

ARROWHEAD RESEARCH CORP
Form 424B3
September 17, 2009
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Registration No. 333-161344

PROSPECTUS

ARROWHEAD RESEARCH CORPORATION

9,196,642 shares of Common Stock

This prospectus covers the sale of an aggregate of 9,196,642 shares of our Common Stock, \$0.001 par value per share (the **Common Stock**), by the selling security holders identified in this prospectus (collectively with any holder's transferee, pledgee, donee or successor, the **Selling Stockholders**). The Common Stock covered by this prospectus consists of shares of Common Stock (**Shares**) issued in a private placement that closed on July 17, 2009 and August 6, 2009 (the **Private Placement**).

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. If required, the number of Shares to be sold, the public offering price of those Shares, the names of any broker-dealers 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 September 15, 2009, the closing sale price of our Common Stock on the NASDAQ Capital Market was \$0.71 per share. Our principal executive offices are located at 201 South Lake Avenue, Suite 703, Pasadena, California 91101, and our telephone number is (626) 304-3400.

Investing in our securities involves risks. You should carefully consider the risk factors beginning on page 3 of this prospectus before you make an investment 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 September 15, 2009

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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 20. 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.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into it contain forward-looking statements that involve risks and uncertainties. The statements contained or incorporated by reference in this prospectus that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the **Securities Act**) and Section 21E of the Securities Exchange Act of 1934, as amended (the **Exchange Act**). The Company has made these statements in reliance on the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements relate to future events or our future performance and include, but are not limited to; statements concerning our business strategy, future research and development projects, potential commercial revenues, capital requirements, new potential product introductions, expansion plans and the Company's funding requirements. Other statements contained in our filings that are not historical facts are also forward-looking statements. The Company has tried, wherever possible, to identify forward-looking statements by terminology such as *may*, *will*, *could*, *should*, *expects*, *anticipates*, *intends*, *plans*, *believes*, *seeks*, *estimates* terminology.

Forward-looking statements are not guarantees of future performance and are subject to various risks, uncertainties and assumptions that are difficult to predict. Actual results may differ materially from those anticipated in these forward-looking statements as a result of a number of factors, including the risk factors described below in this prospectus and in our periodic filings with the SEC, incorporated by reference or included in this prospectus. All forward-looking statements contained in this prospectus are made only as of the date on the prospectus cover. We expressly disclaim any intent to update or alter our forward-looking statements, whether as a result of new information, future events or otherwise. Before deciding to buy or sell our securities, you should be aware that the occurrence of the events described in these risk factors could harm our business, operating results and financial condition, which consequences could materially diminish the trading price of our securities and/or their value.

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PROSPECTUS SUMMARY

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.

Our Business

Arrowhead is a development stage nanotechnology holding company that seeks to create stockholder value through the creation and operation of nanotechnology companies. Arrowhead currently owns two majority-owned subsidiaries, Unidym, Inc. (Unidym) and Calando Pharmaceuticals, Inc. (Calando), two wholly-owned subsidiaries, Tego BioSciences Corporation (Tego) and Agonn Systems, Inc. (Agonn) and has minority investments in two early-stage nanotechnology companies, Nanotope, Inc. and Leonardo Biosystems, Inc. (LBS). Arrowhead's mission is to build value through the identification, development and commercialization of nanotechnology-related products and applications. Arrowhead is active in the operation of its subsidiaries, providing key management to the subsidiaries. The Company is currently focused primarily on its lead subsidiary, Unidym, which anticipates initial sales of its transparent conductive materials into commercial markets in the near term. Arrowhead expects to allocate relatively little current capital to its other subsidiaries while maintaining the opportunity to obtain value from their technologies. The Company's three other majority-owned subsidiaries have shifted from operating activities to licensing/partnering models. The two minority holdings are separately financed. Unidym's products are intended to replace a key material used in touch panels, LCD displays, and thin-film solar cells. Arrowhead's business plan includes adding to its portfolio through selective acquisition and formation of new companies, as capital resources allow.

Our common stock is quoted on the NASDAQ Capital Market under the symbol ARWR .

Recent Developments

Sale and License of Calando Assets

On June 23, 2009, the Company's majority owned subsidiary, Calando, completed transactions with Cerulean Pharma, Inc. whereby Calando licensed its CyclosetTM drug delivery platform and its clinical candidate, IT-101, for an upfront payment of \$2.4 million and future milestone and royalty payments. To facilitate the completion of the transactions, holders of an aggregate of \$2.9 million of Calando Unsecured Convertible Promissory Notes (including \$830,000 belonging to the Company) converted principal and interest into a newly authorized Calando Series A Preferred Stock.

Amendment of TEL VC Arrangement

On June 25, 2009, the Company's majority owned subsidiary, Unidym, and TEL Ventures, Inc. (TEL VC), agreed to postpone and modify certain put rights associated with TEL VC's purchase of Unidym Series C-1 Preferred Stock in November 2008. The existence of the put rights necessitated the classification of TEL VC's Preferred Stock Ownership as a liability rather than equity on the Company's consolidated balance sheet. Also on June 25, 2009, the Company and TEL VC agreed to exchange 75% of TEL VC's Series C-1 Preferred Stock for an equal number of shares of restricted Company common stock, valued at approximately \$1.0 million, reducing permanently the number of shares available to TEL VC for put to Unidym.

On July 31, 2009, Unidym met the requirements for the waiver of the remaining TEL VC put rights. The waiver will result in the reclassification of the \$500,000 liability to equity which will be reflected in the Company's results for the quarter and the year ended September 30, 2009.

Nasdaq Compliance

On August 10, 2009, the Company reported \$3.7 million in stockholders' equity in its Quarterly Report on Form 10-Q for the quarter ended June 30, 2009. On August 11, 2009, the Company received a letter from NASDAQ stating that the Company is now in compliance with the minimum stockholders' equity requirement.

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Change in Executive Management

On August 12, 2009, as previously planned and disclosed, Paul C. McDonnel resigned as the Company's Chief Executive Officer. Mr. Joseph T. Kingsley, former President and Chief Financial Officer, was appointed to as Interim Chief Financial Officer.

The Offering

This prospectus relates to the resale by the Selling Stockholders identified in this prospectus of up to 9,196,642 shares of Common Stock, all of which shares are issued and outstanding as of the date of this prospectus. All of the Shares, when sold, will be sold by the Selling Stockholders. The Selling Stockholder may sell their Shares from time to time at market prices prevailing at the time of sale, at prices related to the prevailing market price, or at negotiated prices. We will not receive any proceeds from the sale of Shares by the Selling Stockholders.

Corporate Information

Our executive offices are located at 201 South Lake Avenue, Suite 703 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 Additional Information" on page 20 and "Information Incorporated by Reference" on page 20.

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RISK FACTORS

We are a development stage company and we have limited historical operations. We urge you to consider our likelihood of success and prospects in light of the risks, expenses and difficulties frequently encountered by entities at our current stage of development.

Risks Related to Our Financial Condition

We do not have sufficient cash reserves to fund our activities at their current pace for the next fiscal year.

