September 2015

To my fellow shareholders,

As the nucleic acid therapeutics sector gains momentum with the continued successful advancement of numerous human clinical trials, I believe that Marina Biotech, Inc. is well equipped to take advantage of that momentum. With multiple companies advancing numerous different nucleic acid-based compounds in the clinic, and more importantly compounds that are successfully demonstrating safety in human Phase 1 testing, I believe our broad drug discovery platform has positioned us as the partner of choice in both the rare disease and oncology therapeutic areas. We hope to pursue those near term business development transactions that will advance our company, while continuing to validate our proprietary and novel nucleic acid chemistries and delivery technologies.

Our SMARTICLES® delivery technology is demonstrating safety, tolerability and activity delivering two clinical stage, "first-in-class" nucleic acid therapeutics: (1) a BCL2 targeted DNA inhibitor through licensee ProNAi Therapeutics, Inc. and (2) a microRNA 34 mimic through licensee Mirna Therapeutics, Inc. In addition, ProNAi's recent successful IPO, resulting in an initial market capitalization of over $900 million, further validates the SMARTICLES platform. And, as I prepare this letter, Mirna has announced the imminent pricing of its IPO, which I hope will be similarly successful. With over 100 patients already dosed with SMARTICLES, we believe SMARTICLES is emerging as a "best-in-class" nucleic acid delivery technology.

As for our novel chemistries, we recently announced that we had entered into a licensing agreement with Hongene Biotechnology to develop and supply CRN-based amidites to us, our partners and the research community. The availability of a ready supply of CRN-based oligonucleotides will give us the opportunity, with sufficient funding, to advance our preclinical programs in myotonic dystrophy and Duchenne muscular dystrophy ("DMD"). In addition, I believe the interest of potential partners in this chemistry will increase, to the extent that we are able to offer our drug discovery development capabilities to those seeking to pursue any number of rare disease efforts, such as spinal muscular atrophy, Friedrich's ataxia, hemophilia and cystic fibrosis, among others.

As for our own pipeline, with appropriate funding, we hope to advance: (1) the clinical program for our CEQ508 product candidate for the treatment of Familial Adenomatous Polyposis, which currently holds both Orphan Drug Designation and Fast Track Designation from the U.S. Food and Drug Administration and (2) our programs regarding myotonic dystrophy and DMD.

We continue to seek the capital and the relationships that will allow us to realize the value potential of our technology and our drug discovery and delivery capabilities. We are currently pursuing both non-dilutive means of obtaining capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining capital, primarily through the offering of our securities. I encourage you to read our Annual Report on Form 10-K for the fiscal year ended December 31, 2014 — including the risk factors contained therein — which accompanies this letter, as well as the other documents that we have subsequently filed with the U.S. Securities and Exchange Commission, for further information about our company and the risks relating to our common stock.

On behalf of our Board of Directors and our team, I would like to express my most sincere appreciation to all our shareholders for your unwavering confidence, support and patience. We will continue to work tirelessly to build shareholder value and look forward to sharing our successes with you!

Sincerely,

J. Michael French
President and Chief Executive Officer

MARINA BIOTECH, INC.
P.O. Box 1559
Bothell, Washington 98041

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
To Be Held Friday, October 16, 2015 at 10:00 A.M. (Pacific Time)

TO THE STOCKHOLDERS OF MARINA BIOTECH, INC.:

Notice is hereby given that the Annual Meeting of Stockholders (the "Annual Meeting") of Marina Biotech, Inc. will be held on Friday, October 16, 2015, at 10:00 A.M. Pacific Time, at 12220 El Camino Real, Suite 300, San Diego, California 92130 for the purposes of considering and acting on the following items:

1. To elect five (5) persons to our Board of Directors, each to hold office until the 2016 annual meeting of stockholders and until their respective successors shall have been duly elected or appointed and qualify;

2. To ratify the appointment of Wolf & Company, P.C. as our independent registered public accounting firm for the fiscal year ending December 31, 2015; and

3. To hold an advisory vote on executive compensation.

The enclosed Proxy Statement includes information relating to these proposals. Additional purposes of the Annual Meeting are to transact such other business as may properly come before the Annual Meeting or any adjournment or postponement thereof.

Only stockholders of record as of the close of business on September 22, 2015 are entitled to notice of and to vote at the Annual Meeting. The holders of at least a majority of our outstanding shares of common stock present in person or by proxy are required for a quorum. You may vote electronically through the Internet or by telephone. The instructions on your proxy card describe how to use these convenient services. Of course, if you prefer, you can vote by mail by completing your proxy card and returning it to us in the enclosed envelope.

