

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:

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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: x

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: x

CALCULATION OF REGISTRATION FEE

| Title of Each Class of Securities to be Registered | Amount to be Registered(1) | Proposed Maximum Offering Price per Share(2) | Proposed Maximum Aggregate Offering Price(2) | Amount of Registration Fee |
|--|----------------------------|--|--|----------------------------|
| Common Stock, par value \$0.001 per share | 16,531,508 | \$ 0.5825 | \$9,629,603.41 | \$ 1,116.07 |

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Consists of 5,624,845 shares of Common Stock, par value \$0.001 per share (“**Common Stock**”) and an aggregate of 10,906,663 shares of Common Stock currently issuable upon the exercise of Arch Therapeutics, Inc.’s (the (1) “**Company**”) Series D Warrants. Pursuant to Rule 416 under the Securities Act of 1933, as amended, there is also being registered hereby such indeterminate number of additional shares of Common Stock as may be issued or issuable because of stock splits, stock dividends, stock distributions, and similar transactions.

(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) under the Securities Act of 1933, as amended. The proposed maximum offering price per share and proposed maximum aggregate offering price are based upon the average of the high \$0.595 and low \$0.57 bid prices of our Common Stock on October 26, 2016 as reported by on the QB tier of the OTC Marketplace.

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.

EXPLANATORY NOTE

Under the terms of a registration rights agreement (the “**2015 Registration Rights Agreement**”) that we entered into with the investors in our private placement that concluded on July 2, 2015 (the “**2015 Private Placement Financing**”), we became obligated, subject to certain conditions, to file with the Securities and Exchange Commission (the “**SEC**”), one or more registration statements to register the shares of our common stock, par value \$0.001 per share (“**Common Stock**”) issued in, and underlying our Series D Warrants issued in, the 2015 Private Placement Financing for resale under the Securities Act of 1933, as amended (the “**Securities Act**”). As a result, on September 11, 2015, we filed a registration statement with the SEC on Form S-1 (File No. 333-206873) (the “**2015 Registration Statement**”) to initially register for resale by the selling securityholders identified in the prospectus therein an aggregate of 28,781,508 shares of our Common Stock. The 2015 Registration Statement, as amended on October 16, 2015, was declared effective by the SEC on October 27, 2015.

On January 8, 2016, we filed post-effective amendment No. 1 to the 2015 Registration Statement (“**Post-Effective Amendment No. 1**”) to (i) include information from our Annual Report on Form 10-K for the year ended September 30, 2015; and (ii) update certain other information in the prospectus relating to the offering and sale of the shares that were registered for resale on the original 2015 Registration Statement. Post-Effective Amendment No. 1 was declared effective by the SEC on January 14, 2016.

The 2015 Registration Rights Agreement also obligates us to register the resale of all securities covered by the 2015 Registration Rights Agreement on a short-form registration statement on Form S-3 as soon as we become eligible to use Form S-3. This registration statement on Form S-3 (the “**2016 S-3 Registration Statement**”) is being filed to satisfy this obligation. If this 2016 S-3 Registration Statement becomes effective, the securities covered by the 2015 Registration Rights Agreement will be registered under both the 2015 Registration Statement and this 2016 S-3 Registration Statement unless and until we file a post-effective amendment to de-register the remaining securities registered on the 2015 Registration Statement.

The aggregate market value of voting and non-voting common equity held by our non-affiliates was greater than \$75.9 million as of October 3, 2016, based upon the closing price of our Common Stock on the QB tier of the OTC Marketplace reported for such date and 115,238,692 non-affiliate shares. This calculation does not reflect a determination that certain persons are affiliates of the registrant for any other purpose.

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 October 31, 2016

PROSPECTUS

Up to 16,531,508 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 16,531,508 shares of common stock, par value \$0.001 per share (“**Common Stock**”). These shares include the 5,624,845 shares of issued and outstanding Common Stock currently held by the selling securityholders and 10,906,663 shares of Common Stock currently underlying Series D Warrants held by the selling securityholders, all of which were initially issued and sold in a private placement offering that was concluded on July 2, 2015 (the “**2015 Private Placement Financing**”). The Common Stock issued in the 2015 Private Placement Financing was sold as a part of a unit (“**Unit**”) consisting of a share of our Common Stock and a Series D Warrant at a purchase price of \$0.22 per Unit. The Series D Warrants entitle the holders thereof to purchase a share of Common Stock at an initial exercise price of \$0.25 per share, were exercisable immediately upon issuance and expire five years thereafter.

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 October 28, 2016, the closing price of our common stock was \$0.5637 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.

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

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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 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.

2015 Private Placement Financing

Beginning June 22, 2015 and through June 30, 2015, we entered into a series of substantially similar subscription agreements (each a “**2015 Subscription Agreement**”) with 20 accredited investors (collectively, the “**2015 Investors**”) providing for the issuance and sale by the Company to the 2015 Investors, in a private placement, of an aggregate of 14,390,754 Units at a purchase price of \$0.22 per Unit (the “**2015 Private Placement Financing**”). Each Unit consisted of a share of Common Stock, and a Series D Warrant to purchase a share of Common Stock at an exercise price of \$0.25 per share at any time prior to the fifth anniversary of the issuance date of the Series D Warrant (the “**Series D Warrants**,” and the shares issuable upon exercise of the Series D Warrants, collectively, the “**Series D Warrant Shares**”).

The number of shares of Common Stock into which each of the Series D Warrants is exercisable and the exercise price therefor are subject to adjustment as set forth in the Series D Warrants, including adjustments for stock subdivisions or combinations (by any stock split, stock dividend, recapitalization, reorganization, scheme, arrangement or otherwise). In addition, (i) at anytime during the term of the Series D Warrants, we may reduce the then current exercise price to any amount and for any period of time deemed appropriate by our Board of Directors (the “**Board**”); and (ii) certain of the Series D Warrants provide that they shall not be exercisable in the event and to the extent that the exercise thereof would result in the holder of the Series D Warrant or any of its affiliates beneficially owning more than 4.9% of our Common Stock, but such ownership limitation may be waived at the holder’s discretion, provided that such waiver will not become effective until the 61st day after delivery of such waiver notice.

We did not engage any underwriter or placement agent in connection with the 2015 Private Placement Financing. The aggregate gross proceeds raised by us in the 2015 Private Placement Financing totaled approximately \$3,166,000, and upon the Second Closing (as later defined) on July 2, 2015, the number of shares of our Common Stock outstanding

increased by over eighteen percent (18%) from 78,766,487 to 93,157,241.