Our plan of operations is to provide substantial amounts of development funding and financial support for our majority-owned subsidiaries over an extended period of time. Our Board of Directors adopted a cash conservation strategy that scaled back our financial support for our majority owned subsidiaries, Unidym, Inc. (Unidym) and Calando Pharmaceuticals, Inc. (Calando). This reduction in financial support has influenced Unidym's decision to partner its capital-intensive bulk CNT manufacturing and concentrate its resources on its CNT inks and CNT-based film products. Calando's Board of Directors has determined to partner future development efforts for its drug delivery platforms and clinical candidates. We will need to obtain additional capital in the near term to support our projects, and we may plan to do so by out-licensing technology, selling one or more of our subsidiaries, securing funded partnerships, conducting one or more private placements of equity securities of the Company or our subsidiaries, selling additional securities in a registered public offering, 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 be required to implement additional cash saving measures by limiting further activities at Unidym, Calando, or at the Company, 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.

A substantial portion of Unidym's intellectual property is licensed from Rice University and the Rice license includes an insolvency provision.

Through its merger with Carbon Nanotechnologies, Inc. (CNI), Unidym acquired a license to certain intellectual property from Rice University. Under the license, Unidym must meet a solvency test in order to retain the rights to the licensed technology. Although Unidym is not insolvent at this time, if Unidym does not obtain additional capital, it is likely that it would become insolvent and the Rice license would be subject to potential termination. If the Rice license terminates, Unidym would lose exclusivity in the fields of use covered by the Rice license and its business would be materially and irrevocably harmed. In this case, the likelihood that the Company would realize any return on its investment in Unidym would be substantially diminished, if not eliminated entirely. This lack of exclusivity would likely materially and irrevocably harm the value of the Company.

The current financial market conditions may exacerbate certain risks affecting our business.

Neither the Company nor our subsidiaries generate substantial revenue, and, to date, our operations, research and development activities have been primarily funded through the sale of Company securities and securities of our subsidiaries. Current market conditions are likely to impair our ability to raise the capital we need. If we are unable to secure additional cash resources from the sale of securities or other sources, it could become necessary to further slow, interrupt or close down development efforts at Unidym. In addition, we may have to make additional cuts in expenses at the Company, which could impair our ability to manage our business and our subsidiaries. If investment capital is available to us, in the current market the terms may be onerous. If investment capital is needed and available to Unidym, Calando and the Company does not have the funds to make a pro rata investment, our ownership interest could be significantly diluted. The sale of additional Company stock to fund operations could result in significant dilution to stockholders.

The strategy for eventual monetization of our subsidiaries will likely depend on our ability to exit our ownership position in each subsidiary in an orderly manner. Exit opportunities could include an initial public offering (IPO) for the subsidiary or acquisition of

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the subsidiary by another company. Due to the current economic climate, companies are adopting conservative acquisition strategies and, even if there is interest, may not be able to acquire our subsidiaries on attractive terms, if at all. These factors could reduce the realizable return on our investment if we are able to sell a subsidiary. Additionally, the market for IPOs is severely limited, which limits public exit opportunities for our subsidiaries.

Our business may be harmed if we cannot maintain our listing on the NASDAQ Capital Market.

To maintain our listing on the NASDAQ Capital Market we must satisfy certain minimum financial and other continued listing standards, including, among other requirements, (i) a \$1.00 minimum bid price requirement and (ii) a \$2.5 million minimum stockholders' equity requirement, \$500,000 minimum net income requirement or \$35 million minimum market value of listed securities requirement. As of August 12, 2009, the bid price of our Common Stock was \$0.43 per share and our market value for listed securities was approximately \$19.9 million. Further, as reported in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2009, at June 30, 2009 our stockholders' equity was \$3.7 and our net loss was \$27 million for the fiscal year ended September 30, 2008. We had previously received a notice of non-compliance from NASDAQ regarding our stockholders' equity, which has since been resolved. However, we may face deficiencies in our stockholders' equity in the future and if we cannot resolve such deficiencies, our Common Stock could be delisted from the NASDAQ Capital Market. Additionally, as of August 3, 2009, NASDAQ reinstated the \$1.00 minimum bid requirement for continued listing. As a result, we may need to effect a reverse stock split to get our stock price over \$1.00. There is no assurance that such a reverse stock split would be effective and stockholders may suffer a decline in value of their shares as many stocks do not trade at or above the implied post-split price.

In addition, because of cash constraints, we may have to go dark and stop filing reports with the SEC. If we stop filing reports with the SEC, that would negatively affect our stockholders' ability to sell their shares, including the shares being sold in this offering. In addition, we would be under breach of certain agreements if we stop filing reports with the SEC, which would expose us to potential legal action.

If our Common Stock is delisted by, or we voluntarily delist from, NASDAQ, our Common Stock may be eligible to trade on the OTC Bulletin Board or the Pink OTC Markets. In such an event, it could become more difficult to dispose of, or obtain accurate quotations for the price of our Common Stock, and there would likely also be a reduction in profile in the investment community and the news media, which could cause the price of our Common Stock to decline further.

As a consequence, our inability to maintain our listing on NASDAQ could also adversely affect our ability to obtain financing for the continuation of our operations and could result in a loss of confidence by investors, suppliers and employees. In addition, our stockholders' ability to trade or obtain quotations on our shares could be severely limited because of lower trading volumes and transaction delays. These factors could contribute to lower prices and larger spreads in the bid and ask price for our Common Stock.

We have debt on our balance sheet, which could have consequences if we were unable to repay the principal or interest due.

Unidym. We have debt on our consolidated balance sheet, including a capital lease obligation acquired in connection with Unidym's acquisition of Nanoconduction, Inc. As of July 31, 2009, the capital lease obligation requires us to pay a total of \$796,000 in 11 monthly payments of \$75,000 each for capital equipment at Unidym's Sunnyvale, California location and the equipment itself serves as collateral for the debt. Unidym's ability to make payments on its indebtedness will depend on its ability to conserve the cash that it has on hand and to generate cash in the future. Neither Unidym nor the Company currently generates significant revenue. Because Unidym does not currently have a substantial amount of cash on hand, Unidym might be required to divert cash from development activities or to generate cash via debt or equity financing to be able to meet the monthly payment requirements under the capital lease obligation. This situation, to some extent, is subject to general economic, financial, competitive, legislative, regulatory and other factors that are beyond our control. Also, given the current economic climate, financing options might be limited going forward, which could prevent Unidym from obtaining the necessary funds to pay its indebtedness when due. Because the equipment serves as collateral for the debt, if Unidym is unable to make the monthly payments when due, the lessor of the equipment, at its discretion, may seize the equipment and Unidym would not be able to use the equipment in its development activities.

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Calando. Calando has a \$500,000 unsecured convertible promissory note outstanding. The note bears 10% interest accrued annually and has a two-year maturity. The note is also payable at two times face value in certain events, including, among other things, the license of Calando's siRNA delivery system. Following maturity, the note becomes payable on demand. If Calando is unable to meet its obligations to the bearer of the note after maturity, we may also not be in a position to lend Calando sufficient cash to pay such demand note. Unless other sources of financing become available, the failure to meet this obligation could result in Calando's insolvency.