By Order of the Board of Directors,

/s/ J. Michael French
J. Michael French
President & CEO

September 29, 2015
New York, NY

OUR BOARD OF DIRECTORS APPRECIATES AND ENCOURAGES YOUR PARTICIPATION IN OUR ANNUAL MEETING. WHETHER OR NOT YOU PLAN TO ATTEND THE ANNUAL MEETING, IT IS IMPORTANT THAT YOUR SHARES BE REPRESENTED. ACCORDINGLY, PLEASE AUTHORIZE A PROXY TO VOTE YOUR SHARES BY INTERNET, TELEPHONE OR MAIL. IF YOU ATTEND THE ANNUAL MEETING, YOU MAY WITHDRAW YOUR PROXY, IF YOU WISH, AND VOTE IN PERSON. YOUR PROXY IS REVOCABLE IN ACCORDANCE WITH THE PROCEDURES SET FORTH IN THIS PROXY STATEMENT.

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MARINA BIOTECH, INC.
P.O. Box 1559
Bothell, Washington 98041

PROXY STATEMENT FOR
ANNUAL MEETING OF STOCKHOLDERS
To be held Friday, October 16, 2015 at 10:00 A.M. (Pacific Time)

ANNUAL MEETING AND PROXY SOLICITATION INFORMATION

General

This Proxy Statement is furnished in connection with the solicitation of proxies by the board of directors (the "Board of Directors") of Marina Biotech, Inc., a Delaware corporation, for use at the Annual Meeting of Stockholders to be held on Friday, October 16, 2015, at 10:00 A.M. Pacific Time, at 12220 El Camino Real, Suite 300, San Diego, California 92130, and at any postponements or adjournments thereof (the "Annual Meeting"). This Proxy Statement, the Notice of Annual Meeting of Stockholders and the accompanying proxy card are being mailed to stockholders on or about September 29, 2015.

Important Notice Regarding the Internet Availability of Proxy Materials for the Annual Meeting of Stockholders to Be Held on October 16, 2015: The Proxy Statement and the Annual Report to Shareholders are available at *www.marinabio.com*. We encourage you to review all of the important information contained in the proxy materials contained herein or accessed via our website before voting.

Solicitation and Voting Procedures

Solicitation. The solicitation of proxies will be conducted by mail, and we will bear all attendant costs. These costs will include the expense of preparing and mailing proxy materials for the Annual Meeting and reimbursements paid to brokerage firms and others for their expenses incurred in forwarding solicitation materials regarding the Annual Meeting to beneficial owners of our common stock, par value $0.006 per share. We may conduct further solicitation personally, telephonically, electronically or by facsimile through our officers, directors and regular employees, none of whom would receive additional compensation for assisting with the solicitation. We do not intend, but reserve the right, to use the services of a third party solicitation firm to assist us in soliciting proxies.

Voting. Stockholders of record may authorize the proxies named in the enclosed proxy card to vote their shares of common stock in the following manner:

- by mail, by marking the enclosed proxy card, signing and dating it, and returning it in the postage-paid envelope provided;
- by telephone, by dialing the toll-free telephone number 1-800-690-6903 from within the United States or Canada and following the instructions. Stockholders voting by telephone need not return the proxy card; and
- through the Internet, by accessing the World Wide Website address *www.voteproxy.com*. Stockholders voting by the Internet need not return the proxy card.

Revocability of Proxies. Any proxy given pursuant to this solicitation may be revoked by the person giving it at any time before it is exercised in the same manner in which it was given, or by delivering to J. Michael French, Chief Executive Officer, Marina Biotech, Inc., P.O. Box 1559, Bothell, Washington 98041, a written notice of revocation or a properly executed proxy bearing a later date, or by attending the Annual Meeting and giving notice of your intention to vote in person.

Voting Procedure. The presence at the Annual Meeting of a majority of our outstanding shares of common stock, represented either in person or by proxy, will constitute a quorum for the transaction of business at the Annual Meeting. The close of business on September 22, 2015 has been fixed as the record date (the "Record Date") for determining the holders of shares of common stock entitled to notice of and

to vote at the Annual Meeting. Each share of common stock outstanding on the Record Date is entitled to one vote on all matters. As of the Record Date, there were 26,451,237 shares of common stock outstanding. Under Delaware law, stockholders will not have appraisal or similar rights in connection with any proposal set forth in this Proxy Statement.

Stockholder votes will be tabulated by the persons appointed by the Board of Directors to act as inspectors of election for the Annual Meeting. Shares represented by a properly executed and delivered proxy will be voted at the Annual Meeting and, when instructions have been given by the stockholder, will be voted in accordance with those instructions. If no instructions are given, the shares will be voted FOR Proposal Nos. 1, 2 and 3.

Abstentions and broker non-votes will each be counted as present for the purpose of determining whether a quorum is present at the Annual Meeting. Abstentions will have no effect on the outcome of the election of directors (Proposal No. 1), but will be counted as a vote AGAINST the ratification of Wolf & Company, P.C. as our independent registered public accounting firm (Proposal No. 2) and AGAINST the approval of the advisory vote to approve the compensation of our named executive officers (Proposal No. 3).

