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Prospectus

**Arrowhead Research Corporation**

**19,672,390 shares of Common Stock**

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This prospectus covers the sale of an aggregate of 19,672,390 shares of our Common Stock, \$0.001 par value per share (the “Shares”), by the selling security holders identified in this prospectus (collectively with any holder’s transferee, pledgee, donee or successor, the “Selling Stockholders”). Of the Shares covered by this prospectus, i) 14,262,553 were issued in a private offering of our Common Stock and ii) 5,409,837 are issuable upon conversion of the Company’s currently outstanding Series B Preferred Stock issued in a private offering.

The Company will not receive any proceeds from the sale by the Selling Stockholders of the Shares. We are paying the cost of registering the Shares covered by this prospectus as well as various related expenses. The selling stockholders are responsible for all selling commissions, transfer taxes and other costs related to the offer and sale of their shares.

Sales of the Shares by the Selling Stockholders may occur at fixed prices, at market prices prevailing at the time of sale, at prices related to prevailing market prices, or at negotiated prices. The selling stockholders may sell shares to or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions from the selling stockholders, the purchasers of the shares, or both. If required, the number of shares to be sold, the public offering price of those shares, the names of any underwriters, broker-dealers or agents and any applicable commission or discount will be included in a supplement to this prospectus, called a prospectus supplement.

The Company’s Common Stock is traded on The NASDAQ Capital Market under the symbol “ARWR.” On May 16, 2013, the closing sale price of our Common Stock on The NASDAQ Capital Market was \$2.19 per share. Our principal executive offices are located at 225 South Lake Avenue, Suite 1050, Pasadena, California 91101, and our telephone number is (626) 304-3400.

***Investing in our securities involves a high degree of risk. You should carefully consider the Risk Factors beginning on page 2 before you invest in our securities.***

**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 May 29, 2013**

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## ABOUT THIS PROSPECTUS

You should read this prospectus, any applicable prospectus supplement and the information incorporated by reference in this prospectus before making an investment in the securities of Arrowhead Research Corporation. See “Where You Can Find Additional Information” for more information, page 7. You should rely only on the information contained in or incorporated by reference in this prospectus or a prospectus supplement. The Company has not authorized anyone to provide you with different information. This document may be used only in jurisdictions where offers and sales of these securities are permitted. You should assume that information contained in this prospectus, or in any document incorporated by reference, is accurate only as of any date on the front cover of the applicable document. Our business, financial condition, results of operations and prospects may have changed since that date.

### SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements within the meaning of the federal securities laws. You can identify forward-looking statements by the use of the words “believe,” “expect,” “anticipate,” “intend,” “estimate,” “project,” “will,” “should,” “may,” “plan,” “intend,” “assume” and other expressions which predict or indicate future events and trends and which do not relate to historical matters. You should not rely on forward-looking statements, because they involve known and unknown risks, uncertainties and other factors, some of which are beyond the control of the Company. These risks, uncertainties and other factors may cause the actual results, performance or achievements of the Company to be materially different from the anticipated future results, performance or achievements expressed or implied by the forward-looking statements.

Factors that might cause these differences include the following:

- the integration of multiple technologies and programs;
- the ability to successfully complete development and commercialization of products and the Company’s expectations regarding market growth;
- the cost, timing, scope and results of ongoing safety and efficacy trials of preclinical and clinical testing;
- the ability to successfully complete product research and further development;
- the volume and profitability of product sales of future products;
- changes in existing and potential relationships with corporate collaborators and partners;
- the availability, cost, delivery and quality of materials supplied by contract manufacturers;
- the timing, cost and uncertainty of obtaining regulatory approvals of our products;
- the ability to obtain substantial additional funding;
- the ability to develop and commercialize products before competitors that are superior to the alternatives developed by competitors;
- the ability to retain certain members of management;
- the Company’s expectations regarding research and development expenses and general and administrative expenses;
- the Company’s expectations regarding cash balances, capital requirements, anticipated revenue and expenses, including infrastructure expenses;
- our belief regarding the validity of our patents and potential litigation; and
- other factors detailed from time to time in filings with the Securities and Exchange Commission.

In addition, the factors described under the section captioned “Risk Factors” in this prospectus, as may be updated from time to time by our future filings under the Securities Exchange Act, and elsewhere in the documents

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incorporated by reference in this prospectus, may result in these differences. You should carefully review all of these factors. These forward-looking statements were based on information, plans and estimates at the date of this prospectus, and we assume no obligation to update any forward-looking statements to reflect changes in underlying assumptions or factors, new information, future events or other changes.