The costs to fund the operations of our subsidiaries are difficult to predict, and our anticipated expenditures in support of our subsidiaries may increase or decrease for a variety of reasons.

Development, manufacturing and sale of cost-effective electronic products incorporating carbon nanotubes may require significant additional investment and take a long time. It is possible that the development and scale up of Unidym's carbon nanotube manufacturing effort and its development and scale up of its transparent conductive film products could be delayed for a number of reasons, including unforeseen difficulties with the technology development and delays in adoption of the technology by customers. Any delay would result in additional unforeseen costs, which would harm our results of operations. Due to these uncertainties, we cannot reasonably estimate the size, nature or timing of the costs to complete the development of Unidym's products or net cash inflows from Unidym's current activities.

Our subsidiaries have entered into technology license agreements with third parties that require us to satisfy obligations to keep them effective, and if these agreements are terminated, our technology and our business would be seriously and adversely affected.

Through our subsidiaries, we have entered into exclusive, long-term license agreements with Rice University, California Institute of Technology, Alnylam Pharmaceuticals, Inc. and other entities to incorporate their proprietary technologies into our proposed products. These license agreements require us to pay royalties and satisfy other conditions, including conditions related to the commercialization of the licensed technology. We cannot give any assurance that we will successfully incorporate these technologies into marketable products or, if we do, whether sales will be sufficient to recover the amounts that we are obligated to pay to the licensors. Failure by us to satisfy our obligations under these agreements may result in the modification of the terms of the licenses, such as by rendering them non-exclusive, or may give our licensors the right to terminate their respective agreement with us, which would limit our ability to implement our current business plan and harm our business and financial condition.

Risks Related to Our Business Model and Company

We are a development stage company and our success is subject to the substantial risks inherent in the establishment of a new business venture.

The implementation of our business strategy is still in the development stage. We currently own majority interests in four subsidiary companies, investments in two early stage biotech companies and, through Unidym, one university research project at Duke University. Our business and operations should be considered to be in the development stage and subject to all of the risks inherent in the establishment of a new business venture. Accordingly, our intended business and operations may not prove to be successful in the near future, if at all. Any future success that we might enjoy will depend upon many factors, several of which may be beyond our control, or which cannot be predicted at this time, and which could have a material adverse effect upon our financial condition, business prospects and operations and the value of an investment in the company.

Calando may be unable to find additional partners to license its technologies.

As part of our cash conservation strategy that scales back our financial support for Calando at this time, Calando has embarked on a phase down of its operations and has shifted its focus to licensing its technologies to partners. Currently, Calando has one licensing partner, but there can be no assurance that Calando will be able to find additional partners to license its technologies upon terms favorable to Calando.

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If Calando licenses its technologies, it will lose a considerable amount of control over its intellectual property and may not receive adequate licensing revenues in exchange.

The business model of our subsidiaries has historically been to develop new nanotechnologies and to exploit the intellectual property created through the research and development process to develop commercially successful products. Calando has licensed a portion of its technology to Cerulean Pharma, Inc. and intends to pursue further licensing arrangements with other companies. As Calando licenses its technology to other companies, it will lose control over certain of the technologies it licenses and will be unable to significantly direct the commercialization of its technologies. In addition, Calando's licensees may not be successful in the further commercialization of Calando's technologies and anticipated revenues from such license agreements may be less than expected or may not be paid at all.

There are substantial inherent risks in attempting to commercialize new technological applications, and, as a result, we may not be able to successfully develop nanotechnology for commercial use.

The Company finances research and development of nanotechnology, which is a new and unproven field. Our scientists and engineers are working on developing technology in various stages. However, such technology's commercial feasibility and acceptance is unknown. Scientific research and development requires significant amounts of capital and takes an extremely long time to reach commercial viability, if at all. To date, our research and development projects have not produced commercially viable applications, and may never do so. During the research and development process, we may experience technological barriers that we may be unable to overcome. For example, our scientists must determine how to design and develop nanotechnology applications for potential products designed by third parties for use in cost-effective manufacturing processes. Because of these uncertainties, it is possible that none of our potential applications will be successfully developed. If we are unable to successfully develop nanotechnology applications for commercial use, we will be unable to generate revenue or build a sustainable or profitable business.

Because we have not generated significant revenues to cover our operating expenses, we are dependent on raising additional capital from investors or lenders.

To date, we have only generated a small amount of revenue as a result of our current plan of operations. Given our strategy of financing new and unproven technology research, there is no assurance we would ever generate significant revenues. Our revenue-producing opportunities depend on liquidity events within our subsidiaries, such as a sale of the subsidiary, licensing transaction or initial public offering. We cannot be certain that we will be able to create a liquidity event for any of our subsidiaries and, even if we are able to, we cannot be certain of the timing or the potential proceeds to Arrowhead as a stockholder. Accordingly, our revenue prospects are uncertain and we must plan to finance our operations through the sales of equity securities or debt financing. If we are unable to continue raising operating capital from these sources, we may be forced to curtail or cease our operations.

We will need to achieve commercial acceptance of our applications to generate revenues and achieve profitability.

Even if our research and development yields technologically feasible applications, we may not successfully develop commercial products, and even if we do, we may not do so on a timely basis. If our research efforts are successful on the technology side, it could take at least several years before this technology will be commercially viable. During this period, superior competitive technologies may be introduced or customer needs may change, which will diminish or extinguish the commercial uses for our applications. Because nanotechnology is an emerging field, the degree to which potential consumers will adopt nanotechnology-enabled products is uncertain. We cannot predict when significant commercial market acceptance for nanotechnology-enabled products will develop, if at all, and we cannot reliably estimate the projected size of any such potential market. If markets fail to accept nanotechnology-enabled products, we may not be able to generate revenues from the commercial application of our technologies. Our revenue growth and achievement of profitability will depend substantially on our ability to introduce new technological applications to manufacturers for products accepted by customers. If we are unable to cost-effectively achieve acceptance of our technology among original equipment manufacturers and customers, or if the associated products do not achieve wide market acceptance, our business will be materially and adversely affected.

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We will need to establish additional relationships with strategic and development partners to fully develop and market our products.

We do not possess all of the resources necessary to develop and commercialize products that may result from our technologies on a mass scale. Unless we expand our product development capacity and enhance our internal marketing, we will need to make appropriate arrangements with strategic partners to develop and commercialize current and future products. If we do not find appropriate partners, or if our existing arrangements or future agreements are not successful, our ability to develop and commercialize products could be adversely affected. Even if we are able to find collaborative partners, the overall success of the development and commercialization of product candidates in those programs will depend largely on the efforts of other parties and is beyond our control. In addition, in the event we pursue our commercialization strategy through collaboration, there are a variety of attendant technical, business and legal risks, including:

a development partner would likely gain access to our proprietary information, potentially enabling the partner to develop products without us or design around our intellectual property;

we may not be able to control the amount and timing of resources that our collaborators may be willing or able to devote to the development or commercialization of our product candidates or to their marketing and distribution; and

disputes may arise between us and our collaborators that result in the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts our management's resources. The occurrence of any of the above risks could impair our ability to generate revenues and harm our business and financial condition.