Broker non-votes will have no effect on the outcome of the election of directors (Proposal No. 1), the ratification of Wolf & Company, P.C. as our independent registered public accounting firm (Proposal No. 2) or the approval of the advisory vote to approve the compensation of our named executive officers (Proposal No. 3).

A broker non-vote occurs when a broker submits a proxy card with respect to shares of common stock held in a fiduciary capacity (typically referred to as being held in "street name"), but declines to vote on a particular matter because the broker has not received voting instructions from the beneficial owner. Under the rules of the New York Stock Exchange, a broker may have the discretion to vote such shares on routine matters, but not on non-routine matters. Routine matters include the ratification of independent registered public accounting firms, but do not include the election of directors, the adoption of employee benefit plans and advisory votes regarding executive compensation. Thus, brokers will generally have the discretion to vote the proxy for Proposal No. 2, but will not have discretion to cast a vote on Proposal Nos. 1 and 3.

On each matter properly presented for consideration at the Annual Meeting, stockholders will be entitled to one vote for each share of common stock held. Stockholders do not have cumulative voting rights in the election of directors.

Vote Required. For the election of directors (Proposal No. 1), the nominees who receive a plurality of votes from the shares present in person or by proxy and entitled to vote at the Annual Meeting will be elected. For the ratification of our independent registered public accounting firm (Proposal No. 2) and the approval of the advisory vote to approve the compensation of our named executive officers (Proposal No. 3), the vote of a majority of the shares present in person or by proxy and entitled to vote on the matter at the Annual Meeting is required. Because your vote with respect to Proposal No. 3 is advisory, it will not be binding upon our Board of Directors.

If any other matters are properly presented for consideration at the Annual Meeting, the persons named in the enclosed proxy will have discretion to vote on those matters in accordance with their best judgment.

Householding. Some banks, brokers and other nominee record holders may be participating in the practice of "householding" proxy statements and annual reports. This means that only one copy of this Proxy Statement or our annual report may have been sent to multiple shareholders in your household. We will promptly deliver a separate copy of either document to you if you call or write us at the following address or phone number: Marina Biotech, Inc., P.O. Box 1559, Bothell, Washington 98041, phone: (425) 892-4322, Attention: J. Michael French, President and Chief Executive Officer. If you want to receive separate copies of our annual report and Proxy Statement in the future, or if you are receiving multiple copies and would like to receive only one copy for your household, you should contact your bank, broker or other nominee record holder, or you may contact us at the above address and phone number.

PROPOSAL NO. 1

ELECTION OF DIRECTORS

General

Our Amended and Restated Bylaws (the "Bylaws") provide that the Board of Directors shall consist of not less than four (4) members and not more than eleven (11) members, as fixed by the Board of Directors. Currently, the Board of Directors consists of five (5) members.

At the Annual Meeting, five (5) directors are to be elected by the holders of the common stock to serve until the 2016 annual meeting of our stockholders and until such directors' respective successors are elected or appointed and qualify or until any such director's earlier resignation or removal. The Board of Directors has nominated each of the persons listed below for election to the Board of Directors at the Annual Meeting. Each of the director nominees is currently a member of our Board of Directors.

Name	Age	Position	Director Since
J. Michael French	55	Chief Executive Officer, President and Chairman of the Board of Directors	September 2008
Stefan Loren, Ph.D.	51	Lead Independent Director	August 2012
Joseph W. Ramelli	47	Director	August 2012
Philip C. Ranker	56	Director	January 2014
Donald A. Williams	57	Director	September 2014

In the event any nominee is unable or unwilling to serve as a director at the time of the Annual Meeting, the proxies may be voted for the balance of those nominees named and for any substitute nominee designated by the current Board of Directors or the proxy holders to fill such vacancy or for the balance of those nominees named without the nomination of a substitute, or the size of the Board of Directors may be reduced in accordance with our Bylaws.

Nominees

The following information is submitted concerning the nominees for election as directors based upon information received by us from such persons:

J. Michael French — Mr. French has served as our chief executive officer ("CEO") since June 23, 2008, as our president since October 1, 2008, and as a member of our board of directors since September 11, 2008. Mr. French was appointed chairman of our board of directors on August 21, 2012. Prior to joining us, Mr. French served as president of Rosetta Genomics, Inc. from May 2007 to August 2007. Mr. French also served as senior vice president of corporate development for Sirna Therapeutics, Inc. ("Sirna") from July 2005 to January 2007, when Sirna was acquired by Merck and Co., Inc., and he served in various executive positions, including chief business officer, senior vice president of business development and vice president of strategic alliances, of Entelos, Inc., a pre-IPO biotechnology company, from 2000 to 2005. Mr. French, holds a B.S. in aerospace engineering from the U.S. Military Academy at West Point and a M.S. in physiology and biophysics from Georgetown University.