The Company's obligation to issue and sell the Units, and the corresponding obligation of the 2015 Investors to purchase such securities were subject to a number of conditions precedent including, but not limited to, the amendment of the Series A Warrants and Series C Warrants that we had previously issued in our private placement financing that closed on February 4, 2014 (the "**2014 Private Placement Financing**") to delete certain anti-dilution provisions contained therein, and other customary closing conditions. The conditions precedent were satisfied June 30, 2015 (the "**Initial Closing Date**"), and on that date we conducted an initial closing (the "**Initial Closing**") pursuant to which we sold and 19 of the 2015 Investors (the "**Initial Investors**") purchased 13,936,367 Units at an aggregate purchase price of approximately \$3,066,000. On July 2, 2015, we conducted a second closing (the "**Second Closing**") and together with the Initial Closing, the "**Closings**") pursuant to which we sold and the remaining 2015 Investor purchased 454,387 Units at an aggregate purchase price of approximately \$100,000.

On the Initial Closing Date, we entered into a registration rights agreement with the Initial Investors (the “**2015 Registration Rights Agreement**”), pursuant to which we became obligated, subject to certain conditions, to file with the SEC within 90 days after the closing of the 2015 Private Placement Financing one or more registration statements to register the shares of Common Stock issued in the Closings and the Series D Warrant Shares for resale under the Securities Act. The remaining 2015 Investor became a party to the 2015 Registration Rights Agreement upon the consummation of the Second Closing. As a result, we initially registered for resale under a registration statement on Form S-1 (File Number 333-206873, and such registration statement, the “**2015 Registration Statement**”) an aggregate of 28,781,508 shares of Common Stock, representing the (i) 14,390,754 shares issued at the Closings of the 2015 Private Placement Financing and (ii) 14,390,754 shares underlying the Series D Warrants.

The 2015 Registration Rights Agreement also obligates us to register the resale of all securities covered by the 2015 Registration Rights Agreement on a short-form registration statement on Form S-3 as soon as we become eligible to use Form S-3. This registration statement on Form S-3 (the “**2016 S-3 Registration Statement**” and together with the 2015 Registration Statement, the “**Registration Statements**”) is being filed to satisfy this obligation. If this 2016 S-3 Registration Statement becomes effective, the securities covered by the 2015 Registration Rights Agreement will be registered under both the 2015 Registration Statement and this 2016 S-3 Registration Statement unless and until we file a post-effective amendment to de-register the remaining securities registered on the 2015 Registration Statement.

Our failure to satisfy certain deadlines with respect to the Registration Statements and certain other requirements set forth in the 2015 Registration Rights Agreement may require us to pay monetary penalties to the 2015 Investors and/or their assignees. Because the Series D Warrants are subject to certain adjustments and permit, in certain circumstances, the “cashless” exercise thereof, the number of shares that will actually be issuable upon any exercise thereof may be more or less than the number of shares being offered by this prospectus. In the event of any such adjustment to the number of shares issuable upon exercise of the Series D Warrants, the provisions of the 2015 Registration Rights Agreement would obligate us to register for resale any additional shares of our Common Stock that may then be issuable upon exercise of the Series D Warrants.

Under the 2015 Registration Rights Agreement, subject to exception in certain circumstances, we have agreed to keep at least one of the Registration Statements effective until the earlier of the date on which all shares of Common Stock to be registered hereunder have been sold, and the twelve month anniversary of the date the 2015 Registration Statement was declared effective by the SEC, which will occur on October 27, 2016. If there is not an effective registration statement covering the resale of any of the shares issued in or issuable upon exercise of the Series D Warrants issued in the 2015 Private Placement Financing, then the selling securityholders will be entitled to exercise their Series D Warrants on a “cashless exercise” or “net exercise” basis during the period when the shares issuable upon exercise of such Series D Warrants are not so registered

Ten of the Selling Securityholders, or their respective affiliates, have participated in other financings that were conducted by us. In particular and as set forth in the table below, (i) Intracoastal Capital, LLC (“**Intracoastal**”) or its affiliates, were investors in the 2014 Private Placement Financing and convertible notes offering that closed on March

13, 2015 (the “**Notes Offering**”); and (ii) Karen Carlin and Ronald Bryan Woodard, Drake Partners Equity LLC (“**Drake**”), Jonathan Galli, Intracoastal, the Keyes Sulat Revocable Trust (the “**Trust**”), Lorraine A. Malanga, James M. McKeone, Tungsten III, LLC (“**Tungsten**”), Dr. Stephanie Plent, and Popham Management, LLC (“**Popham**”) and/or their respective affiliates were investors in the Company’s private placement financing that concluded on May 26, 2016 (the “**2016 Private Placement Financing**”). The table below summarizes the securities purchased by each of the Selling Securityholders, or their respective affiliates, in the 2014 Private Placement Financing, the Notes Offering, and 2016 Private Placement Financing.

| Investor | 2014 Private Placement | | | | Notes Offering Aggregate Principal Amount of Notes | 2016 Private Placement | |
|---------------------------------------|--|-------------------------------|-------------------------------|-------------------------------|--|--|-------------------------------|
| | 2014 Private Placement Shares | Series A Warrant Shares | Series B Warrant Shares | Series C Warrant Shares | | 2016 Private Placement Shares | Series E Warrant Shares |
| Karen Carlin and Ronald Bryan Woodard | | 0 | 0 | 0 | | 70,000 | 52,500 |
| Drake Partners Equity LLC | | 0 | 0 | 0 | | 111,111 | 83,333 |
| Jonathan Galli | | 0 | 0 | 0 | | 200,000 | 150,000 |
| Intracoastal Capital, LLC | 800,000 | 800,000 | 800,000 | 800,000 | 250,000 | 1,388,888 | 1,041,666 |
| Keyes Sulat Revocable Trust | | 0 | 0 | 0 | | 111,111 | 83,333 |
| Lorraine A. Malanga | | 0 | 0 | 0 | | 70,000 | 52,500 |
| James M. McKeone | | 0 | 0 | 0 | | 83,334 | 62,500 |
| Tungsten III, LLC | | 0 | 0 | 0 | | 2,222,223 | 1,666,667 |
| Dr. Stephanie Plent | | 0 | 0 | 0 | | 138,889 | 104,166 |
| Popham Management, LLC | | 0 | 0 | 0 | | 277,778 | 208,333 |

James R. Sulat, who was appointed as a member of the Board on August 19, 2015, is a co-trustee of the Trust along with his wife. In accordance with the Company's policies governing related party transactions, Mr. Sulat disclosed his interest in the 2016 Private Placement Financing to the remaining members of the Board, all of whom were disinterested in the transaction (the "**Disinterested Directors**"), and recused himself from discussing or voting on matters related to the 2016 Private Placement Financing. On May 24, 2016, The Disinterested Directors unanimously approved the 2016 Private Placement Financing.