We need to retain a controlling interest, by ownership, contract or otherwise, in Unidym and Calando in order to avoid potentially being deemed an investment company under the Investment Company Act of 1940.

Companies that have more than 100 U.S. stockholders or are publicly traded in the U.S. or are, or hold themselves out as being, engaged primarily in the business of investing, reinvesting or trading in securities are subject to regulation under the Investment Company Act of 1940. Unless a substantial part of our assets consists of, and a substantial part of our income is derived from, interests in majority-owned subsidiaries and companies that we primarily control, whether by contract or otherwise, we may be required to register and become subject to regulation under the Investment Company Act. Because Investment Company Act regulation is, for the most part, inconsistent with our strategy of actively managing and operating our portfolio companies, a requirement to operate our business as a registered investment company would restrict our operations and require additional resources for compliance.

If we are deemed to be, and are required to register as, an investment company, we will be forced to comply with substantive requirements under the Investment Company Act, including:

limitations on our ability to borrow;

limitations on our capital structure;

restrictions on acquisitions of interests in associated companies;

prohibitions on transactions with our affiliates;

restrictions on specific investments; and

compliance with reporting, record keeping, voting, proxy disclosure and other rules and regulations.

In order to avoid regulation under the Investment Company Act, we may choose to make additional pro rata investments in Unidym and Calando to maintain a controlling interest.

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Nanotechnology-enabled products are new and may be viewed as being harmful to human health or the environment.

There is public concern regarding the human health, environmental and ethical implications of nanotechnology that could impede market acceptance of products developed through these means. Nanotechnology-enabled products could be composed of materials such as carbon, silicon, silicon carbide, germanium, gallium arsenide, gallium nitride, cadmium selenide or indium phosphide, which may prove to be unsafe or harmful to human health or to the environment because of the size, shape or composition of the nanostructures. For this reason, these nanostructures may prove to present risks to human health or the environment that are different from and greater than the better understood risks that may be presented by the constituent materials in non-nanoscale forms. Because of the potential, but at this point unknown, risks associated with certain nanomaterials, government authorities in the U.S. or individual states, and foreign government authorities could, for social or other purposes, prohibit or regulate the use of some or all nanotechnologies. The U.S. Environmental Protection Agency has in that regard recently taken steps towards regulation of the manufacture and use of certain nanotechnology-enabled materials, including those containing carbon nanotubes or nanosilver. Further, the U.S. National Academy of Sciences/National Research Council concluded that the U.S. government needs to develop a more robust and coordinated plan for addressing the potential environmental, health, and safety risks of nanomaterials. The regulation and limitation of the kinds of materials used in or used to develop nanotechnology-enabled products, or the regulation of the products themselves, could halt or delay the commercialization of nanotechnology-enabled products or substantially increase the cost, which will impair our ability to achieve revenue from the license of nanotechnology applications.

We may not be able to effectively secure first-tier research and development projects when competing against other ventures.

We compete with a substantial number of other companies that fund early-stage, scientific research at universities to secure rights to promising technologies. In addition, many venture capital firms and other institutional investors invest in companies seeking to commercialize various types of emerging technologies. Many of these companies have greater resources than we do. Therefore, we may not be able to secure the opportunity to finance first-tier research and commercialization projects. Furthermore, should any commercial undertaking by us prove to be successful, there can be no assurance competitors with greater financial resources will not offer competitive products and/or technologies.

We rely on outside sources for various components and processes for our products.

We rely on third parties for various components and processes for our products. While we try to have at least two sources for each component and process, we may not be able to achieve multiple sourcing because there may be no acceptable second source, other companies may choose not to work with us, or the component or process sought may be so new that a second source does not exist, or does not exist on acceptable terms. In addition, due to the recent tightening of global credit and the disruption in the financial markets, there may be a disruption or delay in the performance of our third-party contractors, suppliers or collaborators. If such third parties are unable to satisfy their commitments to us, our business would be adversely affected. Therefore, it is possible that our business plans will have to be slowed down or stopped completely at times due to our inability to obtain required raw materials, components and outsourced processes at an acceptable cost, if at all, or to get a timely response from vendors.

We must overcome the many obstacles associated with integrating and operating varying business ventures to succeed.

Our model to integrate and oversee the strategic direction of various subsidiaries and research and development projects presents many risks, including:

the difficulty of integrating operations and personnel; and

the diversion of our management's attention as a result of evaluating, negotiating and integrating acquisitions or new business ventures.

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If we are unable to timely and efficiently design and integrate administrative and operational support for our subsidiaries, we may be unable to manage projects effectively, which could adversely affect our ability to meet our business objectives and the value of an investment in the Company could decline.

In addition, consummating acquisitions and taking advantage of strategic relationships could adversely impact our cash position, and dilute stockholder interests, for many reasons, including:

changes to our income to reflect the amortization of acquired intangible assets, including goodwill;

interest costs and debt service requirements for any debt incurred to fund our growth strategy; and

any issuance of securities to fund our operations or growth, which dilutes or lessens the rights of current stockholders.

Our success depends on the attraction and retention of senior management and scientists with relevant expertise.

Our future success will depend to a significant extent on the continued services of our key employees. In addition, we rely on several key executives to manage each of our subsidiaries. We do not maintain key man life insurance for any of our executives. Our ability to execute our strategy also will depend on our ability to continue to attract and retain qualified scientists, sales, marketing and additional managerial personnel. If we are unable to find, hire and retain qualified individuals, we could have difficulty implementing our business plan in a timely manner, or at all. Given the Company's current financial constraints, we may need to terminate additional employees, including senior management and technical employees, or such employees may seek other employment. With these and past reductions, it is possible that valuable know-how will be lost and that development efforts could be negatively affected.

Members of our senior management team and Board may have a conflict of interest in also serving as officers and/or directors of our subsidiaries.

While we expect that our officers and directors who also serve as officers and/or directors of our subsidiaries will comply with their fiduciary duties owed to our stockholders, they may have conflicting fiduciary obligations to our stockholders and the minority stockholders of our subsidiaries. Specifically, Dr. Anzalone, our CEO and President, is the founder, CEO and a board member of Nanotope, Inc. (Nanotope), a regenerative medicine company that is separately financed in which the Company owns a 22% interest, and Leonardo Biosystems, Inc. (LBS), a drug delivery company that is separately financed in which the Company owns a 6% interest. Dr. Anzalone owns a minority interest in the stock of Nanotope and LBS. To the extent that any of our directors choose to recuse themselves from particular Board actions to avoid a conflict of interest, the other members of our Board of Directors will have a greater influence on such decisions.

Our efforts pertaining to the pharmaceutical industry are subject to additional risks.

Our subsidiaries, Calando and Tego Biosciences Corporation, as well as minority investments Nanotope and LBS, are focused on technology related to new and improved pharmaceutical candidates. Drug development is time consuming, expensive and risky. Even product candidates that appear promising in the early phases of development, such as in early animal and human clinical trials, often fail to reach the market for a number of reasons, such as:

clinical trial results are not acceptable, even though preclinical trial results were promising;

inefficacy and/or harmful side effects in humans or animals;

the necessary regulatory bodies, such as the U.S. Food and Drug Administration, did not approve our potential product for the intended use; and

manufacturing and distribution is uneconomical.

