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

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**FORM S-3  
REGISTRATION STATEMENT**  
*UNDER  
THE SECURITIES ACT OF 1933*

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**ARROWHEAD RESEARCH CORPORATION**

(Exact name of Registrant as Specified in Its Charter)

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**Delaware**  
(State of Incorporation)

**46-0408024**

(I.R.S. Employer Identification Number)

**225 South Lake Avenue, Suite 300  
Pasadena, CA 91101  
626-304-3400**

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

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**Christopher Anzalone, Chief Executive Officer  
Arrowhead Research Corporation  
225 South Lake Avenue, Suite 300  
Pasadena, CA 91101  
626-304-3400**

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

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*Copies to:*

**Ryan Murr  
Ropes & Gray LLP  
Three Embarcadero Center  
San Francisco, CA 94111  
(415) 315-6300**

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**Approximate Date of Commencement of Proposed Sale to the Public:** From time to time after this Registration Statement becomes effective, as determined by the Selling Stockholders.

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

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

If this Form is used 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

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**CALCULATION OF REGISTRATION FEE**

<b>Title of Each Class of Securities to be Registered</b>	<b>Amount to be Registered(1)</b>	<b>Proposed Maximum Offering Price per Share(2)</b>	<b>Proposed Maximum Aggregate Offering Price(2)</b>	<b>Amount of Registration Fee</b>
Common Stock, par value \$.001 per share	1,855,635	\$6.03	\$11,189,479	\$1282.31

- (1) Pursuant to Rule 416 of the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement also covers such additional securities as may become issuable to prevent dilution resulting from stock splits, stock dividends and similar events.
- (2) Pursuant to Rule 457(c), calculated on the basis of the average of the high and low prices per share of the Registrant's Common Stock reported on the NASDAQ Capital Market on November 17, 2011.

**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, as amended, or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.**

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

**Subject to Completion, dated November 18, 2011**

Prospectus

# Arrowhead Research Corporation

## 1,855,635 shares of Common Stock

This prospectus covers the sale of an aggregate of 1,855,635 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) 901,702 were issued in connection with an acquisition by the Company of Roche’s RNAi business, which closed on October 21, 2011, ii) 675,000 were issued in a private offering of the our Common Stock and iii) 278,933 are issuable upon conversion of the Company’s currently outstanding Series A Preferred Stock issued in a private offering, including 11,832 shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012.

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 November 17, 2011, the closing sale price of our Common Stock on The NASDAQ Capital Market was \$6.03 per share. Our principal executive offices are located at 225 South Lake Avenue, Suite 300, 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 \_\_\_\_\_, 2011

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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.

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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 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 Research” refers to Arrowhead Research Corporation, a Delaware corporation, formerly known as InterActive Group, Inc., (2) the terms “Arrowhead,” the “Company,” “we,” “us,” and “our,” refer to the ongoing business operations of Arrowhead and its subsidiaries, whether conducted through Arrowhead Research or a subsidiary of the company, and (3) the term “Common Stock” refers to shares of Arrowhead Research’s Common Stock and the term “stockholder(s)” refers to the holders of Common Stock or securities exercisable for Common Stock.*

Arrowhead Research Corporation is a nanomedicine company developing innovative therapeutic products at the interface of biology and nanoengineering to cure disease and improve human health. Arrowhead addresses its target markets through ownership in subsidiaries that are selected based on synergies in their technology, and clinical and business strategies. By focusing on specific related applications of nanomedicine, Arrowhead and its subsidiaries leverage shared expertise and resources to develop pioneering therapeutic platforms for large unmet medical needs. Arrowhead is a leader in delivering small RNAs for gene silencing, and has programs in anti-obesity therapeutics and regenerative medicine.

Arrowhead’s portfolio includes Arrowhead Madison, an RNAi therapeutics research company, two majority owned subsidiaries, Calando Pharmaceuticals, Inc., a leader in delivering small RNAs for gene silencing and Ablaris Therapeutics, Inc. (“Ablaris”), an anti-obesity therapeutics company and minority investments in Nanotope, Inc., a regenerative medicine company and Leonardo Biosystems, Inc., a multistage drug delivery company.

Our stock is currently listed on the Nasdaq Capital Market under the symbol “ARWRD” to reflect a reverse split on November 17, 2011. The symbol will revert to ARWR on or about December 16, 2011.

Our executive offices are located at 225 South Lake Avenue, Suite 300, 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 limited historical operations. 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.