Stefan C. Loren, Ph.D. — Dr. Loren has served as a director of our company since August 2012. Dr. Loren is currently the founder at Loren Capital Strategy LLC, a health care-focused fund management firm. He was previously managing director at Westwicke Partners, a healthcare-focused consulting firm, from 2008 through February 2014. Dr. Loren has over 20 years of experience as a research and investment professional in the healthcare space, including roles at Perceptive Advisors, MTB Investment Advisors, Legg Mason, and Abbott Laboratories. Prior to industry, Dr. Loren served as a researcher at The Scripps Research Institute working with Nobel Laureate K. Barry Sharpless on novel synthetic routes to chiral drugs. His scientific work has been featured in Scientific American, Time, Newsweek and Discover, as well as other periodicals and journals. Dr. Loren has served as a director of GenVec, Inc. since September 2013 and as a director of Cellectar Biosciences, Inc. since June 2015, and within the past five years, he has served on the board of directors of Orchid Cellmark Inc. and Polymedix, Inc. Dr. Loren received a doctorate degree in organic chemistry from the University of California at Berkeley and a bachelor's degree in chemistry from the University of California San Diego.

Joseph W. Ramelli — Mr. Ramelli has served as a director of our company since August 2012. Mr. Ramelli currently works as a consultant for several investment funds providing in-depth due diligence and investment recommendations. He has over 20 years of experience in the investment industry, having worked as both an institutional equity trader and as an equity analyst at Eos Funds, Robert W. Duggan & Associates and Seneca Capital Management. Mr. Ramelli graduated with honors from the University of California at Santa Barbara, with a B.A. in business economics.

Philip C. Ranker — Mr. Ranker has served as a director of our company since January 2014. Currently, Mr. Ranker serves as chief financial officer at Bioness, Inc. Previously he served as our chief accounting officer from September 7, 2011 until September 30, 2011, and then served as our interim chief financial officer and secretary from October 1, 2011 until December 31, 2013. Before that, Mr. Ranker served as chief financial officer of Suneva Medical, Inc. from 2009 to 2011, and as vice president of finance at Amylin Pharmaceuticals, Inc. from 2008 to 2009. Prior to Amylin, Mr. Ranker held various positions with Nastech Pharmaceutical Company Inc. (the predecessor to Marina Biotech) from 2004 to 2008, including vice president of finance from August 2004 until September 2005, and chief financial officer and secretary from September 2005 until January 2008. From September 2001 to August 2004, Mr. Ranker served as director of finance for ICOS Corporation. Prior to working at ICOS, Mr. Ranker served in various positions in corporate accounting, managed care contracting and research and development, including senior finance director, at Aventis Pharmaceutical and its predecessor companies during his nearly 15 years with the organization. From February 2006 until 2010, Mr. Ranker also served as a member of the board of directors and as the chair of the audit committee of ImaRx Therapeutics, Inc., which executed an initial public offering during his tenure. Prior to Aventis, Mr. Ranker was employed by Peat Marwick (currently KPMG) as a Certified Public Accountant. Mr. Ranker holds a B.S. in accounting from the University of Kansas.

Donald A. Williams — Mr. Williams has served as a director of our company since September 2014. Mr. Williams is a 35-year veteran of the public accounting industry, retiring in 2014. Mr. Williams spent 18 years as an Ernst & Young (EY) Partner and the last seven years as a partner with Grant Thornton (GT). Mr. Williams' career focused on private and public companies in the technology and life sciences sectors. During the last seven years at GT, he served as the national leader of Grant Thornton's life sciences practice and the managing partner of the San Diego Office. He was the lead partner for both EY and GT on multiple initial public offerings; secondary offerings; private and public debt financings; as well as numerous mergers and acquisitions. From 2001 to 2014, Mr. Williams served on the board of directors and is past president and chairman of the San Diego Venture Group and has served on the board of directors of various charitable organizations in the communities in which he has lived. Beginning in 2015, Mr. Williams has served as a director of Proove Biosciences, Inc. and of Alphatec Holdings, Inc. (and its wholly-owned operating subsidiary, Alphatec Spine, Inc.) Mr. Williams is a graduate of Southern Illinois University with a B.S. degree.

Vote Required and Board of Directors' Recommendation

Assuming a quorum is present, the affirmative vote of a plurality of the votes cast at the Annual Meeting, either in person or by proxy, is required for the election of a director. For purposes of the election of directors, abstentions and broker non-votes will have no effect on the result of the vote.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" ALL OF THE NOMINEES NAMED IN PROPOSAL NO. 1.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS

The following table sets forth certain information regarding the ownership of our common stock as of September 22, 2015 (the "Determination Date") by: (i) each current director of our company and each director nominee; (ii) each of our Named Executive Officers; (iii) all current executive officers and directors of our company as a group; and (iv) all those known by us to be beneficial owners of more than five percent (5%) of our common stock.