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Clinical trial results are frequently susceptible to varying interpretations by scientists, medical personnel, regulatory personnel, statisticians and others, which often delays, limits, or prevents further clinical development or regulatory approvals of potential products. If the subsidiaries technology is not cost effective or if the associated drug products do not achieve wide market acceptance, the value of a subsidiary would be materially and adversely affected.

Any drugs developed by our subsidiaries may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, thereby harming our business.

Increasing expenditures for healthcare have been the subject of considerable public attention in the U.S. Both private and government entities are seeking ways to reduce or contain healthcare costs. Numerous proposals that would affect changes in the U.S. healthcare system have been introduced or proposed in Congress and in some state legislatures, including reductions in the cost of prescription products and changes in the levels at which consumers and healthcare providers are reimbursed for purchases of pharmaceutical products.

The ability of Calando, Tego and our minority investments Nanotope and LBS to market products successfully (either on their own or in partnership with other companies) will depend in part on the extent to which third-party payers are willing to reimburse patients for the costs of their products and related treatments. These third-party payers include government authorities, private health insurers and other organizations, such as health maintenance organizations. Third party payers are increasingly challenging the prices charged for medical products and services. In addition, the trend toward managed healthcare and government insurance programs could result in lower prices and reduced demand for the products of these companies. Cost containment measures instituted by healthcare providers and any general healthcare reform could affect their ability to sell products and may have a material adverse effect on them, thereby diminishing the value of the Company's interest in these subsidiaries or any anticipated milestone or royalty payments. We cannot predict the effect of future legislation or regulation concerning the healthcare industry and third party coverage and reimbursement on our business.

There may be a difference in the investment valuations that we used when making initial and subsequent investments in our subsidiaries and minority investments and actual market values.

Our investments in our subsidiaries and minority interests were the result of negotiation with subsidiary management and equity holders, and the investment valuations were not independently verified. Traditional methods used by independent valuation analysts include a discounted cash flow analysis and a comparable company analysis. We have not generated a positive cash flow to date and do not expect to generate significant cash flow in the near future. Additionally, we believe that there exist comparable public companies to provide a meaningful valuation comparison. Accordingly, we have not sought independent valuation analysis in connection with our investments and may have invested in our various holdings at higher or lower valuations than an independent source would have recommended. There may be no correlation between the investment valuations that we used over the years for our investments and the actual market values. If we should eventually sell all or a part of any of our consolidated business or that of a subsidiary, the ultimate sale price may be for a value substantially lower or higher than previously determined by us, which could materially and adversely impair the value of our Common Stock.

Risks Related to Our Intellectual Property

If Unidym is unable to raise additional cash or pay its debts, Unidym may lose rights to critical intellectual property.

Unidym is required to meet certain financial covenants pursuant to the Rice University license agreement Unidym acquired upon its acquisition of CNI. When Unidym acquired CNI, CNI possessed intellectual property rights concerning carbon nanotubes that it had licensed from Rice University. The Rice license includes financial covenants tested quarterly for compliance. If Unidym fails to meet the financial covenants, the Rice license automatically terminates. If this should happen, the value of Unidym's intellectual property portfolio would be significantly and adversely affected and Unidym would likely lose patent protection for its products and licensing opportunities for the majority of its CNT intellectual portfolio.

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Our ability to protect our patents and other proprietary rights is uncertain, exposing us to the possible loss of competitive advantage.

Our subsidiaries have licensed rights to pending patents and have filed and will continue to file patent applications. The researchers sponsored by us may also file patent applications that we choose to license. If a particular patent is not granted, the value of the invention described in the patent would be diminished. Further, even if these patents are granted, they may be difficult to enforce. Even if successful, efforts to enforce our patent rights could be expensive, distracting for management, cause our patents to be invalidated, and frustrate commercialization of products. Additionally, even if patents are issued and are enforceable, others may independently develop similar, superior or parallel technologies to any technology developed by us, or our technology may prove to infringe upon patents or rights owned by others. Thus, the patents held by or licensed to us may not afford us any meaningful competitive advantage. If we are unable to derive value from our licensed or owned intellectual property, the value of your investment may decline.

Our ability to develop and commercialize products will depend on our ability to enforce our intellectual property rights and operate without infringing the proprietary rights of third parties.

Our ability and the ability of our subsidiaries to develop and commercialize products based on their respective patent portfolios, will depend, in part, on our ability and the ability of our subsidiaries to enforce those patents and operate without infringing the proprietary rights of third parties. There can be no assurance that any patents that may issue from patent applications owned or licensed by us or any of our subsidiaries will provide sufficient protection to conduct our respective businesses as presently conducted or as proposed to be conducted, or that we or our subsidiaries will remain free from infringement claims by third parties.

We may be subject to patent infringement claims, which could result in substantial costs and liability and prevent us from commercializing our potential products.

Because the nanotechnology intellectual property landscape is rapidly evolving and interdisciplinary, it is difficult to conclusively assess our freedom to operate without infringing on third party rights. However, we are currently aware of certain patent rights held by third parties that, if found to be valid and enforceable, could be alleged to render one or more of our business lines infringing. If a claim should be brought and is successful, we may be required to pay substantial damages, be forced to abandon any affected business lines and/or seek a license from the patent holder. In addition, any patent infringement claims brought against us or our subsidiaries, whether or not successful, may cause us to incur significant expenses and divert the attention of our management and key personnel from other business concerns. These could negatively affect our results of operations and prospects. There can also be no assurance that patents owned or licensed by us or our subsidiaries will not be challenged by others.

In addition, if our potential products infringe the intellectual property rights of third parties, these third parties may assert infringement claims against our customers, and we may be required to indemnify our customers for any damages they suffer as a result of these claims. The claims may require us to initiate or defend protracted and costly litigation on behalf of customers, regardless of the merits of these claims. If any of these claims succeed, we may be forced to pay damages on behalf of our customers or may be required to obtain licenses for the products they use. If we cannot obtain all necessary licenses on commercially reasonable terms, we may be unable to continue selling such products.

The technology licensed by our subsidiaries from various third parties may be subject to government rights and retained rights of the originating research institutions.

We license technology from Caltech, Rice University, and other universities and companies. Our licensors may have obligations to government agencies or universities. Under their agreements, a government agency or university may obtain certain rights over the technology that we have developed and licensed, including the right to require that a compulsory license be granted to one or more third parties selected by the government agency.

In addition, our collaborators often retain certain rights under their agreements with us, including the right to use the underlying technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether our collaborators limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights to our licensed technology in the event of misuse.

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Risks Related to Regulation of Our Products

Our corporate compliance program cannot guarantee that we are in compliance with all applicable federal and state regulations.

Our operations, including our research and development and our commercialization efforts, such as clinical trials, manufacturing and distribution, are subject to extensive federal and state regulation. While we have developed and instituted a corporate compliance program, we cannot assure you that the Company or our employees are or will be in compliance with all potentially applicable federal and state regulations or laws. If we fail to comply with any of these regulations or laws, a range of actions could result, including, but not limited to, the termination of clinical trials, the failure to approve a commercialized product, significant fines, sanctions, or litigation, any of which could harm our business and financial condition.