***We recently acquired significant assets from Roche related to RNAi technologies, and Roche retains a right of first negotiation over certain candidates developed based on the acquired RNAi technologies.***

On October 21, 2011, we entered into a Stock and Asset Purchase Agreement with Hoffmann-La Roche Inc. and F. Hoffmann-La Roche Ltd, pursuant to which we purchased from Roche (i) all of the outstanding common stock of Roche Madison Inc. and (ii) the intellectual property rights currently held by Roche related to its RNAi

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business and identified in the RNAi Purchase Agreement. Pursuant to the RNAi purchase agreement, Roche has a limited right of first negotiation on certain product candidates developed by us relating to the purchased assets. This right of first negotiation applies to all three Existing Candidates (disease targets previously studied by Roche) and to up to five other drug candidates that we may develop. The right of first negotiation could delay the process of entering into a strategic relationship related to any product candidates developed based on the acquired RNAi technologies and could adversely impact our ability to attract a partner or acquirer for any such product candidates and could negatively impact the prospects for a larger company to acquire Arrowhead.

### ***Our use of cash will increase compared to recent historical periods.***

Our plan of operations is to provide substantial amounts of development funding and financial support to our subsidiaries over an extended period of time. With the recent acquisition of Roche's RNAi business, including a research facility in Madison, WI and 43 new employees, our use of cash is expected to substantially increase compared to recent historical periods. We will need to obtain additional capital to further our development efforts, and we intend to seek additional capital by out-licensing technology, securing funded partnerships, conducting one or more private or public offerings of equity securities of the Company or our subsidiaries, or through a combination of one or more of such financing alternatives. However, there can be no assurance that we will be successful in any of these endeavors or, if we are successful, that such transactions will be accomplished on favorable terms. If we are unable to obtain additional capital, we will implement cash saving measures, which could materially harm our business and our ability to achieve cash flow in the future, including delaying or reducing implementation of certain aspects of our plan of operations. Even if we are successful in obtaining additional capital, because we and each subsidiary are separate entities, it could be difficult or impossible to allocate funds in a way that meets the needs of all entities.

## **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 1,855,635 shares of Common Stock, which were originally issued as follows:

- 901,702 shares issued in connection with the acquisition of Roche's RNAi business;
- 675,000 shares issued pursuant to a private offering of Common Stock; and
- 278,933 shares of Common Stock issuable upon conversion of Company Series A Preferred Stock issued in a Private Offering, including 11,832 shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, which conversion is contingent on stockholder approval.

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

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 November 17, 2011. 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.

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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 or warrants that are currently exercisable or exercisable within 60 days of November 17, 2011 are considered outstanding and beneficially owned by the person holding the options or warrants 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.

The Company implemented a 1 for 10 reverse split of its common stock on November 17, 2011. All share amounts have been adjusted to reflect post-split amounts and percentages of beneficial ownership are based on 10,526,072 common shares issued and outstanding as of November 17, 2011. Shares not outstanding but deemed beneficially owned by virtue of the right of a person to acquire them as of November 17, 2011, 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># of Shares held before Offering</u>	<u># Shares Being Offered</u>	<u># of Shares held after Offering(2)</u>	<u>Percentage of Shares After Offering(2)</u>
Steve Boyd	202,268(3)	16,489	185,779	1.75%
M. Robert & Phyllis Ching	1,788,696(4)	137,418	1,651,278	9.99%
Bob G. Gower	163,745(5)	68,709	95,036	*
Kyle B. Mansfield	33,741(6)	13,741	20,000	*
Dennis McCormick	27,461(7)	27,461	—	—
Jeffrey Rahm	32,279(8)	15,115	17,164	*
Roche Finance Ltd.	901,702(9)	901,702	—	—
Vermögensverwaltungs-Gesellschaft Zurich “(VGZ)”	675,000(10)	675,000	—	—

\* Less than 1%.

- (1) If required, information about other selling security holders, except for any future transferees, pledgees, donees or successors of selling security holders named in the table above, will be set forth in a prospectus supplement or amendment to the registration statement of which this prospectus is a part. Additionally, post-effective amendments to the registration statement will be filed to disclose any material changes to the plan of distribution from the description contained in the final prospectus.
- (2) 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.
- (3) Includes 118,370 shares and 67,409 shares issuable upon exercise of common stock purchase warrants. Also includes 16,489 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval.
- (4) Includes 793,611 shares and 857,667 shares issuable upon the exercise of common stock purchase warrants, of which 45,600 shares and 18,240 shares issuable upon the exercise of common stock purchase warrants held by BBB Assets for which M. Robert Ching holds investment and voting control. Also includes 137,418 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval. Certain of the warrants and the conversion of the preferred stock are subject to a contractual blocker whereby the right to exercise or convert such warrant or preferred stock is limited such that Dr. and Mrs. Ching will not have greater than 9.99% beneficial ownership of the outstanding common stock.
- (5) Includes 68,709 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval.