Beneficial ownership and percentage ownership are determined in accordance with the rules of the SEC. Under these rules, beneficial ownership generally includes any shares as to which the individual or entity has sole or shared voting power or investment power and includes any shares that an individual or entity has the right to acquire beneficial ownership of within 60 days of the Determination Date, through the exercise of any option, warrant or similar right (such instruments being deemed to be "presently exercisable"). In computing the number of shares beneficially owned by a person and the percentage ownership of that person, shares of our common stock that could be issued upon the exercise of presently exercisable options and warrants are considered to be outstanding. These shares, however, are not considered outstanding as of the Determination Date when computing the percentage ownership of each other person.

To our knowledge, except as indicated in the footnotes to the following table, and subject to state community property laws where applicable, all beneficial owners named in the following table have sole voting and investment power with respect to all shares shown as beneficially owned by them. Percentage of ownership is based on 26,451,237 shares of common stock outstanding as of the Determination Date. Unless otherwise indicated, the business address of each person in the table below is c/o Marina Biotech, Inc., P.O. Box 1559, Bothell, WA 98041. No shares identified below are subject to a pledge.

Name	Number of Shares	Percent of Shares Outstanding (%)
Officers and Directors:		
J. Michael French, Director, President and CEO	1,122,116[(1)]	4.2%
Stefan Loren, Ph.D., Director	266,335[(2)]	1.0%
Joseph W. Ramelli, Director	288,603[(3)]	1.1%
Philip C. Ranker, Director	984,053[(4)]	3.7%
Donald A. Williams, Director	81,000[(5)]	*
Daniel E. Geffken, Interim CFO	92,400[(6)]	*
All directors and executive officers as a group (6 persons)	2,834,507[(7)]	10.4%

* Beneficial ownership of less than 1.0% is omitted.

(1) Includes presently exercisable options to purchase 299,833 shares of common stock. Pursuant to a settlement agreement, certain securities beneficially owned by Mr. French are held in constructive trust by Mr. French for the benefit of Mr. French and his former spouse.

(2) Includes presently exercisable options to purchase 81,000 shares of common stock and presently exercisable warrants to purchase 4,032 shares of common stock.

(3) Includes presently exercisable options to purchase 81,000 shares of common stock.

(4) Includes presently exercisable options to purchase 83,500 shares of common stock.

(5) Consists of presently exercisable options to purchase 81,000 shares of common stock.

(6) Consists of presently exercisable warrants to purchase up to 92,400 shares of common stock issued to Danforth Advisors, LLC.

(7) Includes presently exercisable options to purchase 626,333 shares of common stock and presently exercisable warrants to purchase 96,432 shares of common stock.

Biographical Information Concerning Executive Officers

Biographical information concerning J. Michael French, our President and CEO, is set forth above under the caption "Proposal No. 1 — Election of Directors." Biographical information concerning our remaining executive officers is set forth below.

Daniel E. Geffken — Mr. Geffken, age 58, is a founder and managing director at Danforth Advisors, LLC, where he has served since 2011. He has worked in both the life science and renewable energy industries for the past 20 years. His work has ranged from early start-ups to publicly traded companies with market capitalizations of in excess of $1 billion. Previously, he served as chief operating officer ("COO") or CFO of four publicly traded and four privately held companies, including Seaside Therapeutics, Inc., where he served as COO from 2009 to 2011. In addition, he has been involved with multiple rare disease-focused companies in areas such as Huntington's disease, amyotrophic lateral sclerosis, fragile X syndrome, hemophilia A and Gaucher disease, including the approval of enzyme replacement therapies for the treatments of Fabry disease and Hunter syndrome. Mr. Geffken has raised more than $700 million in equity and debt securities. Mr. Geffken started his career as a C.P.A. at KPMG and, later, as a principal in a private equity firm. Mr. Geffken received his M.B.A from the Harvard Business School and his B.S. in economics from The Wharton School, University of Pennsylvania.

Director's Qualifications

In selecting a particular candidate to serve on our Board of Directors, we consider the needs of our company based on particular experiences, qualifications, attributes and skills that we believe would be advantageous for our Board members to have and would qualify such candidate to serve on our Board given our business profile and the environment in which we operate. The table below sets forth such experiences, qualifications, attributes and skills, and identifies the ones that each director and director nominee possesses.