If export controls affecting our products are expanded, our business will be adversely affected.

The federal government regulates the sale and shipment of numerous technologies by U.S. companies to foreign countries. Our subsidiaries may develop products that might be useful for military and antiterrorism activities. Accordingly, federal government export regulations could restrict sales of these products in other countries. If the federal government places burdensome export controls on our technology or products, our business would be materially and adversely affected. If the federal government determines that we have not complied with the applicable export regulations, we may face penalties in the form of fines or other punishment.

Risks Related to our Stock

Stockholder equity interest may be substantially diluted in any additional financing.

Our certificate of incorporation authorizes the issuance of 70,000,000 shares of Common Stock and 5,000,000 shares of preferred stock, on such terms and at such prices as our Board of Directors may determine. As of August 12, 2009, 55,400,230 shares of Common Stock and no shares of preferred stock were issued and outstanding. As of August 12, 2009, 1,529,000 shares and 1,354,588 shares were reserved for issuance upon exercise of options granted under our 2000 Stock Option Plan (the 2000 Plan), and 2004 Equity Incentive Plan (the 2004 Plan), respectively, taking into consideration the decrease in the reserve for the 2004 Plan approved by the Board of Directors in order to make available sufficient stock for issuance in the Private Placement. As of August 12, 2009, we had warrants outstanding to purchase 15,170,495 shares of Common Stock callable by us under certain market conditions, including warrants to purchase 9,196,642 shares of Common Stock issued in the Private Placement that are not included in this offering. We will need to seek stockholder approval to increase the authorized shares of Common Stock under our certificate of incorporation. If we do not receive stockholder approval, we may not be able to raise additional capital. Any increase in authorized shares of Common Stock approved by our stockholders, together with the issuance of additional securities in financing transactions by us or through the exercise of options or warrants would dilute the equity interests of our existing stockholders, perhaps substantially, and might result in dilution in the tangible net book value of a share of our Common Stock, depending upon the price and other terms on which the additional shares are issued.

Our Common Stock price has fluctuated significantly over the last several years and may continue to do so in the future, without regard to our results of operations and prospects.

Because we are a development stage company, there are few objective metrics by which our progress may be measured. Consequently, we expect that the market price of our Common Stock will likely continue to fluctuate significantly. We do not expect to generate substantial revenue from the license or sale of our nanotechnology for several years, if at all. In the absence of product revenue as a measure of our operating performance, we anticipate that investors and market analysts will assess our performance by considering factors such as:

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announcements of developments related to our business;

developments in our strategic relationships with scientists within the nanotechnology field;

our ability to enter into or extend investigation phase, development phase, commercialization phase and other agreements with new and/or existing partners;

announcements regarding the status of any or all of our collaborations or products;

market perception and/or investor sentiment regarding nanotechnology as the next technological wave;

announcements regarding developments in the nanotechnology field in general;

the issuance of competitive patents or disallowance or loss of our patent rights; and

quarterly variations in our operating results.

We will not have control over many of these factors but expect that they may influence our stock price. As a result, our stock price may be volatile and any extreme fluctuations in the market price of our Common Stock could result in the loss of all or part of your investment.

The market for purchases and sales of our Common Stock may be very limited, and the sale of a limited number of shares could cause the price to fall sharply.

Although our Common Stock is listed for trading on the NASDAQ Capital Market, our securities are currently relatively thinly traded. Our current solvency concerns could serve to exacerbate the thin trading of our securities. For example, mandatory sales of our Common Stock by institutional holders could be triggered if an investment in our Common Stock no longer satisfies their investment standards and guidelines as a result of the solvency concerns. Accordingly, it may be difficult to sell shares of Common Stock quickly without significantly depressing the value of the stock. Unless we are successful in developing continued investor interest in our stock, sales of our stock could continue to result in major fluctuations in the price of the stock. Moreover, our stock price has generally been declining for the last 24 months.

If securities or industry analysts do not publish research reports about our business or if they make adverse recommendations regarding an investment in our stock, our stock price and trading volume may decline.

The trading market for our Common Stock will be influenced by the research and reports that industry or securities analysts publish about our business. We do not currently have and may never obtain research coverage by industry or securities analysts. Investors have many investment opportunities and may limit their investments to companies that receive coverage from analysts. If no industry or securities analysts commence coverage of the Company, the trading price of our stock could be negatively impacted. In the event we obtain industry or security analyst coverage, if one or more of the analysts downgrade our stock or comment negatively on our prospects, our stock price would likely decline. If one or more of these analysts cease to cover our industry or us or fails to publish reports about the Company regularly, our Common Stock could lose visibility in the financial markets, which could also cause our stock price or trading volume to decline.

The market price of our Common Stock may be adversely affected by the sale of shares by our management or founding stockholders.

Sales of our Common Stock by our officers, directors and founding stockholders could adversely and unpredictably affect the price of those securities. Additionally, the price of our Common Stock could be affected even by the potential for sales by these persons. We cannot predict the effect that any future sales of our Common Stock, or the potential for those sales, will have on our share price. Furthermore, due to relatively low trading volume of our stock, should one or more large stockholders seek to sell a significant portion of its stock in a short period of time, the price of our stock may decline.

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We may be the target of securities class action litigation due to future stock price volatility.

In the past, when the market price of a stock has been volatile, holders of that stock have often initiated securities class action litigation against the company that issued the stock. If any of our stockholders brought a lawsuit against us, we could incur substantial costs defending the lawsuit. The lawsuit could also divert the time and attention of our management.

We do not intend to declare cash dividends on our Common Stock.

We will not distribute cash to our stockholders unless and until we can develop sufficient funds from operations to meet our ongoing needs and implement our business plan. The time frame for that is inherently unpredictable, and you should not plan on it occurring in the near future, if at all.

Our Board of Directors has the authority to issue shares of blank check preferred stock, which may make an acquisition of the Company by another company more difficult.

We have adopted and may in the future adopt certain measures that may have the effect of delaying, deferring or preventing a takeover or other change in control of the Company that a holder of our Common Stock might consider in its best interest. Specifically, our Board of Directors, without further action by our stockholders, currently has the authority to issue up to 5,000,000 shares of preferred stock and to fix the rights (including voting rights), preferences and privileges of these shares (blank check preferred). Such preferred stock may have rights, including economic rights, senior to our Common Stock. Additionally, because we are effectively out of authorized unissued common stock, we may be forced to issue preferred stock in future capital raising transactions. As a result, the issuance of the preferred stock could have a material adverse effect on the price of our Common Stock and could make it more difficult for a third party to acquire a majority of our outstanding Common Stock.

USE OF PROCEEDS

The proceeds from the resale of the Shares under this prospectus are solely for the account of the Selling Stockholders. We may indirectly receive proceeds of up to \$4,598,321 to the extent that any Selling Stockholders exercise warrants to purchase Shares and then resell those Shares under this prospectus, however, we will not directly receive any proceeds from the sale of Shares under this prospectus.