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- (6) Includes 13,741 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval.
- (7) Includes 27,461 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval.
- (8) Includes 15,115 shares of common stock issuable upon conversion of Series A Preferred Stock, including additional shares of Series A Preferred Stock issuable in in-kind distribution as payment of dividends through March 31, 2012, conversion of which is subject to stockholder approval.
- (9) Carole Nuechterlein, Head of Roche Venture Fund, holds voting and investment control with respect to the shares owned by Roche Finance, Ltd.
- (10) Markus Winkler, President of the Board of VGZ, holds voting and investment control with respect to the shares owned by VGZ.

### **PLAN OF DISTRIBUTION**

The Shares offered by this prospectus may be sold by the Selling Stockholders from time to time at their discretion. Such sales may be made at fixed prices that may be changed, at market prices prevailing at the time of sale, at prices related to such prevailing market prices, or at negotiated prices, and may be made in the over-the-counter market or any exchange on which our common stock may then be listed, or otherwise. In addition, the Selling Stockholders may sell some or all of their Shares through:

- a block trade in which a broker-dealer may resell a portion of the block, as principal, in order to facilitate the transaction;
- purchases by a broker-dealer, as principal, and resale by the broker-dealer for its account;
- ordinary brokerage transactions and transactions in which a broker solicits purchasers;
- in negotiated transactions;
- in a combination of any of the above methods of sale; or
- any other method permitted under applicable law.

The Selling Stockholders may also engage in short sales against the box, puts and calls and other hedging transactions in the Shares or derivatives of the Shares and may sell or deliver the Shares in connection with these trades. For example, the Selling Stockholders may:

- enter into transactions involving short sales of our common stock by broker-dealers;
- sell our common stock short themselves and redeliver such shares to close out their short positions;
- enter into option or other types of transactions that require the Selling Stockholder to deliver shares of common stock to a broker-dealer, who will then resell or transfer the common stock under this prospectus; or
- loan or pledge shares of common stock to a broker-dealer, who may sell the loaned shares or, in the event of default, sell the pledged shares.
- There is no assurance that any of the Selling Stockholders will sell any or all of the Shares offered by them.

The Selling Stockholders may negotiate and pay broker-dealers commissions, discounts or concessions for their services. Broker-dealers engaged by the Selling Stockholders may allow other broker-dealers to participate in resales. However, the Selling Stockholders and any broker-dealers involved in the sale or resale of our common stock may qualify as “underwriters” within the meaning of the Section 2(a)(11) of the Securities Act. In addition,

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the broker-dealers' commissions, discounts or concessions may qualify as underwriters' compensation under the Securities Act. If the Selling Stockholders qualify as "underwriters," they will be subject to the prospectus delivery requirements of the Securities Act.

In addition to selling their shares of common stock under this prospectus, the Selling Stockholders may:

- transfer their common stock in other ways not involving market makers or established trading markets, including, but not limited to, directly by gift, distribution, privately negotiated transactions in compliance with applicable law or other transfer; or
- sell their common stock under Rule 144 of the Securities Act rather than under this prospectus, if the transaction meets the requirements of Rule 144. Each Selling Stockholder will bear all expenses with respect to the offering of common stock by such Selling Stockholder.

Under the applicable rules and regulations of the Exchange Act, any person engaged in the distribution of the Shares may not simultaneously engage in market making activities with respect to our common stock for a period of two business days prior to the commencement of such distribution. In addition, each Selling Stockholder will be subject to the applicable provisions of the Exchange Act and the associated rules and regulations under the Exchange Act, including Regulation M, which provisions may limit the timing of purchases and sales of shares of our common stock by the Selling Stockholders.

The Selling Stockholders may from time to time pledge or grant a security interest in some or all of the Shares owned by them and, if they default in the performance of their secured obligations, the pledges or secured parties may offer and sell the Shares from time to time under this prospectus after an amendment has been filed under Rule 424(b)(3) or other applicable provision of the Securities Act of 1933 amending the list of Selling Stockholders to include the pledge, transferee or other successors in interest as selling stockholders under this prospectus.

The Selling Stockholders also may transfer the Shares in other circumstances, in which case the respective pledgees, donees, transferees or other successors in interest will be the selling beneficial owners for purposes of this prospectus and may sell the Shares from time to time under this prospectus after an amendment has been filed under Rule 424(b)(3) or other applicable provision of the Securities Act amending the list of Selling Stockholders to include the pledge, transferee or other successors in interest as selling stockholders under this prospectus.