In addition to participating in both the 2016 Private Placement Financing and 2015 Private Placement Financing, the Trust also previously purchased a promissory note in the aggregate principal amount of \$75,000 and warrants from our wholly-owned subsidiary, ABS, on June 19, 2013. In contemplation of the Merger, the securities purchased by the Trust were amended and restated to provide for (i) the conversion of all amounts owed under the promissory note into an aggregate of 273,277 shares of the Company's Common Stock upon the closing of the Merger, calculating to approximately one share of the Company's Common Stock for each \$0.27 outstanding under the promissory note, and (ii) the cancellation of the warrants in full upon the closing of the Merger. Accordingly, upon the closing of the Merger on June 26, 2013, the promissory note was converted into 273,277 shares of our Common Stock and the warrants were cancelled.

On June 30, 2015, the Initial Closing Date, the Series D Warrants had an exercise price lower than the market value of our Common Stock, which closed at \$0.26 on the OTCQB on such date, resulting in an aggregate discount to the market price of our Common Stock of \$139,364. On July 2, 2015, the date of the Second Closing, Series D Warrants had an exercise price higher than the market value of our Common Stock, which closed at \$0.23 on the OTCQB on such date, and therefore did not have any discount to the market price of our Common Stock as of such date. The tables below indicate the total possible discount to the market price of our Common Stock as of June 30, 2015 for the shares of our Common Stock underlying the Series D Warrants issued upon the Initial Closing, as well as similar

information for the Series D Warrants issued upon the Second Closing.

Series D Warrants Issued on June 30, 2015

| | |
|---|-------------|
| Market price per share of our Common Stock on June 30, 2015, the Initial Closing Date: | \$0.26 |
| Exercise price per share of the Series D Warrants on the Initial Closing Date: | \$0.25 |
| Total possible shares of Common Stock underlying the Series D Warrants issued on the Initial Closing Date: | 13,936,367 |
| Aggregate market price of all shares of Common Stock underlying the Series D Warrants issued on the Initial Closing Date, based on the market price of our Common Stock on June 30, 2015: | \$3,623,455 |
| Aggregate exercise price of all shares of Common Stock underlying the Series D Warrants issued on the Initial Closing Date, based on the exercise price on the Initial Closing Date: | \$3,484,092 |
| Total possible discount of the exercise price of the Series D Warrants issued on the Initial Closing Date to the market price of our Common Stock as of June 30, 2015: | \$139,364 |

Series D Warrants Issued on July 2, 2015

| | |
|--|------------|
| Market price per share of our Common Stock on July 2, 2015, the date of the Second Closing: | \$0.23 |
| Exercise price per share of the Series D Warrants on the date of the Second Closing: | \$0.25 |
| Total possible shares of Common Stock underlying the Series D Warrants issued on the date of the Second Closing: | 454,387 |
| Aggregate market price of all shares of Common Stock underlying the Series D Warrants issued on the date of the Second Closing, based on the market price of our Common Stock on July 2, 2015: | \$ 104,509 |
| Aggregate exercise price of all shares of Common Stock underlying the Series D Warrants issued on the date of the Second Closing, based on the exercise price on the date of the Second Closing: | \$ 113,597 |

The net proceeds to us from the 2015 Private Placement Financing, after giving effect to legal and other expenses incurred through the date of this prospectus, were approximately \$3.0 million. The table below describes in more detail these costs associated with the 2015 Private Placement Financing through the date of this prospectus:

| | |
|--|----------------|
| Gross proceeds of the 2015 Private Placement Financing: | \$3,166,000(1) |
| Legal and other expenses incurred in connection with the 2015 Private Placement Financing: | \$ 150,000 (2) |
| Resulting net proceeds to the Company: | \$3,016,000(3) |
| Total possible profit to be realized by the selling securityholders and/or their assignees as a result of any exercise discounts underlying the Series D Warrants: | \$ 139,364 (4) |

(1) Does not include (i) \$859,773 in gross proceeds paid to us upon the exercise of Series D Warrants that occurred on or prior to October 28, 2016, and (ii) potential gross proceeds payable to us upon exercise of the Series D Warrants issued in the 2015 Private Placement Financing, which would equal approximately \$2,737,916 if all 10,951,663 (10,906,663 of which have been registered for resale under this 2016 S-3 Registration Statement of which this prospectus forms a part) of the shares issuable under the Series D Warrants outstanding on October 28, 2016 were exercised on a cash basis.

(2) This amount represents our legal, accounting, registration and other fees and expenses associated with the 2015 Private Placement Financing (collectively, “**Transaction Expenses**”), which were estimated to total \$150,000. This amount 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 2015 Registration Rights Agreement the Common Stock issued in the 2015 Private Placement Financing or issuable upon exercise of the Series D Warrants (in a cash amount equal to 1.5% of the price paid to us by each investor in the 2015 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); and (b) payments in respect of claims for which we provide indemnification in the 2015 Registration Rights Agreement. Although we intend to comply with the requirements of the Subscription Agreements and the 2015 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 Transaction Expenses from the gross proceeds to us from the 2015 Private Placement Financing.
- (4) Calculated by adding the total possible discount of the exercise prices of the Series D Warrants to the market price of our Common Stock as of June 30, 2015, as reflected in the tables set forth above.

The Offering

This prospectus relates to the resale from time to time by the selling securityholders identified in this prospectus of up to 16,531,508 shares of our Common Stock issued or underlying the Series D Warrants issued in the 2015 Private Placement Financing. None of the shares to be registered hereby are being offered for sale by us.

Common Stock outstanding prior to October 31, 2016 136,707,075 (1)

Common Stock offered by the selling securityholders 16,531,508 (2)

Common Stock to be outstanding after the offering 147,613,738 (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.