Attributes	Mr. French	Dr. Loren	Mr. Ramelli	Mr. Ranker	Mr. Williams
Financial Experience	X	X	X	X	X
Public Board Experience	X	X		X	
Industry Experience	X	X		X	X
Scientific Experience		X			
Commercial Experience	X		X	X	X
Corporate Governance Experience	X	X		X	X
Capital Markets Experience	X	X	X	X	X
Management Experience	X	X	X	X	X

Certain Relationships and Related Transactions

J. Michael French. Pursuant to the terms and conditions of Mr. French's employment agreement, we agreed, for the term of Mr. French's employment with us, to nominate Mr. French for successive terms as a member of the Board of Directors, and to use all best efforts to cause Mr. French to be elected by our shareholders as a member of the Board of Directors.

Family Relationships

There are no familial relationships between any of our officers and directors.

Director or Officer Involvement in Certain Legal Proceedings

Our directors and executive officers were not involved in any legal proceedings as described in Item 401(f) of Regulation S-K in the past ten years.

Independence of the Board of Directors

The Board of Directors has adopted NASDAQ's standards for determining the independence of its members. In applying these standards, the Board of Directors considers commercial, industrial, banking, consulting, legal, accounting, charitable and familial relationships, among others, in assessing the independence of directors, and must disclose any basis for determining that a relationship is not material. The Board of Directors has determined that three (3) of the current members of the Board of Directors (and as a result, three (3) of the director nominees), namely Stefan Loren, Joseph Ramelli and Donald A. Williams, are independent directors within the meaning of such NASDAQ independence standards in terms of independence from management. In making these independence determinations, the Board of Directors did not exclude from consideration as immaterial any relationship potentially compromising the independence of any of the above directors or director nominees, as applicable.

Meetings of the Board of Directors

The Board of Directors held eleven meetings during 2014. During 2014, all directors attended more than 75% of the aggregate number of meetings of the Board of Directors that were held during the time that they served as members of the Board of Directors. We do not have a formal policy regarding attendance by members of the Board of Directors at the annual meeting of stockholders, but we strongly encourage all members of the Board of Directors to attend our annual meetings and expect such attendance except in the event of extraordinary circumstances. All of our directors attended our annual meeting of stockholders for the 2014 fiscal year.

Committees of the Board of Directors

The Board of Directors has established the following three standing committees: the Audit Committee, the Compensation Committee, and the Nominating and Corporate Governance Committee (the "N&CGC"). The Board of Directors has adopted written charters for each of these committees, which we make available free of charge on or through our Internet website, along with other items related to corporate governance matters, including our Code of Business Conduct and Ethics applicable to all employees, officers and directors. We maintain our Internet website at *www.marinabio.com*. You can access our committee charters and code of conduct on our website by first clicking "About Marina Biotech" and then "Corporate Governance."

We intend to disclose on our Internet website any amendments to or waivers from our Code of Business Conduct and Ethics, as well as any amendments to the charters of any of our standing committees. Any stockholder also may obtain copies of these documents, free of charge, by sending a request in writing to: Marina Biotech, Inc., P.O. Box 1559, Bothell, Washington 98041.

Currently, the Audit Committee consists of Mr. Williams (Chair) and Mr. Ramelli, the Compensation Committee consists of Dr. Loren (Chair), Mr. Williams and Mr. Ramelli, and the N&GC consists of Mr. Ramelli (Chair), Mr. Ranker and Dr. Loren. During the 2014 fiscal year, the Audit Committee held five meetings, the Compensation Committee held two meetings, and the N&GC held one meeting. All members of each standing committee during 2014 attended at least 75% of the meetings that were held during the periods when they served as members of such committee.

Audit Committee. Among other functions, the Audit Committee authorizes and approves the engagement of the independent registered public accounting firm, reviews the results and scope of the audit and other services provided by the independent registered public accounting firm, reviews our financial statements, reviews and evaluates our internal control functions, approves or establishes pre-approval policies and procedures for all professional audit and permissible non-audit services provided by the independent registered public accounting firm and reviews and approves any proposed related party transactions. The Board of Directors has determined that each of the current members of the Audit Committee is an independent director within the meaning of the NASDAQ independence standards and Rule 10A-3 promulgated by the SEC under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). In addition, the Board of Directors has determined that each of the current members of the Audit Committee qualifies as an Audit Committee Financial Expert under applicable SEC Rules and satisfies the NASDAQ standards of financial literacy and financial or accounting expertise or experience.

Compensation Committee. The Compensation Committee's functions include reviewing and approving the compensation and benefits for our executive officers, administering our equity compensation plans and making recommendations to the Board of Directors regarding these matters. Neither the Compensation Committee nor the Board of Directors retained any consultants to assist in the review and approval of the compensation and benefits for the executive officers of our company during 2014. The Board of Directors has determined that each current member of the Compensation Committee is an independent director within the meaning of the NASDAQ independence standards.

Nominating and Corporate Governance Committee. The N&CGC searches for and recommends to the Board of Directors potential nominees for director positions and makes recommendations to the Board of Directors regarding the size, composition and compensation of the Board of Directors and its committees. The Board of Directors has determined that each current member of the N&CGC is an independent director within the meaning of the NASDAQ independence standards.