### **ABOUT THE COMPANY**

*Unless otherwise noted, (1) the term “Arrowhead” refers to Arrowhead Research Corporation, a Delaware corporation, (2) the terms the “Company,” “we,” “us,” and “our,” refer to the ongoing business operations of Arrowhead and its subsidiaries, whether conducted through Arrowhead or a subsidiary of the company, (3) the term “Common Stock” refers to Arrowhead’s Common Stock and (4) the term “stockholder(s)” refers to the holders of Common Stock or securities exercisable for Common Stock.*

Arrowhead Research Corporation is a clinical stage targeted therapeutics company with development programs in oncology, obesity, and chronic hepatitis B virus infection. The company is leveraging its platform technologies to design and develop peptide-drug conjugates (PDCs) that specifically home to cell types of interest while sparing off-target tissues, create targeted drugs based on the gene silencing RNA interference (RNAi) mechanism, and work with partners to create improved versions of traditional small molecule drugs.

Our stock is listed on the Nasdaq Capital Market under the symbol “ARWR”.

Our executive offices are located at 225 South Lake Avenue, Suite 1050, Pasadena CA 91101 and our telephone number is (626) 304-3400. Additional information regarding our company, including our audited financial statements and descriptions of our business, is contained in the documents incorporated by reference in this prospectus. See “Where You Can Find More Information” on page 7 and “Incorporation of Certain Information by Reference” on page 7.

### **RISK FACTORS**

We are a development-stage company and we have not yet generated significant revenues. Before making an investment decision, you should carefully consider the risks described in the sections entitled “Risk Factors” in our most recent Annual Report on Form 10-K and subsequent Quarterly Reports on form 10-Q, as filed with the SEC, which are incorporated herein by reference in their entirety, as well any amendment or updates to our risk factors reflected in subsequent filings with the SEC, including the applicable prospectus supplement. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment. This prospectus and the incorporated documents also contain forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks mentioned elsewhere in this prospectus.

### **USE OF PROCEEDS**

The proceeds from the resale of the Shares under this prospectus are solely for the account of the Selling Stockholders. We will not receive any proceeds from the sale of Shares under this prospectus.

### **SELLING SECURITYHOLDERS**

The Company has included in this prospectus 19,672,390 shares of Common Stock, which were originally issued as follows:

- 14,262,553 shares of Common Stock issued in a private offering; and
- 5,409,837 shares of Common Stock issuable upon conversion of Company Series B Preferred Stock issued in a private offering.

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In connection with the transaction, we agreed to file a registration statement with the Securities and Exchange Commission covering the resale of the shares of common stock included herein.

The following table sets forth certain information regarding the Selling Stockholders and the shares of Common Stock beneficially owned by them, which is based on information that is available to us as of May 16, 2013, including information provided by the Selling Stockholders regarding the number of shares held before the offering. Selling Stockholders may offer shares under this prospectus from time to time and may elect to sell none, some or all of the shares set forth next to their name. As a result, we cannot estimate the number of shares of Common Stock that a Selling Stockholder will beneficially own after termination of sales under this prospectus. In addition, a Selling Stockholder may have sold, transferred or otherwise disposed of all or a portion of that holder's shares of Common Stock since the date on which they provided information for this table. We have not made independent inquiries about this.

Beneficial ownership is determined in accordance with the rules and regulations of the SEC and includes voting or investment power with respect to our common stock. Shares of our common stock subject to options, warrants or convertible preferred stock that are currently exercisable or exercisable within 60 days of May 16, 2013 are considered outstanding and beneficially owned by the person holding the options, warrants or convertible preferred stock for the purpose of calculating the percentage ownership of that person but not for the purpose of calculating the percentage ownership of any other person.

All share amounts have been adjusted to reflect post-split amounts and percentages of beneficial ownership are based on 31,305,317 common shares issued and outstanding as of May 16, 2013. Shares not outstanding but deemed beneficially owned by virtue of the right of a person to acquire them as of May 16, 2013, or within sixty days of such date, are treated as outstanding only when determining the percentage owned by such individual and when determining the percentage owned by a group of which such individual is a member.

We are relying on written commitments from the Selling Stockholders to notify us of any changes in their beneficial ownership after the date they originally provided this information. See "Plan of Distribution" beginning on page 5.