As of October 28, 2016, includes an aggregate of 5,624,845 shares of our Common Stock issued to the selling (1) securityholders in connection with the 2015 Private Placement Financing. Includes 21,418,383 shares of Common Stock held by our affiliates.

Consists of: (a) the 5,624,845 shares of Common Stock currently held by the selling securityholders that were (2) originally issued in connection with the closing of the 2015 Private Placement Financing; and (b) 10,906,663 shares of Common Stock issuable upon exercise of the Series D Warrants determined as if the Series D Warrants were exercised in full (without regard to any limitations on exercise contained therein).

(3) Assumes (a) no further adjustment to the number of shares underlying the Series D Warrants; and (b) the full exercise of the Series D Warrants held by the selling securityholders as of October 28, 2016, which would result in the issuance of an aggregate of 10,906,663 shares of Common Stock. 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) 45,000 shares of Common Stock issuable upon the exercise of the Series D Warrants originally issued in the 2015 Private Placement Financing and subsequently transferred to a third party, none of which are being registered pursuant to the 2016 S-3 Registration Statement of which this prospectus forms a part; (iv) 1,125,000 shares of Common Stock issuable upon the exercise of the Series A Warrants originally issued in the 2014 Private Placement Financing, none of which are being registered pursuant to the 2016 S-3 Registration Statement of which this prospectus forms a part; (v) 6,308,323 shares of Common Stock issuable upon the exercise of the Series E Warrants originally issued in 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 \$2,726,666 from the selling securityholders if they exercise all of the Series D 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 D 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 16,531,508 shares of our Common Stock that were either previously issued or are issuable upon the exercise of our Series D Warrants. The shares of Common Stock being offered by the selling securityholders were issued in, or issuable upon the exercise of Series D Warrants issued in the 2015 Private Placement Financing, and consist of (i) 5,624,845 previously issued shares of Common Stock; and (ii) 10,906,663 shares of Common Stock that may be issuable upon exercise of the Series D Warrants that remained outstanding as of October 28, 2016. For additional information regarding the issuance of the shares of Common Stock and the Series D Warrants, see the description under “**PROSPECTUS SUMMARY | 2015 PRIVATE PLACEMENT FINANCING**” elsewhere in this prospectus.

We are registering the shares of Common Stock hereby pursuant to the terms of the 2015 Registration Rights Agreement among us and the 2015 Investors in order to permit the selling securityholders identified in the table below to offer the shares for resale from time to time. Because the shares of Commons Stock issuable upon the exercise of our Series D Warrants are subject to adjustments if our shares of Common Stock are subdivided or combined (by any stock split, stock dividend, recapitalization, reorganization, scheme, arrangement or otherwise) and our Series D Warrants permit, in certain circumstances, the “cashless” exercise thereof, the number of shares that will actually be issuable upon any exercise thereof may be more or less than the number of shares being offered by this prospectus.

The table below (i) lists the selling securityholders and other information regarding the beneficial ownership (except with respect to Column 2, as determined under Section 13(d) of the Exchange Act of 1934, as amended (the “**Exchange Act**”) and the rules and regulations thereunder) of our Common Stock by each of the selling securityholders (including securities issued in transactions unrelated to the 2015 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) |
| Drake Partners Equity, LLC (6) | 648,990 | 648,990 | 454,546 | 194,444 | 0.14 % |
| David Cornett (7) | 427,274 | 427,274 | 227,274 | 200,000 | 0.15 % |
| Keyes Sulat Revocable Trust (8) | 1,376,813 | 1,376,813 | 909,092 | 467,721 | 0.34 % |
| Stephanie Plent (9) | 989,769 | 989,769 | 454,546 | 535,223 | 0.39 % |
| Ende Family Trust (10) | 250,000 | 250,000 | 250,000 | 0 | 0.00 % |
| Condorcet UK LP (11) | 2,272,728 | 2,272,728 | 2,272,728 | 0 | 0.00 % |
| Scott B and Lucinda S Flaherty (12) | 250,000 | 250,000 | 250,000 | 0 | 0.00 % |
| Lorraine A. Malanga (13) | 349,774 | 349,774 | 227,274 | 122,500 | 0.09 % |
| Jonathan J. Galli (14) | 875,000 | 875,000 | 525,000 | 350,000 | 0.26 % |
| Rocco F. and Jennifer DiFilippo (15) | 227,270 | 227,270 | 227,270 | 0 | 0.00 % |
| Popham Management, LLC (16) | 1,395,203 | 1,395,203 | 909,092 | 486,111 | 0.35 % |
| Karen Carlin and Ronald Bryan Woodard (17) | 349,774 | 349,774 | 227,274 | 122,500 | 0.09 % |
| Steve Lahiji (18) | 300,000 | 300,000 | 300,000 | 0 | 0.00 % |
| Condorcet, LP (19) | 2,272,728 | 2,272,728 | 2,272,728 | 0 | 0.00 % |
| Charles and Lisa J. Cunning (20) | 400,000 | 400,000 | 400,000 | 0 | 0.00 % |
| James M. McKeone (21) | 1,054,926 | 1,054,926 | 909,092 | 145,834 | 0.11 % |
| Armor Securities LLC (22) | 454,547 | 454,547 | 454,547 | 0 | 0.00 % |
| Intracoastal Capital, LLC (23) | 617,286 | 617,286 | 306,045 | 311,241 | 0.23 % |
| Tungsten III, LLC (24) | 9,500,000 | 5,000,000 | 4,500,000 | 5,000,000 | 3.55 % |
| C. Richard Childress (25) | 684,200 | 684,200 | 455,000 | 229,200 | 0.17 % |
| Total | 24,696,282 | 20,196,282 | 16,531,508 | 8,164,774 | 5.86 % |

(1) Reflects the total number of shares of Common Stock held or issuable to each selling securityholder including, to the extent applicable, (a) all remaining securities issued in the 2015 Private Placement Financing, in each case without regard to ownership limitations on the exercise of certain of the Series D Warrants as described in footnote (2) below; (b) all remaining securities issued in the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part and in each case without regard to the ownership limitations on the exercise of certain of the Series E Warrants as described in footnote (2) below; (c) all shares of Common Stock underlying the remaining Series A Warrants issued in the 2014 Private Placement Financing held by such selling securityholder, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part and in each case without regard to ownership limitations on the exercise of the Series A Warrants as described in footnote (2) below; and (d) all other securities issued in transactions unrelated to the 2016 Private Placement Financing, 2015 Private Placement Financing, 2014

Private Placement Financing or Notes Offering (collectively, the “**Private Placement Financings**”), if any, none of which are being registered in the 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.