In selecting candidates for the Board of Directors, the N&CGC begins by determining whether the incumbent directors whose terms expire at the annual meeting of stockholders desire and are qualified to continue their service on the Board of Directors. If there are positions on the Board of Directors for which the N&CGC will not be re-nominating an incumbent director, or if there is a vacancy on the Board of Directors, the N&CGC will solicit recommendations for nominees from persons whom the N&CGC believes are likely to be familiar with qualified candidates, including members of our Board of Directors and our senior management. The N&CGC may also engage a search firm to assist in the identification of qualified candidates. The N&CGC will review and evaluate those candidates whom it believes merit serious consideration, taking into account all available information concerning the candidate, the existing composition and mix of talent and expertise on the Board of Directors and other factors that it deems relevant. In conducting its review and evaluation, the committee may solicit the views of management and other members of the Board of Directors, and may conduct interviews of proposed candidates.

The N&CGC generally requires that all candidates for the Board of Directors be of the highest personal and professional integrity and have demonstrated exceptional ability and judgment. The N&CGC will consider whether such candidate will be effective, in conjunction with the other members of the Board of Directors, in collectively serving the long-term interests of our stockholders. In addition, the N&CGC requires that all candidates have no interests that materially conflict with our interests and those of our stockholders, have meaningful management, advisory or policy making experience, have a general appreciation of the major business issues facing us and have adequate time to devote to service on the Board of Directors.

The N&CGC will consider stockholder recommendations for nominees to fill director positions, provided that the N&CGC will not entertain stockholder nominations from stockholders who do not meet the eligibility criteria for submission of stockholder proposals under Rule 14a-8 of Regulation 14A under the Exchange Act. Stockholders may submit written recommendations for nominees to the Board of Directors, together with appropriate biographical information and qualifications of such nominees as required by our Bylaws, to our Corporate Secretary following the same procedures as described in "Stockholder Communications" in this Proxy Statement. In order for the N&CGC to consider a nominee for directorship submitted by a stockholder, such recommendation must be received by the Corporate Secretary by the time period set forth in our most recent proxy statement for the submission of stockholder proposals under Rule 14a-8 of Regulation 14A under the Exchange Act. The Corporate Secretary shall then deliver any such communications to the Chairman of the N&CGC. The N&CGC will evaluate stockholder recommendations for candidates for the Board of Directors using the same criteria as for other candidates, except that the N&CGC may consider, as one of the factors in its evaluation of stockholder recommended candidates, the size and duration of the interest of the recommending stockholder or stockholder group in our equity.

Board Leadership Structure and Role in Risk Oversight

Although we have not adopted a formal policy on whether the Chairman of the Board and Chief Executive Officer positions should be separate or combined, given our company's recent financial and operational history, we have determined that it is in the best interests of our company and its stockholders to combine those roles. At the same time, we also believe it is important that our independent directors have

a strong voice in the leadership of our company. As a result, we believe it is beneficial to our company and its stockholders that one of the independent directors of our Board serve in the capacity of Lead Independent Director. Mr. French currently serves as our CEO and as the Chairman of our Board of Directors. Dr. Loren currently serves as Lead Independent Director. We believe that the use of a Lead Independent Director is beneficial because the Lead Independent Director can provide the Chairman/CEO with guidance and feedback on his performance in those roles, as well as provide a more effective channel for the independent members of the Board to express their views on management. To further strengthen the voice of our independent directors, we provide that such directors meet on a regular basis, and we have provided that all of the members of the Audit Committee, the Compensation Committee and the N&GC are independent. The Board of Directors continually evaluates our leadership structure and could in the future decide to separate the Chairman and CEO positions if it believes that doing so would serve the best interests of our company.

Our Board of Directors and the Audit Committee thereof is responsible for overseeing the risk management processes on behalf of our company. The Board and, to the extent applicable, the Audit Committee, receive and review periodic reports from management, auditors, legal counsel and others, as considered appropriate regarding our company's assessment of risks. Where applicable, the Audit Committee reports regularly to the full Board of Directors with respect to risk management processes. The Audit Committee and the full Board of Directors focus on the most significant risks facing our company and our company's general risk management strategy, and also ensure that risks undertaken by our company are consistent with the Board's appetite for risk. While the Board oversees the risk management of our company, management is responsible for day-to-day risk management processes. We believe this division of responsibilities is the most effective approach for addressing the risks facing our company and that our Board leadership structure supports this approach.