We will make copies of this prospectus available to the Selling Stockholders and have informed them of the need to deliver copies of this prospectus to purchasers at or prior to the time of any sale of the Shares.

We will bear all costs, expenses and fees in connection with the registration of the Shares. The Selling Stockholders will bear all commissions and discounts, if any, attributable to the resale of the Shares. The Selling Stockholders may agree to indemnify any broker-dealer or agent that participates in transactions involving sales of the Shares against certain liabilities, including liabilities arising under 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, 2010, have been audited by Rose, Snyder & Jacobs, a corporation of Certified Public Accountants, 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, until all of the shares of common stock and warrant shares covered by this prospectus are sold:

- The Company's Annual Report on Form 10-K for the fiscal year ended September 30, 2010, filed on December 22, 2010;
- The Company's Quarterly Reports on Form 10-Q for the fiscal quarter ended December 31, 2010, filed on February 10, 2011, for the fiscal quarter ended March 31, 2011, filed on May 12, 2011 and for the fiscal quarter ended June 30, 2011, filed on August 8, 2011;
- The Company's Definitive Proxy Statement on Schedule 14-A, filed on June 27, 2011;
- The Company's Current Reports on Form 8-K filed on November 30, 2010, December 9, 2010, December 14, 2010, December 20, 2010, January 14, 2011, January 21, 2011, January 24, 2011, February 3, 2011, April 5, 2011, May 12, 2011, June 9, 2011, August 8, 2011, August 9, 2011, October 6, 2011, October 26, 2011, October 27, 2011, November 15, 2011 and November 17, 2011;
- 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; and
- All documents filed by the Company pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, after the date of the original Registration Statement and prior to effectiveness of the registration statement of which this prospectus is a part, provided that all documents "furnished" by the Company to the SEC and not "filed" are not deemed incorporated by reference herein.

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 300, 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

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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.

**PART II**  
**INFORMATION NOT REQUIRED IN PROSPECTUS**

**Item 14. Other Expenses of Issuance and Distribution (1).**

The following are the estimated expenses of the distribution of the shares registered hereunder on Form S-3:

Registration Fee—Securities and Exchange Commission	\$ 1,282
Accountants Fees and Expenses	\$10,000
Legal Fees and Expenses	\$10,000
Miscellaneous	\$10,000
Total	<u>\$31,282</u>

(1) The amounts set forth below, except for the SEC Registration Fee, are estimated.

**Item 15. Indemnification of Directors and Officers.**

The Company's Certificate of Incorporation provides for the elimination of personal monetary liability of directors to the fullest extent permissible under Delaware law. Delaware law does not permit the elimination or limitation of director monetary liability for: (i) breaches of the director's duty of loyalty to the corporation or its stockholders; (ii) acts or omissions not in good faith or involving intentional misconduct or knowing violations of law; (iii) the payment of unlawful dividends or unlawful stock repurchases or redemptions or (iv) transactions in which the director received an improper personal benefit.

Section 145 of the Delaware General Corporation Law permits a Delaware corporation to indemnify, on certain terms and conditions, 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, 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 such action. The Certificate of Incorporation and Bylaws of the Company require the Company to indemnify the Company's directors and officers to the fullest extent permitted under Delaware law.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Company pursuant to the foregoing provisions, the Company has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

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### Item 16. Exhibit Index.

<u>Exhibit No.</u>	<u>Description</u>
4.1	Form of Common Stock Certificate (1)
5.1	Opinion of Ropes & Gray LLP**
23.1	Consent of Rose, Snyder & Jacobs, the registrant's independent registered public accounting firm**
23.2	Consent of Ropes & Gray LLP (included in legal opinion filed as Exhibit 5.1)**
24.1	Power of Attorney (included on signature page)**

\*\* Filed herewith.

(1) Incorporated by reference from Amendment No. 2 to the Registration Statement on Form S-1, filed by the registrant on September 11, 2009.

### Item 17. Undertakings.

Item 512(a) of Regulation S-K. 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:
  - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;
  - (ii) 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 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
  - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*Provided, however, That:*

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

- (2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

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

*Item 512(b) of Regulation S-K.* The undersigned registrant hereby undertakes 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 Section 15(d) of the Securities Exchange Act of 1934, as amended (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.

*Item 512(h) of Regulation S-K.* 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 foregoing 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

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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 Pasadena, state of California, on November 18, 2011.