Certain of the Series E and Series D Warrants issued in the 2016 Private Placement Financing and 2015 Private Placement Financing, respectively and all the Series A Warrants issued in the 2014 Private Placement Financing contain ownership limitations to prevent the exercise of such warrants in certain circumstances. In particular, certain of the Series E Warrants provide that they shall not be exercisable in the event and to the extent that the exercise thereof would result in the holder of the Series E Warrant, together with its affiliates and any other persons whose beneficial ownership of Common Stock would be aggregated with the holder’s, would be deemed to beneficially own more than 4.99% of the Common Stock; *provided, however*, the (i) holder, upon notice to us, may (2) increase or decrease this ownership limitation so long as the maximum ownership limitation does not exceed 9.99% of the Company’s Common Stock; and (ii) any increase in the ownership limitation will not become effective until the 61st day after delivery of such notice. Similarly, certain of the Series D Warrants and all the Series A Warrants provide that a selling securityholder may not exercise such warrants to the extent (but only to the extent) that the exercise thereof would result in the selling securityholder or any of its affiliates beneficially owning more than 4.9% of our Common Stock after giving effect to such exercise; *provided, however*, that in the case of any Series D Warrant with an ownership limitation, the holder may waive such ownership limitation, in which case such waiver will become effective sixty-one (61) days after the holder’s delivery of such wavier notice.

As a result, the number of shares of Common Stock reflected in this column as beneficially owned by each selling securityholder includes, to the extent applicable, (a) the shares of Common Stock that were issued in the 2016 Private Placement Financing held by such selling securityholder and/or issuable upon exercise of the Series E Warrants held by such selling securityholder which, in the case of any Series E Warrant with an ownership limitation that has not been previously waived, is limited to the number of shares of Common Stock that such selling securityholder has the right to acquire without it (along with any of its affiliates or any other persons whose beneficial ownership of Common Stock would be aggregated with the selling securityholder) beneficially owning more than 4.99% (or up to 9.99% at the securityholders' discretion) of our currently outstanding Common Stock, based on 136,707,075 outstanding shares of our Common Stock as of October 28, 2016; (b) the shares of Common Stock that were issued in the Closings conducted for the 2015 Private Placement Financing held by such selling securityholder and/or issuable upon exercise of the Series D Warrants held by such selling securityholder which, in the case of any Series D Warrant with an ownership limitation that has not been previously waived, is limited to the number of shares of Common Stock that such selling securityholder has the right to acquire without it or any of its affiliates beneficially owning more than 4.9% of our currently outstanding Common Stock, based on 136,707,075 outstanding shares of our Common Stock as of October 28, 2016; (c) the number of shares of Common Stock underlying the Series A Warrants held by such selling securityholder that such selling securityholder has the right to acquire without it or any of its affiliates beneficially owning more than 4.9% of our currently outstanding Common Stock, based on 136,707,075 outstanding shares of our Common Stock as of October 28, 2016; and (d) shares of our Common Stock beneficially owned by such selling securityholder that were acquired in transactions unrelated to the Private Placement Financings.

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 including (a) the shares of Common Stock held by such selling securityholder that were issued in connection with (3) the Closings conducted for the 2015 Private Placement Financing and/or, to the extent applicable, acquired upon the exercise of the Series D Warrants; and (b) shares of Common Stock issuable upon exercise of the Series D Warrants held by such selling securityholder, in each case without taking into account the ownership limitations set forth in the Series D Warrants as described in footnote (2).

For each selling securityholder and to the extent applicable, the totals reported in this column reflect the ownership limitations set forth in the Series A and Series E Warrants described in footnote (2), and 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 2015 Private Placement Financing and the shares of Common Stock issuable upon exercise of the (4) Series D Warrants held by such selling securityholder (in each case without taking into account the ownership limitations set forth in certain of the Series D Warrants as described in footnote (2)), are sold in this offering; and (b) the selling securityholders do not (i) sell any of the securities that have been issued to them in transactions unrelated to the 2015 Private Placement Financing (including, but not limited to, the 2016 Private Placement Financing and the 2014 Private Placement Financing) and included in Column 2; and (ii) acquire additional shares of our Common Stock after October 28, 2016 and prior to completion of this offering.

(5) Percentage ownership for each selling securityholder is determined in accordance with Section 13(d) of the Exchange Act and is based on 136,707,075 outstanding shares of our Common Stock as of October 28, 2016, and assumes that all shares underlying such selling securityholder's Series D Warrants that are being offered by such

selling securityholder by this prospectus have been issued and are outstanding.

As the managing member of Drake Partners Equity, LLC (“**Drake**”), David J. Pierce has voting and dispositive power over the securities held by Drake, which may be deemed to have beneficial ownership of 648,990 shares of Common Stock, which consists of the following: (i) 111,111 shares of Common Stock issued to Drake in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 83,333 shares of Common Stock issuable upon (6) exercise of Series E Warrants issued to Drake in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 227,273 shares of Common Stock issued to Drake in connection with the 2015 Private Placement Financing; and (iv) 227,273 shares of Common Stock issuable upon exercise of Series D Warrants issued to Drake in connection with the 2015 Private Placement Financing. Mr. Pierce disclaims beneficial ownership of the securities held by Drake that are covered hereunder except to the extent of his pecuniary interest therein.

Mr. Cornett may be deemed to have beneficial ownership of 427,274 shares of Common Stock, which consists of the following: (i) 113,637 shares of Common Stock issued to Mr. Cornett in connection with the 2015 Private (7) Placement Financing; (ii) 113,637 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. Cornett in connection with the 2015 Private Placement Financing; and (iii) 200,000 shares of Common Stock acquired by Mr. Cornett in transactions unrelated to the 2015 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part.