<u>Selling Security Holder (1)</u>	<u>No. of Shares Held Before Offering</u>		<u>No. of Shares Being Offered</u>	<u>No. of Shares Held After Offering</u>	<u>Percentage of Shares After Offering</u>
Alta Bioequities, L.P. (2)	163,934		163,934	—	—
Aquilo Capital, L.P. (3)	1,475,410		1,475,410	—	—
Arthur J. Remillard Jr. Trust (4)	162,432	(5)	162,432	—	—
Blackwell Partners, LLC (6)	1,311,476	(7)	1,311,476	—	—
Camber Capital Fund II, LP (8)	28,513	(9)	28,513	—	—
Camber Capital Master Fund, L.P. (10)	3,634,191	(11)	3,634,191	—	—
Galloway Limited (12)	1,387,069	(13)	245,902	1,141,167	3.63%
James Mellon	452,055		245,902	206,153	*
Port Erin Biopharma Investments Limited (14)	160,165		54,902	105,263	*
RA Capital Healthcare Fund, LP (15)	5,245,902	(16)	5,245,902	—	—
Sabby Healthcare Volatility Master Fund, Ltd. (17)	2,868,139	(18)	2,185,792	682,347	2.13%
Special Situations Cayman Fund, L.P. (19)	682,855	(20)	682,855	—	—
Special Situations Fund III QP, L.P. (21)	2,267,691	(22)	2,267,691	—	—

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Special Situations Life Sciences Fund, L.P. (23)	1,092,897	(24)	1,092,897	—	—
Special Situations Private Equity Fund, L.P. (25)	328,143	(26)	328,143	—	—
Sphera Global Healthcare Master Fund (27)	664,373	(28)	546,448	117,925	*
<b>Total</b>	<b>21,925,245</b>		<b>19,672,390</b>	<b>2,252,855</b>	

\* Less than 1%.

- (1) Assumes all shares offered by the Selling Stockholders hereby are sold and that the Selling Stockholders buy or sell no additional shares of Common Stock prior to the completion of this offering.
- (2) Marc Schneidman holds investment and voting control with respect to the shares owned by Alta Bioequities, Inc.
- (3) Marc Schneidman holds investment and voting control with respect to the shares owned by Aquilo Capital, L.P.
- (4) Stephen DuBois holds investment and voting control with respect to the shares owned by the Arthur J. Remillard, Jr. Trust.
- (5) Includes 30,055 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (6) Peter Kolchinsky, sole manager of RA Capital, holds investment and voting control with respect to the shares owned by Blackwell Partners, L.C.
- (7) Includes 688,525 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (8) Stephen DuBois holds investment and voting control with respect to the shares owned by Camber Capital Fund II, LP.
- (9) Includes 5,464 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (10) Stephen DuBois holds investment and voting control with respect to the shares owned by Camber Capital Master Fund, LP.
- (11) Includes 674,863 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (12) Denham Eke holds investment and voting control with respect to the shares owned by Galloway Limited.
- (13) Includes 131,579 shares of Common Stock issuable as compensation pursuant to a services agreement.
- (14) Denham Eke holds investment and voting control with respect to the shares owned by Port Erin Biopharma Investments Limited
- (15) Peter Kolchinsky holds investment and voting control with respect to the shares owned by RA Capital Healthcare Fund L.P.
- (16) Includes 2,754,098 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (17) Hal Mintz holds investment and voting control with respect to the shares owned by Sabby Healthcare Volatility Master Fund, Ltd.

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- (18) Includes 679,347 shares of Common Stock issuable upon the exercise of a common stock purchase warrant.
- (19) Austin Marx and David Greenhouse hold investment and voting control with respect to the shares owned by Special Situations Cayman Fund, L.P.
- (20) Includes 196,175 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (21) Austin Marx and David Greenhouse hold investment and voting control with respect to the shares owned by Special Situations Fund III QP, L.P.
- (22) Includes 651,913 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (23) Austin Marx and David Greenhouse hold investment and voting control with respect to the shares owned by Special Situations Life Sciences Fund, L.P.
- (24) Includes 314,208 shares of Common Stock issuable upon the conversion of Series B Preferred Stock.
- (25) Austin Marx and David Greenhouse hold investment and voting control with respect to the shares owned by Special Situations Private Equity Fund, L.P.
- (26) Includes 94,536 shares of Common Stock issuable upon the conversion of Series B Preferred Stock
- (27) Doron Breen holds investment and voting control with respect to the shares owned by Sphera Global Healthcare Master Fund.
- (28) Includes 117,925 shares of Common Stock issuable upon the exercise of a common stock purchase warrant.

