstanding voting shares of a Nevada corporation may be denied voting rights with respect to the acquired shares, unless certain criteria are satisfied. Our amended and restated bylaws provide that these provisions will not apply to us or to any existing or future stockholder or stockholders.

Combination with Interested Stockholder

The NRS contain provisions governing combinations of a Nevada corporation that has 200 or more stockholders of record with an “interested stockholder.” These provisions only apply to a Nevada corporation that, at the time the potential acquirer became an interested stockholder, has a class or series of voting shares listed on a national securities exchange, or has a class or series of voting shares traded in an “organized market” and satisfies certain specified public float and stockholder levels. As we do not now meet those requirements, we do not believe that these provisions are currently applicable to us. However, to the extent they become applicable to us in the future, they may have the effect of delaying or making it more difficult to affect a change in control of the Company in the future.

A corporation affected by these provisions may not engage in a combination within two years after the interested stockholder acquires his, her or its shares unless the combination or purchase is approved by the board of directors before the interested stockholder acquired such shares. Generally, if approval is not obtained, then after the expiration of the two-year period, the business combination may be consummated with the approval of the board of directors before the person became an interested stockholder or a majority of the voting power held by disinterested stockholders, or if the consideration to be received per share by disinterested stockholders is at least equal to the highest of:

- the highest price per share paid by the interested stockholder within the three years immediately preceding the date of the announcement of the combination or within three years immediately before, or in, the transaction in which he, she or it became an interested stockholder, whichever is higher;
- the market value per share on the date of announcement of the combination or the date the person became an interested stockholder, whichever is higher; or
- if higher for the holders of preferred stock, the highest liquidation value of the preferred stock, if any.

Generally, these provisions define an interested stockholder as a person who is the beneficial owner, directly or indirectly of 10% or more of the voting power of the outstanding voting shares of a corporation, and define combination to include any merger or consolidation with an interested stockholder, or any sale, lease, exchange, mortgage, pledge, transfer or other disposition, in one transaction or a series of transactions with an interested stockholder of assets of the corporation:

- having an aggregate market value equal to 5% or more of the aggregate market value of the assets of the corporation;
- having an aggregate market value equal to 5% or more of the aggregate market value of all outstanding shares of the corporation; or
- representing 10% or more of the earning power or net income of the corporation.

Warrants and Options Issued and Outstanding

As of November 16, 2016 there were issued and outstanding:

- Series A Warrants to purchase 25,000 shares (none of which have been registered for resale under the 2016 S-3 Registration Statement of which this prospectus forms a part) of Common Stock issuable thereunder at an exercise price of \$0.20 per share;
- Series D Warrants to purchase 10,951,663 shares of Common Stock issuable thereunder at an exercise price of \$0.25 per share;
- Series E Warrants to purchase 6,258,323 shares of Common Stock issuable thereunder at an exercise price of \$0.4380 per share; and
- The MLSC Warrant issued to MLSC in connection with the MLSC Loan Agreement to purchase up to 145,985 shares of Common Stock with an exercise price of \$0.274 per share.
- Options granted to employees, directors and consultants under the 2013 Plan to purchase up to an aggregate of 12,479,214 shares of Common Stock at exercise prices ranging from \$0.17 to \$0.72 per share and with a weighted average exercise price of \$0.33 per share.

Transfer Agent

The transfer agent for our Common Stock is Empire Stock Transfer. Our transfer agent's address is 1859 Whitney Mesa Drive, Henderson, Nevada 89014.

PLAN OF DISTRIBUTION

We are registering (i) the shares of Common Stock issued; and (ii) the shares of Common Stock issuable upon exercise of the Series A Warrants, in each case, issued originally to the 2014 Investors in the 2014 Private Placement Financing to permit the resale of these shares of Common Stock by the selling securityholders from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling securityholders of the shares of Common Stock. We will bear all fees and expenses incident to our obligation to register the shares of Common Stock.