James R. Sulat is a member of the Company’s Board of Directors and a co-trustee of the Keyes Sulat Revocable Trust (the “**Trust**”), of which members of Mr. Sulat’s immediate family are beneficiaries. As co-trustee, Mr. Sulat has shared voting and dispositive power over the securities held by the Trust, which may be deemed to have beneficial ownership of 1,376,813 shares of Common Stock, which consists of the following: (i) 111,111 shares of Common Stock issued to the Trust in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 83,333 shares of Common Stock issuable upon exercise of Series E Warrants issued to the Trust in connection with the 2016 Private (8) Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 454,546 shares of Common Stock issued to the Trust in connection with the 2015 Private Placement Financing; (iv) 454,546 shares of Common Stock issuable upon exercise of Series D Warrants issued to the Trust in connection with the 2015 Private Placement Financing; and (v) 273,277 shares of Common Stock acquired by the Trust upon the conversion of the \$75,000 convertible promissory note that it purchased from the Company on June 19, 2013 upon the consummation of the Merger, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part. Mr. Sulat disclaims beneficial ownership of the securities held by the Trust that are covered hereunder except to the extent of his pecuniary interest therein.

The information presented for the Trust in this table excludes (a) a stock option award exercisable for 30,000 shares of Common Stock at an exercise price of \$0.37 granted to Mr. Sulat on June 18, 2013 for services rendered as a consultant to the Company; (b) a stock option award exercisable for 200,000 shares of Common Stock at an exercise price of \$0.27 granted to Mr. Sulat on August 19, 2015 upon his appointment to the Board of Directors; (c) a stock option award exercisable for 130,000 shares of Common Stock at an exercise price of \$0.39 granted to Mr. Sulat on May 3, 2016; and (d) a stock award of 30,000 shares of Common Stock granted to Mr. Sulat on May 3, 2016.

(9)

Dr. Plent may be deemed to have beneficial ownership of 989,769 shares of Common Stock, which consists of the following: (i) 138,889 shares of Common Stock issued to Dr. Plent in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 104,166 shares of Common Stock issuable upon exercise of Series E Warrants issued to Dr. Plent in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 227,273 shares of Common Stock issued to Dr. Plent in connection with the 2015 Private Placement Financing; (iv) 227,273 shares of Common Stock issuable upon exercise of Series D Warrants issued to Dr. Plent in connection with the 2015 Private Placement Financing; and (v) 192,168 shares of Common Stock and a stock option exercisable for 100,000 shares of Common Stock acquired by Dr. Plent in transactions unrelated to the Private Placement Financings, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part.

(10) Eric J. Ende is a co-trustee of the Ende Family Trust. As co-trustee, Mr. Ende has shared voting and dispositive power over the securities held by the Ende Family Trust, which may be deemed to have beneficial ownership of 250,000 shares of Common Stock, which consists of the 250,000 shares of Common Stock issuable upon exercise of Series D Warrants issued to Ende Family Trust in connection with the 2015 Private Placement Financing. Mr. Ende disclaims beneficial ownership of the securities held by the Ende Family Trust that are covered hereunder except to the extent of his pecuniary interest therein.

(11) Jonathan Symonds is the sole owner of Condorcet UK LP. As the sole owner, Mr. Symonds has sole voting and dispositive power over the securities held by Condorcet UK LP, which may be deemed to have beneficial ownership of 2,272,728 shares of Common Stock, which consists of the following: (i) 1,136,364 shares of Common Stock issued to Condorcet UK LP in connection with the 2015 Private Placement Financing; and (ii) 1,136,364 shares of Common Stock issuable upon exercise of Series D Warrants issued to Condorcet UK LP in connection with the 2015 Private Placement Financing. Mr. Symonds disclaims beneficial ownership of the securities held by Condorcet UK LP that are covered hereunder except to the extent of his pecuniary interest therein.

(12) Mr. Flaherty and Ms. Flaherty may be deemed to have beneficial ownership of 250,000 shares of Common Stock, which consists of the 250,000 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. Flaherty and Ms. Flaherty in connection with the 2015 Private Placement Financing.

(13) Ms. Malanga may be deemed to have beneficial ownership of 349,774 shares of Common Stock, which consists of the following: (i) 70,000 shares of Common Stock issued to Ms. Malanga in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 52,500 shares of Common Stock issuable upon exercise of Series E Warrants issued to Ms. Malanga in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 113,637 shares of Common Stock issued to Ms. Malanga in connection with the 2015 Private Placement Financing; and (iv) 113,637 shares of Common Stock issuable upon exercise of Series D Warrants issued to Ms. Malanga in connection with the 2015 Private Placement Financing.

(14) Mr. Galli may be deemed to have beneficial ownership of 875,000 shares of Common Stock, which consists of the following: (i) 200,000 shares of Common Stock issued to Mr. Galli in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 150,000 shares of Common Stock issuable upon exercise of Series E Warrants issued to Mr. Galli in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 275,000 shares of Common Stock issued to Mr. Galli in connection with the 2015 Private Placement Financing; and (iv) 250,000 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. Galli in connection with the 2015 Private Placement Financing.

(15) Mr. and Ms. DiFilippo may be deemed to have beneficial ownership of 227,270 shares of Common Stock, which consists of the following: (i) 113,635 shares of Common Stock issued to Mr. and Ms. DiFilippo in connection

with the 2015 Private Placement Financing; and (ii) 113,635 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. and Ms. DiFilippo in connection with the 2015 Private Placement Financing.

As the manager of Popham Management, LLC (“**Popham**”), Jerry K. Popham has voting and dispositive power over the securities held by Popham, which may be deemed to have beneficial ownership of 1,395,203 shares of Common Stock, which consists of the following: (i) 277,778 shares of Common Stock issued to Popham in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 208,333 shares of Common Stock issuable upon (16) exercise of Series E Warrants issued to Popham in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 454,546 shares of Common Stock issued to Popham in connection with the 2015 Private Placement Financing; and (iv) 454,546 shares of Common Stock issuable upon exercise of Series D Warrants issued to Popham in connection with the 2015 Private Placement Financing. Mr. Popham disclaims beneficial ownership of the securities held by Popham that are covered hereunder except to the extent of his pecuniary interest therein.

Ms. Carlin and Mr. Woodard may be deemed to have beneficial ownership of 349,774 shares of Common Stock, which consists of the following: (i) 70,000 shares of Common Stock issued to Ms. Carlin in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 52,500 shares of Common Stock issuable upon exercise of Series E (17) Warrants issued to Ms. Carlin in connection with the 2016 Private Placement Financing, none of which are being registered in this 2015 Registration Statement of which this prospectus forms a part; (iii) 113,637 shares of Common Stock issued to Ms. Carlin and Mr. Woodard in connection with the 2015 Private Placement Financing; and (iv) 113,637 shares of Common Stock issuable upon exercise of Series D Warrants issued to Ms. Carlin and Mr. Woodard in connection with the 2015 Private Placement Financing.