SELLING SECURITY HOLDERS

The Company has included in this prospectus 9,196,642 shares of Common Stock issued upon the closing of the Private Placement

In July and August 2009, we sold to certain institutional and accredited investors an aggregate of 9,196,642 units, with each unit consisting of one Share of Common Stock at a per share purchase price of \$0.30, and a warrant to purchase an additional Share of Common Stock, exercisable at \$0.50 per share, in the Private Placement.

In connection with the Private Placement, we entered into a registration rights agreement, pursuant to which we have agreed to register the resale of the Shares and the Common Stock underlying the Warrants. This prospectus only covers the resale of the Shares.

The following table sets forth certain information regarding the Selling Stockholders and the shares of Common Stock beneficially owned by them, which information is available to us as of August 12, 2009. 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

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under this prospectus. However, for the purposes of the table below, we have assumed that, after completion of the offering, none of the Shares covered by this prospectus will be held by the Selling Stockholders. 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. 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 17.

| Selling Stockholder (1) | # of Shares held before Offering | # of Shares Offered | # of Shares beneficially owned after Offering(2) | % of Shares beneficially owned After Offering |
|--|---|----------------------------|---|--|
| F. Berdon & Co., L.P. | 133,333(3) | 83,333 | 50,000 | * |
| Lauren Carajohn | 300,000(4) | 200,000 | 100,000 | * |
| Cranshire Capital, L.P. (5) | 333,333 | 333,333 | | |
| M. Robert Ching | 4,053,585(6) | 3,610,340(7) | 443,245 | * |
| Brian T. Ching | 333,330 | 333,330 | | * |
| Estate of Brent D. Ching (8) | 263,333 | 250,000 | 13,333 | * |
| Bradley T. Ching | 333,330 | 333,330 | | |
| Judith Damashek | 266,667(9) | 166,667 | 100,000 | * |
| Robert Drust | 250,000 | 250,000(10) | | |
| Nick Giannopoulos | 293,333 | 293,333 | | |
| Gemini Master Fund, Ltd. (11) | 833,333 | 833,333 | | |
| Larry Hopfenspirger | 373,133(12) | 183,333 | 189,800 | * |
| Jason & Argo Partners Holding SA | 600,000(13) | 300,000 | 300,000 | * |
| Stephen A. & Margaret Johnson | 156,111 | 100,000 | 56,111 | * |
| David Lackey | 210,000(14) | 100,000 | 110,000 | * |
| Kevin McGrath | 133,333 | 133,333 | | |
| Roy R. Newman | 83,333 | 83,333 | | |
| The Pacific Coast Investment Trust | 333,333 | 333,333 | | |
| Arthur Rabin | 300,000 | 300,000 | | |
| Selma Rabin | 6,667 | 6,667 | | |
| Jeffrey D. Rahm | 217,000(15) | 179,500(16) | 37,500 | * |
| William Haile Riviere, Jr. & Renee Helen Riviere | 156,500(17) | 119,000 | 37,500 | * |

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| | | | | |
|--|------------|-----------|-----------|------|
| Rockmore Investment Master Fund Ltd. (18) | 166,667 | 166,667 | | |
| Russell Soloman | 87,810 | 87,810 | | |
| Ernest W. Southworth, Jr. | 166,667 | 166,667 | | |
| Pierre/Famille Inc. Profit Sharing Plan in the name of Donald N. Stone | 166,667 | 166,667 | | |
| John Williams | 83,333 | 83,333 | | |
| Total | 10,634,131 | 9,196,642 | 1,437,489 | 2.6% |

* Less than 1%.

- (1) If required, information about other selling security holders, except for any future transferees, pledgees, donees or successors of Selling Stockholders 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) This number (i) excludes warrants issued in the Private Placement which are not exercisable for six months and one day after their issuance and are therefore not included in the calculation of beneficial ownership, and (ii) assumes the sale of all shares being offered by this prospectus.
- (3) Includes 50,000 shares issuable upon exercise of a common stock purchase warrant.
- (4) Includes 100,000 shares issuable upon exercise of a common stock purchase warrant.
- (5) Downsview Capital, Inc. is the general partner of Cranshire Capital, L.P. (Cranshire) and consequently has voting control and investment discretion over securities held by Cranshire. Mitchell P. Kopin (Mr. Kopin), President of Downsview, has voting control over Downsview. As a result of the foregoing, each of Mr. Kopin and Downsview may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended) of the shares of Common Stock beneficially owned by Cranshire.
- (6) Includes 2,000 shares and 441,245 shares issuable upon exercise of a common stock purchase warrant.
- (7) Includes 1,064,002 Shares in the name of the Ching Revocable Trust and 360,000 Shares in the name of the M. Robert Ching, M.D. Inc. 401K Profit Sharing Plan.
- (8) M. Robert Ching is the executor of the Brent D. Ching Estate. As such, M. Robert Ching has voting and investment control over the Shares owned by the Brent D. Ching Estate. M. Robert Ching expressly disclaims beneficial ownership of such shares.
- (9) Includes 100,000 shares issuable upon exercise of a common stock purchase warrant.
- (10) Includes 166,667 Shares in the name of Guarantee & Trust Co. Tee fbo Robert Drust IRA.
- (11) The Investment Manager of Gemini Master Fund, Ltd. Is Gemini Strategies, LLC. The Managing Member of Gemini Strategies is Mr. Steven W. Winters. As such, Mr. Winters may be deemed beneficial owner of the shares, however Mr. Winters disclaims beneficial ownership of such shares.
- (12) Includes 120,800 shares of common stock and 69,400 shares issuable upon exercise of a common stock purchase warrant.
- (13) Includes 300,000 shares issuable upon exercise of a common stock purchase warrant.
- (14) Includes 10,000 shares of common stock and 100,000 shares issuable upon exercise of a common stock purchase warrant.
- (15) Includes 37,500 shares issuable upon exercise of a common stock purchase warrant.
- (16) Includes 67,000 Shares in the name of Stifel Nicolas Custodian for the Jeffrey Rahm IRA.
- (17) Includes 37,500 shares issuable upon exercise of a common stock purchase warrant.

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- (18) Rockmore Capital, LLC (Rockmore Capital) and Rockmore Partners, LLC (Rockmore Partners), each a limited liability company formed under the laws of the State of Delaware, serve as the investment manager and general partner, respectively, to Rockmore Investments (US) LP, a Delaware limited partnership, which invests all of its assets through Rockmore Investment Master Fund Ltd., an exempted company formed under the laws of Bermuda (Rockmore Master Fund). By reason of such relationships, Rockmore Capital and Rockmore Partners may be deemed to share dispositive power over the shares of our common stock owned by Rockmore Master Fund. Rockmore Capital and Rockmore Partners disclaim beneficial ownership of such shares of our common stock. Rockmore Partners has delegated authority to Rockmore Capital regarding the portfolio management decisions with respect to the shares of common stock owned by Rockmore Master Fund and, as of August 12, 2009, Mr. Bruce T. Bernstein and Mr. Brian Daly, as officers of Rockmore Capital, are responsible for the portfolio management decisions of the shares of common stock owned by Rockmore Master Fund. By reason of such authority, Messrs. Bernstein and Daly may be deemed to share dispositive power over the shares of our common stock owned by Rockmore Master Fund. Messrs. Bernstein and Daly disclaim beneficial ownership of such shares of our common stock and neither of such persons has any legal right to maintain such authority. No other person has sole or shared voting or dispositive power with respect to the shares of our common stock as those terms are used for purposes under Regulation 13D-G of the Securities Exchange Act of 1934, as amended. No person or group (as that term is used in Section 13(d) of the Securities Exchange Act of 1934, as amended, or the SEC's Regulation 13D-G) controls Rockmore Master Fund.