The selling securityholders may sell all or a portion of the shares of Common Stock held by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of Common Stock are sold through underwriters or broker-dealers, the selling securityholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of Common Stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions, pursuant to one or more of the following methods:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales effected after the date the registration statement of which this prospectus is a part was declared effective by the SEC (July 2, 2014);
- broker-dealers may agree with a selling securityholder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling securityholders may also sell shares of Common Stock under Rule 144 promulgated under the Securities Act, if available, rather than under this prospectus. In addition, the selling securityholders may transfer the shares of Common Stock by other means not described in this prospectus. If the selling securityholders effect such transactions by selling shares of Common Stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling securityholders or commissions from purchasers of the shares of Common Stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved but, except as set forth in a supplement to this prospectus to the extent required, in the case of an agency transaction will not be in excess of a customary brokerage commission in compliance with FINRA Rule 5110).

In connection with sales of the shares of Common Stock or otherwise, the selling securityholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of Common Stock in the course of hedging in positions they assume. The selling securityholders may also sell shares of Common Stock short and deliver shares of Common Stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling securityholders may also loan or pledge shares of Common Stock to broker-dealers that in turn may sell such shares.

The selling securityholders may pledge or grant a security interest in some or all of the Series A Warrants or shares of Common Stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of Common Stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending, if necessary, the list of selling securityholders to include the pledgee, transferee or other successors in interest as selling securityholders under this prospectus. The selling securityholders also may transfer and donate the shares of Common Stock in other circumstances as permitted by the 2014 SPA, the 2014 Registration Rights Agreement, the Series A Warrants and all applicable law, in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

To the extent required by the Securities Act and the rules and regulations thereunder, the selling securityholders and any broker-dealer participating in the distribution of the shares of Common Stock may be deemed to be “underwriters” within the meaning of the Securities Act. In such event, any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. Selling securityholders who are deemed to be “underwriters” under the Securities Act (if any) will be subject to the prospectus delivery requirements of the Securities Act and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Exchange Act.

Each selling securityholder has informed us that it is not a registered broker-dealer and does not have any written or oral agreement or understanding, directly or indirectly, with any person to engage in a distribution of the Common Stock. Upon us being notified in writing by a selling securityholder that any material arrangement has been entered into with a broker-dealer for the distribution of Common Stock, a prospectus supplement, if required, will be distributed, which will set forth the aggregate amount of shares of Common Stock being distributed and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling securityholders and any discounts, commissions or concessions allowed or re-allowed or paid to broker-dealers.

Under the securities laws of some states, the shares of Common Stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of Common Stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

Each selling securityholder may sell all, some or none of the shares of Common Stock registered pursuant to the registration statement of which this prospectus forms a part. If sold under the registration statement of which this prospectus forms a part, the shares of Common Stock registered hereunder will be freely tradable in the hands of persons other than our affiliates that acquire such shares.

The selling securityholders and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of Common Stock by the selling securityholders and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock to engage in market-making activities with respect to the shares of Common Stock. All of the foregoing may affect the marketability of the shares of Common Stock and the ability of any person or entity to engage in market-making activities with respect to the shares of Common Stock.

We have agreed to keep this prospectus effective until the earlier of (i) the date on which the securities may be resold by the selling securityholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for the Company to be in compliance with the current public information provisions under Rule 144 under the Securities Act or any other rule of similar effect; or (ii) all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. We have also agreed to pay all expenses, including reimbursement of up to \$35,000 of costs and expenses incurred by Cranshire or its affiliates, associated with the registration of the shares of Common Stock pursuant to the 2014 Registration Rights Agreement, estimated to be \$228,047 in total, including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, a selling securityholder will pay all underwriting discounts and selling commissions, if any.

We have further agreed to indemnify or provide contribution to the selling securityholders with respect to certain liabilities, including some liabilities under the Securities Act, in accordance with the registration rights agreements. Each selling securityholder, severally and not jointly, has agreed to indemnify or provide contribution to us with respect to certain civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the selling securityholder specifically for use in this prospectus, in accordance with the related registration rights agreements.

LEGAL MATTERS

The validity of the Common Stock being offered hereby has been passed upon for us by McDonald Carano Wilson LLP, Reno, Nevada.