Mr. Lahiji may be deemed to have beneficial ownership of 300,000 shares of Common Stock, which consists of (18) the following: (i) 150,000 shares of Common Stock issued to Mr. Lahiji in connection with the 2015 Private Placement Financing; and (ii) 150,000 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. Lahiji in connection with the 2015 Private Placement Financing.

Shumeet Banerji is the general partner of Condorcet LP. As the general partner, Mr. Banerji has voting and dispositive power over the securities held by Condorcet LP, which may be deemed to have beneficial ownership of 2,272,728 shares of Common Stock, which consists of the following: (i) 1,136,364 shares of Common Stock (19) issued to Condorcet LP in connection with the 2015 Private Placement Financing; and (ii) 1,136,364 shares of Common Stock issuable upon exercise of Series D Warrants issued to Condorcet LP in connection with the 2015 Private Placement Financing. Mr. Banerji disclaims beneficial ownership of the securities held by Condorcet LP that are covered hereunder except to the extent of his pecuniary interest therein.

Mr. and Ms. Cuning may be deemed to have beneficial ownership of 400,000 shares of Common Stock, which (20) consists of the following: (i) 200,000 shares of Common Stock issued to Mr. and Ms. Cuning in connection with the 2015 Private Placement Financing; and (ii) 200,000 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. and Ms. Cuning in connection with the 2015 Private Placement Financing.

(21) Mr. McKeone may be deemed to have beneficial ownership of 1,054,926 shares of Common Stock, which consists of the following: (i) 83,334 shares of Common Stock issued to Mr. McKeone in connection with the 2016

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Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 62,500 shares of Common Stock issuable upon exercise of Series E Warrants issued to Mr. McKeone in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 454,546 shares of Common Stock issued to Mr. McKeone in connection with the 2015 Private Placement Financing; and (iv) 454,546 shares of Common Stock issuable upon exercise of Series D Warrants issued to Mr. McKeone in connection with the 2015 Private Placement Financing.

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As the manager Armor Securities LLC (“**Armor**”), Kazimierz Malik has voting and dispositive power over the securities held by Armor, which may be deemed to have beneficial ownership of 454,547 shares of Common Stock, which consists of the following: (i) 454,387 shares of Common Stock issued to Armor in connection with (22) the 2015 Private Placement Financing; and (ii) 160 shares of Common Stock issuable upon exercise of Series D Warrants issued to Armor in connection with the 2015 Private Placement Financing. Mr. Malik disclaims beneficial ownership of the securities held by Armor that are covered hereunder except to the extent of his pecuniary interest therein.

Mitchell P. Kopin (“**Mr. Kopin**”) and Daniel B. Asher (“**Mr. Asher**”), each of whom are managers of Intracoastal Capital LLC (“**Intracoastal**”), have shared voting control and investment discretion over the securities reported (23) herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Intracoastal.

Intracoastal may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of 617,286, shares of Common Stock, which consists of the following: (i) 286,241 shares of Common Stock issuable upon exercise of Series E Warrants issued to Intracoastal in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (ii) 306,045 shares of Common Stock issuable upon exercise of Series D Warrants issued to Intracoastal in connection with the 2015 Private Placement Financing; and (iii) 25,000 shares of Common Stock that became issuable under the Series A Warrant assigned to Intracoastal in May 2015 by Equitec Specialists, LLC, an affiliate of Intracoastal, as a result of the anti-dilution provisions in the Series A Warrants that were triggered by the Notes Offering.

Mr. Asher, who is a manager of Intracoastal, is also a control person of a broker-dealer. As a result of such common control, Intracoastal may be deemed to be an affiliate of a broker-dealer. Intracoastal acquired the ordinary shares being registered hereunder in the ordinary course of business, and at the time of the acquisition of the ordinary shares and warrants described herein, Intracoastal did not have any arrangements or understandings with any person to distribute such securities.

(24) Michael A. Parker is the sole manager of Tungsten III, LLC (“**Tungsten**”). As sole manager, Mr. Parker has sole voting and dispositive power over the securities held by Tungsten, which may be deemed to have beneficial ownership of 5,000,000 shares of Common Stock originally issued to Mr. Parker, an investor in the 2015 Private Placement Financing and an affiliate of Tungsten, and assigned to Tungsten in March 2016, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part. The information presented for Tungsten in Column 3 of this table excludes (i) 4,500,000 shares of Common Stock issuable upon exercise of Series D Warrants originally issued to Mr. Parker in connection with the 2015 Private Placement Financing and assigned to Tungsten in March 2016 because such warrants contain ownership limitations pursuant to which the holder is prohibited from exercising such warrants to the extent (but only to the extent) that the exercise thereof would result in the holder or any of its affiliates beneficially owning more than 4.9% of our Common Stock after giving effect to such exercise; *provided, however*, that the holder may waive such ownership limitation, in which case such waiver will become effective sixty-one (61) days after the holder’s delivery of such

wavier notice; (ii) 2,164,837 shares of Common Stock acquired by Mr. Parker in transactions unrelated to the 2015 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iii) 524,607 shares of Common Stock acquired by Ana B. Parker, Mr. Parker's spouse, in transactions unrelated to the 2015 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; (iv) 2,222,223 shares of Common Stock issued to Ms. Parker in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part; and (v) 1,666,667 shares of Common Stock issuable upon exercise of Series E Warrants issued to Ms. Parker in connection with the 2016 Private Placement Financing, none of which are being registered in the 2016 S-3 Registration Statement of which this prospectus forms a part, because of the ownership limitations set forth in the Series E Warrants as described in footnote (2).