PLAN OF DISTRIBUTION

The Shares offered by this prospectus may be sold by the Selling Stockholders. 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

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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

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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, 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.

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 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.

We have agreed to indemnify the Selling Stockholders against liabilities, including liabilities under the Securities Act, the Exchange Act and state securities laws, relating to the registration of the Shares offered by this prospectus.

DESCRIPTION OF SECURITIES TO BE REGISTERED

Our authorized capital stock consists of 70,000,000 shares of Common Stock, \$0.001 par value per share, and 5,000,000 shares of preferred stock, \$0.001 par value per share.

Common Stock

Holders of Common Stock are entitled to receive ratably dividends out of funds legally available, if and when declared from time to time by our Board of Directors. The Company has never paid any cash dividends on its Common Stock and the Company's Board of Directors does not anticipate that it will pay cash dividends in the foreseeable future. The future payment of dividends, if any, on the Company's Common Stock is within the discretion of the Board of Directors and will depend upon earnings, capital requirements, financial condition and other relevant factors. Holders of Common Stock are entitled to one vote for each share held on each matter to be voted on by stockholders. There is no cumulative voting in the election of directors. In the event of liquidation, dissolution or winding up of the affairs of the Company, holders of Common Stock are to share in all assets remaining after the payment of liabilities and any preferential distributions payable to preferred stockholders, if any. The holders of Common Stock have no preemptive or conversion rights and are not subject to further calls or assessments.

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There are no redemption or sinking fund provisions applicable to the Common Stock. The rights of the holders of the Common Stock are subject to any rights that may be fixed for holders of preferred stock, if any. All of the outstanding shares of Common Stock are fully paid and non-assessable.

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Certificate of Incorporation

Under our Certificate of Incorporation, as amended, our Board of Directors, without further action by our stockholders, currently has the authority to issue up to 5,000,000 shares of preferred stock and to fix the rights (including voting rights), preferences and privileges of these blank check preferred shares. Such preferred stock may have rights, including economic rights, senior to our Common Stock. As a result, the issuance of the preferred stock could have a material adverse effect on the price of our Common Stock and could make it more difficult for a third party to acquire a majority of our outstanding Common Stock.

Delaware Anti-Takeover Law

We are subject to Section 203 of the General Corporation Law of the State of Delaware, or DGCL. Section 203 generally prohibits a public Delaware corporation from engaging in a business combination with an interested stockholder for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;

the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine whether shares held subject to the plan will be tendered in a tender or exchange offer; or

on or subsequent to the date of the transaction, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

Section 203 defines a business combination to include:

any merger or consolidation involving the corporation and the interested stockholder;

any sale, transfer, pledge or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;

subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; and

the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Transfer Agent and Registrar

We have appointed ComputerShare, Inc. as the Company's transfer agent and registrar.

Listing

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Our Common Stock is quoted on the NASDAQ Capital Market under the symbol ARWR .

LEGAL MATTERS

Certain legal matters relating to the validity of the Common Stock offered by this prospectus will be passed upon for us by Goodwin Procter LLP, San Francisco, California.

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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, 2008, have been so incorporated in reliance on the report dated December 15, 2008 of Rose, Snyder & Jacobs, a corporation of Certified Public Accountants, given on the authority of said firms as experts in auditing and accounting.

INFORMATION WITH RESPECT TO THE REGISTRANT

A substantial portion of the information required to be disclosed in the registration statement of which this prospectus is a part is incorporated by reference to our latest report on Form 10-K or definitive proxy statement on Schedule 14A. See "Incorporation of Certain Documents by Reference," "Prospectus Summary," and "Risk Factors." As of August 12, 2009, we had approximately 400 holders of our Common Stock.

MATERIAL CHANGES

There have been no material changes since September 30, 2008 that have not been described in our Annual Report on Form 10-K, this prospectus, our Quarterly Reports on Form 10-Q as of December 31, 2008, March 31, 2009 and June 30, 2009 and our Current Reports on Form 8-K.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

The Company files annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document filed by the Company at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. The Company's filings with the SEC are also available to the public at the SEC's Internet web site at <http://www.sec.gov>. You may also read and copy this information at the National Association of Securities Dealers, Inc., 1735 K Street, N.W., Washington, D.C. 20006.

The Company has filed a registration statement, of which this prospectus is a part, covering the securities offered hereby. As allowed by Commission rules, this prospectus does not include all of the information contained in the registration statement and the included exhibits, financial statements and schedules. You are referred to the registration statement, the included exhibits, financial statements and schedules for further information. This prospectus is qualified in its entirety by such other information.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows the Company to incorporate by reference the information that is filed by the Company with the SEC, which means that the Company can disclose important information to you by referring you to those documents. The documents incorporated by reference are:

1. The Company's Annual Report on Form 10-K for the fiscal year ended September 30, 2008, filed with the SEC on December 15, 2008, as amended by Amendment No. 1 to Form 10-K, filed with the SEC on December 17, 2008;
2. The Company's Quarterly Reports on Form 10-Q for the quarter ended December 31, 2008, filed with the SEC on February 9, 2009, for the quarter ended March 31, 2009, filed with the SEC on May 15, 2009, and for the quarter ended June 30, 2009, filed with the SEC on August 10, 2009;
3. The Company's Current Reports on Form 8-K, filed with the SEC on October 20, 2008, October 27, 2008, October 30, 2008, November 10, 2008, November 19, 2008, November 28, 2008, December 3, 2008, January 23, 2009, February 18, 2009, February 27, 2009, March 9, 2009, March 18, 2009, April 3, 2009, May 27, 2009, June 29, 2009, July 9, 2009, July 17, 2009, July 21, 2009; August 5, 2009 and August 10, 2009 (only with respect to Item 3.01);
- 4.

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The Company's definitive Proxy Statement on Schedule 14A, filed with the SEC on January 28, 2009, as revised and filed with the SEC on February 18, 2009.

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The Company will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus is delivered, upon such person's written or oral request, a copy of any and all of the information incorporated by reference in this prospectus, other than exhibits to such documents, unless such exhibits are specifically incorporated by reference into the information that this prospectus incorporates. Requests should be directed to the Secretary at Arrowhead Research Corporation, 201 South Lake Avenue, Suite 703, Pasadena, California 91101; telephone: (626) 304-3400.

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UP TO 9,196,642 SHARES OF COMMON STOCK

ARROWHEAD RESEARCH CORPORATION

PROSPECTUS

September 15, 2009