EXPERTS

Moody, Famiglietti & Andronico, LLP, an independent registered public accounting firm, has audited our consolidated financial statements for the years ended September 30, 2015 and 2014, as stated in its report appearing herein, and such audited consolidated financial statements have been so included in reliance upon the report of such firm given upon its authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read or obtain a copy of these reports at the SEC’s public reference room at 100 F Street, N.E., Washington, D.C. 20549, on official business days during the hours of 10:00 am to 3:00 pm. You may obtain information on the operation of the public reference room and its copy charges by calling the SEC at 1-800-SEC-0330. The SEC maintains a website, at <http://www.sec.gov>, that contains registration statements, reports, proxy information statements and other information regarding registrants that file electronically with the SEC, including us. Our website address is <http://www.archtherapeutics.com>. We have not incorporated by reference into this prospectus the information on our website, and you should not consider it to be a part of this document.

The SEC allows us to “incorporate by reference” information that we file with it into this prospectus, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is an important part of this prospectus. The information incorporated by reference is considered to be a part of this prospectus, and information that we file later with the SEC will automatically update and supersede information contained in this prospectus and any accompanying prospectus supplement.

We incorporate by reference the documents listed below that we have previously filed with the SEC, each of which has Exchange Act File No. 000-54986 unless otherwise noted:

- our Annual Report on Form 10-K for the fiscal year ended September 30, 2015, filed with the SEC on December 11, 2015;
- our Quarterly Reports on Form 10-Q for the quarters ended December 31, 2015, March 30, 2016, and June 30, 2016, which were filed with the SEC on February 2, 2016, April 28, 2016 and July 28, 2016, respectively;
- our Current Reports on Form 8-K filed with the SEC on December 01, 2015, December 03, 2015, December 16, 2015, March 07, 2016, March 09, 2016, March 14, 2016, March 22, 2016, April 05, 2016, April 11, 2016, April 25, 2016, May 06, 2016, May 10, 2016, May 16, 2016, June 02, 2016, June 06, 2016, August 15, 2016, September 29, 2016 and October 31, 2016; and

the description of our Common Stock as set forth under the caption “Description of Securities” in our Registration Statement on Form S-1/A (File No. 333-178883), as amended and filed with the SEC on February 24, 2012, including any amendments thereto or reports filed for the purposes of updating this description (including our Current Report on Form 8-K filed with the SEC on June 26, 2013 (File No. 333-178883)).

All reports and other documents that we file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (i) after the date of the initial registration statement and prior to effectiveness of the registration statement, or (ii) from the date of this prospectus but prior to the termination of the offering of the securities hereunder will also be considered to be incorporated by reference into this prospectus from the date of the filing of these reports and documents, and will supersede the information herein; *provided, however*, that all reports, exhibits and other information that we “furnish” to the SEC will not be considered incorporated by reference into this prospectus. Any statement contained in a document incorporated by reference in this prospectus or any prospectus supplement shall be deemed to be modified or superseded to the extent that a statement contained herein, therein or in any other subsequently filed document that also is incorporated by reference herein or therein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus or any prospectus supplement.

We will provide you without charge, upon your oral or written request, with a copy of any or all reports, proxy statements and other documents we file with the SEC, as well as any or all of the documents incorporated by reference in this prospectus or the registration statement (other than exhibits to such documents unless such exhibits are specifically incorporated by reference into such documents). Requests for such copies should be directed to:

Arch Therapeutics, Inc.
235 Walnut St., Suite 6
Framingham, MA 01702
(617) 431-2313

Up to 2,500,000 Shares of Common Stock



PROSPECTUS

, 2016

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The following table sets forth the costs and expenses payable in connection with the sale and distribution of the securities being registered. All amounts are estimates except the SEC registration fee (which has previously been paid).

| EXPENSE | AMOUNT |
|---|-------------------|
| SEC Registration Fees | \$ 3,047 |
| Legal Fees | 103,000 |
| Accounting Fees | 72,000 |
| Miscellaneous Fees and Expenses (including reimbursement of costs and expenses incurred by one of the selling securityholders named in this registration statement) | 50,000 |
| Total | <u>\$ 228,047</u> |

Item 15. Indemnification of Directors and Officers.

We have not entered into separate indemnification agreements with our directors and officers. Our amended and restated bylaws provide that we shall indemnify any director or officer to the fullest extent authorized by the laws of the State of Nevada. Our amended and restated bylaws further provide that we shall pay the expenses incurred by an officer or director (acting in his capacity as such) in defending any action, suit or proceeding in advance of the final disposition of such action, suit or proceeding, subject to the delivery to us by or on behalf of such director or officer of an undertaking to repay the amount of such expenses if it shall ultimately be determined that he or she is not entitled to be indemnified by us as authorized in our bylaws or otherwise.