(25) Mr. Childress may be deemed to have beneficial ownership of 684,200 shares of Common Stock, which consists of the following: (i) 455,000 shares of Common Stock issuable upon exercise of Series D Warrants originally issued to Mr. Parker, an investor in the 2015 Private Placement Financing, and assigned to Mr. Childress in March 2016; and (ii) 229,200 shares of Common Stock acquired by Mr. Childress in transactions unrelated to the 2015 Private Placement Financing, 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 and Series D Warrants issued in the 2015 Private Placement Financing as reflected in the table above and as otherwise described in this "Selling Securityholder" section below, we have not made, and are not required to make, any potential payments regarding the 2015 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, other than as described below. Additionally, none of the selling securityholders nor their affiliates holds any of our securities that have been registered under the Securities Act or that are entitled to registration rights thereunder, other than (i) the Common Stock issuable upon the exercise of the Series A Warrants held by Intracoastal that were originally issued in the 2014 Private Placement Financing; and (ii) Common Stock and/or Series E Warrants held by Ms. Carlin, Drake, Mr. Galli, Intracoastal, the Trust, Ms. Malanga, Mr. McKeone, Dr. Plent, Popham and affiliates of Tungsten that were originally issued in the 2016 Private Placement Financing. We have also been advised that none of the selling securityholders is a broker-dealer or an affiliate of a broker-dealer, other than (a) Mr. Asher, who is a manager of Intracoastal and also a control person of a broker-dealer; (b) Mr. Galli, who is employed by UBS as a financial advisor; (c) Ms. Carlin, who is employed by UBS as a financial advisor; and (d) Mr. McKeone, who is employed by FAS Corp. as a financial advisor.

The holders of the Series D Warrants issued in the 2015 Private Placement Financing have ongoing rights to exercise those Series D Warrants. We have described the material terms of the Series D Warrants elsewhere in this prospectus. In addition, the participants in the 2015 Private Placement Financing have ongoing registration rights related to the securities issued therein pursuant to the terms of the 2015 Registration Rights Agreement, which are described in more detail elsewhere in this prospectus.

We may be required to make certain payments to the investors in the 2015 Private Placement Financing under certain circumstances pursuant to the terms of the 2015 Registration Rights Agreement. These potential payments include: (i) potential partial damages for failure to register the Common Stock issued or issuable upon exercise of Series D Warrants; and (ii) payments in respect of claims for which we provide indemnification or contribution. We intend to comply with the requirements of the 2015 Registration Rights Agreement and do not currently expect to make any such payments; however, 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 October 28, 2016, we had 136,707,075 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, 5,624,845 shares of Common Stock that were issued in connection with the 2015 Private Placement Financing and outstanding as of October 28, 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**”.

Description of Series D Warrants Whose Underlying Common Stock is Registered Hereby

Each of the 2015 Investors was issued a Series D Warrant to purchase up to a number of shares of our Common Stock equal to 100% of the shares of Common Stock purchased by such 2015 Investor in the 2015 Private Placement Financing. The Series D Warrants had an initial exercise price of \$0.25 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 of the Series D Warrants is exercisable and the exercise price therefor are subject to adjustment as set forth in the Series D Warrants, including adjustments for stock subdivisions or combinations (by any stock split, stock dividend, recapitalization, reorganization, scheme, arrangement or otherwise). In addition, (i) at any time during the term of the Series D Warrants, we may reduce the then-current exercise price to any amount and for any period of time deemed appropriate by our Board; and (ii) certain of the Series D Warrants provide that they shall not be exercisable in the event and to the extent that the exercise thereof would result in the holder of the Series D Warrant or any of its affiliates beneficially owning more than 4.9% of our Common Stock, but such ownership limitation may be waived at the holder’s discretion, provided that such waiver will not become effective until the 6th day after delivery of such waiver notice. In addition, if there is no effective registration statement registering the resale of the shares of Common Stock underlying the Series D Warrants as of certain time periods (as provided in the Series D Warrants), the Series D Warrant holders may choose to exercise such Series D Warrants on a “cashless exercise” or “net exercise” basis.

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 October 28, 2016 there were issued and outstanding:

· Series A Warrants to purchase 1,125,000 shares of Common Stock issuable thereunder at an exercise price of \$0.20 per share;

· Series D Warrants to purchase 10,951,663 (10,906,663 of which have been registered for resale under this 2016 S-3 Registration Statement of which this prospectus forms a part) shares of Common Stock issuable thereunder at an exercise price of \$0.25 per share;

· Series E Warrants to purchase 6,308,323 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 D Warrants, in each case, issued originally to the 2015 Investors in the 2015 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 (October 27, 2015);

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 D 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 2015 Subscription Agreements, the 2015 Registration Rights Agreement, the Series D 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 until the earlier of (i) the date on which all of the securities registered under the registration statement of which this prospectus is a part have been sold; and (ii) the twelve month anniversary of the date the registration statement of which this prospectus is a part was declared effective by the SEC, which will occur on October 27, 2016. We have also agreed to pay all expenses of the registration of the shares of Common Stock pursuant to the registration rights agreement, estimated to be \$150,000 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 after the date of this prospectus but before 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 16,531,508 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 | \$ 1,100 |
| Legal Fees | 100,000 |
| Accounting Fees | 20,000 |
| Miscellaneous Fees and Expenses | 28,900 |
| Total | \$ 150,000 |

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

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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.

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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.

That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective (2) 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

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 (b) 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.

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 (5) 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:

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- (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.

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(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 October 31, 2016.

Arch Therapeutics, Inc.

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

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned officers and directors of Arch Therapeutics, Inc., a Nevada corporation (the "Company"), do hereby constitute and appoint each of Terrence W. Norchi and Richard E. Davis as his or her true and lawful attorney-in-fact and agent, with full power of substitution and re-substitution, for him or her and in his or her name, place, and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments, exhibits thereto and other documents in connection therewith) to this Registration Statement and any subsequent registration statement filed by the registrant pursuant to Rule 462(b) of the Securities Act of 1933, as amended, which relates to this Registration Statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto each said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that each said attorney-in-fact and agent, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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.

| SIGNATURE | TITLE | DATE |
|--|---|------------------|
| /s/ Terrence W. Norchi, MD Terrence W. Norchi, MD | President, Chief Executive Officer and Director <i>(Principal Executive Officer)</i> | October 31, 2016 |
| /s/ Richard E. Davis | Chief Financial Officer | October 31, 2016 |

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Richard E. Davis

(Principal Financial and Accounting Officer)

/s/ Avtar Dhillon MD
Avtar Dhillon, MD

Director

October 31, 2016

/s/ James R. Sulat
James R. Sulat

Director

October 31, 2016

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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 D Warrants | | 8-K | 10.2 | 000-54986 | 7/6/2015 |
| 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 (included on the signature page hereto) | X | | | | |
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