### **PLAN OF DISTRIBUTION**

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- 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 is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the selling stockholders 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 by applicable law.

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The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the 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, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

The selling stockholders also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act of 1933, provided that they meet the criteria and conform to the requirements of that rule.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be “underwriters” within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions under the Securities Act. Selling stockholders who are “underwriters” within the meaning of Section 2(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the names of the selling stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the common stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the selling stockholders and their affiliates. In addition, to the extent applicable we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.



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We have agreed to indemnify the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares offered by this prospectus.

We have agreed with the selling stockholders to keep the registration statement of which this prospectus constitutes a part effective until the earlier of (1) such time as all of the shares covered by this prospectus have been disposed of pursuant to and in accordance with the registration statement or (2) the date on which all of the shares may be sold without restriction pursuant to Rule 144 of the Securities Act.

### **EXPERTS**

The financial statements of the Company incorporated in this prospectus by reference from the Company's Annual Report on Form 10-K for the year ended September 30, 2012, have been audited by Rose, Snyder & Jacobs, LLP, as stated in their report incorporated by reference, and given upon the authority of said firm as experts in auditing and accounting.

### **LEGAL MATTERS**

Certain legal matters, including the validity of the securities offered pursuant to this registration statement, will be passed upon for us by Ropes & Gray LLP, San Francisco, California.

### **WHERE YOU CAN FIND MORE INFORMATION**

We must comply with the informational requirements of the Securities Exchange Act of 1934, as amended, and we are required to file reports and proxy statements and other information with the Securities and Exchange Commission. You may read and copy these reports, proxy statements and other information at the Public Reference Room maintained by the Securities and Exchange Commission at 100 F Street, N.E., Washington, D.C. 20549. You may also obtain copies at the prescribed rates from the Public Reference Section of the Securities and Exchange Commission at its principal office in Washington, D.C. You may call the Securities and Exchange Commission at 1-800-SEC-0330 for further information about the public reference room. The Securities and Exchange Commission also maintains a website that contains reports, proxy and information statements and other information regarding issuers like us that file electronically with the Securities and Exchange Commission. You may access the Securities and Exchange Commission's web site at <http://www.sec.gov>. We maintain a website at [www.arrowheadresearch.com](http://www.arrowheadresearch.com). The information contained in, or that can be accessed through, our website is not incorporated by reference herein and is not part of this prospectus.

Statements contained in this prospectus as to the contents of any contract or other document are not necessarily complete, and in each instance we refer you to the copy of the contract or document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference.

### **INCORPORATION OF CERTAIN INFORMATION BY REFERENCE**

The Securities and Exchange Commission allows us to incorporate by reference in this prospectus the information that we file with them. Incorporation by reference means that we can disclose important information to you by referring you to other documents that are legally considered to be part of this prospectus. Later information that we file with the Securities and Exchange Commission will automatically update and supersede the information in this prospectus, any supplement and the documents listed below. Our SEC file number is 0-21898. We incorporate by reference the specific documents listed below and any future filings made with the Securities and Exchange Commission under Section 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934, as amended, provided that all documents "furnished" by the Company to the SEC and not "filed" are not deemed incorporated by reference herein:

- The Company's Annual Report on Form 10-K for the fiscal year ended September 30, 2012, filed on December 28, 2012;
- The Company's Quarterly Reports on Form 10-Q for the quarter ended December 31, 2012, filed on February 13, 2013, and for the quarter ended March 31, 2013, filed on May 9, 2013;

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- The Company's Current Reports on Form 8-K filed on December 12, 2012, January 30, 2013, March 25, 2013, and May 1, 2013; and
- The description of the Company's common stock contained in its registration statement on Form 8-A/A (Registration No. 000-21898), filed on November 1, 2010, including any amendments or reports filed for the purpose of updating such description.

We will furnish without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request, a copy of any document incorporated by reference. Requests should be addressed to Corporate Secretary, 225 South Lake Street, Suite 1050, Pasadena, CA 91101 or may be made telephonically at (626) 304-3400.

You should rely only on the information incorporated by reference or provided in this prospectus or any prospectus supplement. We have not authorized anyone to provide you with different information. You should not assume that the information contained in this prospectus or the accompanying prospectus supplement is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus and any accompanying prospectus supplement is delivered or securities are sold on a later date.