**ARROWHEAD RESEARCH CORPORATION**

By:           /s/ Christopher Anzalone            
Christopher Anzalone  
Chief Executive Officer

**POWER OF ATTORNEY**

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, each of whom also constitutes and appoints Christopher Anzalone and Kenneth A. Myszkowski, and each of them singly, his or her true and lawful attorney-in-fact and agent, for him or her, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Registration Statement, and to file the same and all exhibits thereto and any other documents in connection therewith with the Securities and Exchange Commission, granting unto each 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, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that each attorney-in-fact and agent or his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>          /s/ Christopher Anzalone          </u> Christopher Anzalone	Chief Executive Officer and President and Director (Principal Executive Officer)	November 18, 2011
<u>          /s/ R. Bruce Stewart          </u> R. Bruce Stewart	Executive Chairman of the Board	November 18, 2011
<u>          /s/ Kenneth A. Myszkowski          </u> Kenneth A. Myszkowski	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	November 18, 2011
<u>          /s/ Edward W. Frykman          </u> Edward W. Frykman	Director	November 18, 2011
<u>          /s/ Charles P. McKenney          </u> Charles P. McKenney	Director	November 18, 2011
<u>          /s/ Mauro Ferrari          </u> Mauro Ferrari	Director	November 18, 2011
<u>          /s/ Douglass Given          </u> Douglass Given	Director	November 18, 2011

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**EXHIBIT INDEX.**

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\*\* Filed herewith.

(1) Incorporated by reference from Amendment No. 2 to the Registration Statement on Form S-1, filed by the registrant on September 11, 2009.



ROPES & GRAY LLP  
THREE EMBARCADERO CENTER  
SAN FRANCISCO, CA 94111-4006  
WWW.ROPESGRAY.COM

November 18, 2011

Arrowhead Research Corporation  
225 South Lake Avenue, 3<sup>rd</sup> Floor  
Pasadena, CA 91101

Ladies and Gentlemen:

This opinion letter is furnished to you in connection with your filing of a Registration Statement on Form S-3 (the "Registration Statement"), with the Securities and Exchange Commission under the Securities Act of 1933, as amended, for the registration of up to 1,855,635 shares of Common Stock, \$0.001 par value per share, of Arrowhead Research Corporation, a Delaware corporation (the "Company"), composed of: (i) 901,702 shares issued in connection with the acquisition of the RNAi business of Hoffmann-La Roche Inc. and F. Hoffmann-La Roche Ltd, which acquisition closed on October 21, 2011 (the "Roche Shares"), (ii) 675,000 shares issued by the Company pursuant to a private offering of Common Stock (the "PIPE Shares" and together with the Roche Shares, the "Common Shares"), (iii) 267,101 shares of Common Stock issuable upon conversion of 1,015 shares of Series A Preferred Stock (the "Series A Preferred Stock") issued by the Company on October 26, 2011 (the "Conversion Shares"), which conversion is contingent upon receipt of stockholder approval, and (iv) 11,832 shares of Common Stock (the "Dividend Shares") underlying additional shares of Series A Preferred Stock potentially issuable as an in-kind dividend on the Series A Preferred Stock through March 31, 2012 (the "PIK Shares").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions expressed below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinions set forth below, on certificates of officers of the Company.

The opinion expressed below is limited to the Delaware General Corporation Law (which includes applicable provisions of the Delaware Constitution and reported judicial decisions interpreting the Delaware General Corporation Law and the Delaware Constitution).

Based on the foregoing, we are of the opinion that: (i) the Common Shares have been duly authorized and are validly issued, fully paid and non-assessable, (ii) the Conversion Shares have been duly authorized and, upon receipt of stockholder approval for their issuance upon conversion of the Series A Preferred Stock and the issuance of the Conversion Shares in accordance with the terms of the Series A Preferred Stock Certificate of Designations, Preferences and Rights, will be validly issued, fully paid and non-assessable; and (iii) upon the valid issuance of the PIK Shares as a dividend on the Series A Preferred Stock and the conversion of the PIK Shares into Common Stock, the Dividend Shares will be duly authorized, validly issued, fully paid and non-assessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement and to the references to our firm under the caption "Legal Matters" in the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ Ropes & Gray LLP

Ropes & Gray LLP

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the incorporation by reference, in this Registration Statement on Form S-3 of our report dated December 17, 2010, with respect to the consolidated financial statements of Arrowhead Research Corporation and Subsidiaries appearing in the Company's Annual Report on Form 10-K for the year ended September 30, 2010, and to the reference of our Firm under the caption "Experts" in the Registration Statement.

/s/ Rose, Snyder & Jacobs

Rose, Snyder & Jacobs  
A Corporation of Certified Public Accountants

Encino, California  
November 16, 2011