The Nevada Revised Statutes provide us with the power to indemnify any of our directors, officers, employees and agents as follows:

- a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, except an action by or in the right of the corporation, by reason of the fact that he is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses, including attorneys' fees, judgments, fines and amounts paid in settlement actually and reasonably incurred by him in connection with the action, suit or proceeding if he or she acted in good faith and in a manner which he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful;
- a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses, including amounts paid in settlement and attorneys' fees actually and reasonably incurred by him or her in connection with the defense or settlement of the action or suit if he or she acted in good faith and in a manner which he or she reasonably believed to be in or not opposed to the best interests of the corporation. Indemnification may not be made for any claim, issue or matter as to which such a person has been adjudged by a court of competent jurisdiction, after exhaustion of all appeals therefrom, to be liable to the corporation or for amounts paid in settlement to the corporation, unless and only to the extent that the court in which the action or suit was brought or other court of competent jurisdiction determines upon application that in view of all the circumstances of the case, the person is fairly and reasonably entitled to indemnity for such expenses as the court deems proper; and

- to the extent that a director, officer, employee or agent of a corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding, or in defense of any claim, issue or matter therein, the corporation must indemnify him or her against expenses, including attorneys' fees, actually and reasonably incurred by him or her in connection with the defense.

The Nevada Revised Statutes provide that a corporation may make any discretionary indemnification only as authorized in the specific case upon a determination that indemnification of the director, officer, employee or agent is proper in the circumstances. The determination must be made:

- by the stockholders of the corporation;
- by the board of directors of the corporation by majority vote of a quorum consisting of directors who were not parties to the action, suit or proceeding;
- if a majority vote of a quorum consisting of directors who were not parties to the action, suit or proceeding so orders, by independent legal counsel in a written opinion;
- if a quorum consisting of directors who were not parties to the action, suit or proceeding cannot be obtained, by independent legal counsel in a written opinion; or
- by court order.

The Nevada Revised Statutes further provide that a corporation may purchase and maintain insurance or make other financial arrangements on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise for any liability asserted against him and liability and expenses incurred by him in his capacity as a director, officer, employee or agent, or arising out of his status as such, whether or not the corporation has the authority to indemnify him against such liability and expenses. We have secured a directors' and officers' liability insurance policy. We expect that we will continue to maintain such a policy.

Item 16. Exhibits

The Index to Exhibits listing the exhibits required by Item 601 of Regulation S-K is located on the page immediately following the signature page to this registration statement.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:
 - (a) To include any prospectus required by section 10(a)(3) of the Securities Act of 1933;
 - (b) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

- (c) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

Provided, however, that paragraphs (1)(a), (1)(b) and (1)(c) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

- (2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:
 - (a) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and
 - (b) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. *Provided, however,* that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.
- (5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the registrant undertakes that in a primary offering of securities of the registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:
 - (a) Any preliminary prospectus or prospectus of the registrant relating to the offering required to be filed pursuant to Rule 424;
 - (b) Any free writing prospectus relating to the offering prepared by or on behalf of the registrant or used or referred to by the registrant;
 - (c) The portion of any other free writing prospectus relating to the offering containing material information about registrant or its securities provided by or on behalf of the registrant; and

- (d) Any other communication that is an offer in the offering made by a registrant to the purchaser.
- (6) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
- (7) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the forgoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Framingham, State of Massachusetts, on November 17, 2016.

Arch Therapeutics, Inc.

By: /s/ Terrence W. Norchi, MD
Terrence W. Norchi, MD
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

| <u>SIGNATURE</u> | <u>TITLE</u> | <u>DATE</u> |
|---|---|-------------------|
| <u>/s/ Terrence W. Norchi, MD</u> Terrence W. Norchi, MD | President, Chief Executive Officer and Director <i>(Principal Executive Officer)</i> | November 17, 2016 |
| <u>/s/ Richard E. Davis</u> Richard E. Davis | Chief Financial Officer <i>(Principal Financial and Accounting Officer)</i> | November 17, 2016 |
| <u>/s/ Avtar Dhillon, MD*</u> Avtar Dhillon, MD | Director | November 17, 2016 |
| <u>/s/ James R. Sulat*</u> James R. Sulat | Director | November 17, 2016 |

* By: /s/ Terrence W. Norchi, MD
Terrence W. Norchi, MD
Attorney-in-Fact

EXHIBIT INDEX

| Exhibit No. | Exhibit Title | Filed Herewith | Incorporated By Reference | | | |
|------------------------|---|---------------------------|----------------------------------|------------------------|-----------------|--------------------|
| | | | Form | Exhibit No. | File No. | Filing Date |
| 2.1 | Agreement and Plan of Merger dated May 10, 2013, by and among Almah, Inc., Arch Acquisition Corporation, and Arch Therapeutics, Inc. | | 8-K | 2.1 | 333-178883 | 5/13/2013 |
| 2.2 | Amendment No. 1 to Agreement and Plan of Merger, dated May 23, 2013, by and among Almah, Inc., Arch Acquisition Corporation, and Arch Therapeutics, Inc.. | | 10-Q | 10.11 | 000-54986 | 8/14/2013 |
| 4.1 | Restated Articles of Incorporation of Arch Therapeutics, Inc. | | 10-K | 3.1 | 000-54986 | 12/12/2014 |
| 4.2 | Amended and Restated Bylaws of Arch Therapeutics, Inc. | | 8-K | 3.1 | 333-178883 | 6/24/2013 |
| 4.3 | Form of Series A Warrants | | 8-K | 4.1 | 000-54986 | 1/31/2014 |
| 5.1 | Opinion of McDonald Carano LLP | X | | | | |
| 23.1 | Consent of Independent Registered Public Accounting Firm | X | | | | |
| 23.2 | Consent of McDonald Carano LLP (included in Exhibit 5.1) | X | | | | |
| 24.1 | Power of Attorney | | S-3 | 24.1 | 333-214347 | 10/31/2016 |

November 17, 2016

Board of Directors
Arch Therapeutics, Inc.
235 Walnut Street, Suite 6
Framingham, MA 01702

Re: Registration Statement/Form S-3

Gentlemen:

We have acted as special Nevada counsel to Arch Therapeutics, Inc. (the “**Company**”) in connection with the filing by the Company of that certain Registration Statement on Form S-3, (the “**Registration Statement**”), with the Securities and Exchange Commission in connection with the registration under the Securities Act of 1933, as amended (the “**Securities Act**”), of the offering from time to time by the selling securityholders, as described in the Registration Statement, of up to 2,500,000 shares of the Company’s Common Stock, par value \$0.001 per share (the “**Common Shares**”), as more fully described in the Registration Statement. Pursuant to Rule 416 under the Securities Act, the securities registered under the Registration Statement include such indeterminate number of additional shares of Common Stock of the Company as may be issued or issuable because of stock splits, stock dividends, stock distributions, and similar transactions.

As the special Nevada counsel to the Company in connection with the Registration Statement, we have examined the actions taken by the Company in connection with the authorization of the issuance of the Common Shares, the Warrants, and the Warrant Shares, and such documents as we have deemed necessary to render this opinion.

Based upon and subject to the foregoing, it is our opinion that the Common Shares to be sold by the selling securityholders pursuant to the Registration Statement have been duly authorized and are validly issued, fully paid and non-assessable.

We consent to the use of this opinion as an exhibit to the Registration Statement and further consent to all references to us in the Registration Statement and any amendment thereto.

Sincerely,

/s/ McDonald Carano Wilson LLP
McDONALD CARANO WILSON LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors
Arch Therapeutics, Inc. and Subsidiary
Framingham, MA 01702

We hereby consent to the incorporation by reference in this Registration Statement on Form S-3 (File No. 333-214347) of Arch Therapeutics, Inc. and Subsidiary (collectively, the “**Company**”) of our report (which contains an explanatory paragraph relating to the Company’s ability to continue as a going concern as described in Notes 1 and 2 to the consolidated financial statements) dated December 11, 2015, relating to the consolidated financial statements of the Company appearing in the Annual Report on Form 10-K for the year ended September 30, 2015.

We also consent to the reference to us under the heading “Experts” in such Registration Statement.

/s/ Moody, Famiglietti & Andronico, LLP

Moody, Famiglietti & Andronico, LLP
Tewksbury, Massachusetts
November 17, 2016