Stockholder Communications

All stockholder communications must (i) be addressed to our Chief Executive Officer at our address, (ii) be in writing either in print or electronic format, (iii) be signed by the stockholder sending the communication, (iv) indicate whether the communication is intended for the entire Board of Directors, a committee thereof, or the independent directors, (v) if the communication relates to a stockholder proposal or director nominee, identify the number of shares held by the stockholder, the length of time such shares have been held, and the stockholder's intention to hold or dispose of such shares, provided that we will not entertain shareholder proposals or shareholder nominations from shareholders who do not meet the eligibility and procedural criteria for submission of shareholder proposals under Commission Rule 14a-8 of Regulation 14A under the Exchange Act and (vi) if the communication relates to a director nominee being recommended by the stockholder, must include appropriate biographical information of the candidate as is required by our Bylaws.

Upon receipt of a stockholder communication that is compliant with the requirements identified above, the Chief Executive Officer shall promptly deliver such communication to the appropriate member(s) of the Board of Directors or committee member(s) identified by the stockholder as the intended recipient of such communication by forwarding the communication to either the chairman of the Board of Directors with a copy to the CEO, the chairman of the applicable committee, or to each of the independent directors, as the case may be.

The Chief Executive Officer may, in his or her sole discretion and acting in good faith, provide copies of any such stockholder communication to any one or more of our directors and executive officers, except that in processing any stockholder communication addressed to the independent directors, the Chief Executive Officer may not copy any member of management in forwarding such communications. In addition, the Chief Executive Officer may, in his or her sole discretion and acting in good faith, not forward certain items if they are deemed of a commercial or frivolous nature or otherwise inappropriate for consideration by the intended recipient and any such correspondence may be forwarded elsewhere in our company for review and possible response.

PROPOSAL NO. 2

RATIFICATION OF APPOINTMENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have appointed Wolf & Company, P.C. ("Wolf") to serve as our independent registered public accounting firm for the fiscal year ending December 31, 2015. Wolf has served as our independent registered public accounting firm since May 2014. In the event that ratification of this appointment of independent registered public accounting firm is not approved by the affirmative vote of a majority of votes cast on the matter, then the appointment of our independent registered public accounting firm will be reconsidered by us.

Your ratification of the appointment of Wolf as our independent registered public accounting firm for the fiscal year ending December 31, 2015 does not preclude us from terminating its engagement of Wolf and retaining a new independent registered public accounting firm, if we determine that such an action would be in our best interest.

Total fees to our independent registered public accounting firms for the years ended December 31, 2014 and 2013 were $0.124 million and $0.085 million, respectively, and were comprised of the amounts set forth below.

Audit Fees. The aggregate fees for professional services rendered in connection with (i) the audit of our annual financial statements, (ii) the review of the financial statements included in our Quarterly Reports on Form 10-Q for the quarters ended March 31, June 30 and September 30, (iii) consents and comfort letters issued in connection with equity offerings and (iv) services provided in connection with statutory and regulatory filings or engagements were $0.117 million for the year ended December 31, 2014 and $0.085 million for the year ended December 31, 2013.

Audit-Related Fees. The aggregate fees related to audits that are not included in the above were $0.007 million for the year ended December 31, 2014. We did not incur any fees related to audits for the year ended December 31, 2013 that are not included in the above.

Tax Fees. We did not incur any fees to our independent registered public accounting firm for professional services rendered in connection with tax compliance, tax planning and federal and state tax advice for the years ended December 31, 2014 and December 31, 2013.

All Other Fees. We did not incur any such other fees to our independent registered public accounting firm for the years ended December 31, 2014 and December 31, 2013.

Pre-Approval Policies and Procedures

The Audit Committee has the authority to appoint or replace our independent registered public accounting firm (subject, if applicable, to stockholder ratification). The Audit Committee is also responsible for the compensation and oversight of the work of the independent registered public accounting firm (including resolution of disagreements between management and the independent registered public accounting firm regarding financial reporting) for the purpose of preparing or issuing an audit report or related work. The independent registered public accounting firm was engaged by, and reports directly to, the Audit Committee.

The Audit Committee pre-approves all audit services and permitted non-audit services (including the fees and terms thereof) to be performed for us by our independent registered public accounting firm, subject to the *de minimis* exceptions for non-audit services described in Section 10A(i)(1)(B) of the Exchange Act and Rule 2-01(c)(7)(i)(C) of Regulation S-X, provided that all such excepted services are subsequently approved prior to the completion of the audit. In the event pre-approval for such audit services and permitted non-audit services cannot be obtained as a result of inherent time constraints in the matter for which such services are required, the Chairman of the Audit Committee had been granted the authority to pre-approve such services, provided that the estimated cost of such services on each such occasion does not exceed $15,000, and the Chairman of the Audit Committee reported for ratification such pre-approval to the Audit Committee at its next scheduled meeting. We have complied with the procedures set forth above, and the Audit Committee has otherwise complied with the provisions of its charter.

Vote Required and Board of Directors' Recommendation

Assuming a quorum is present, the affirmative vote of a majority of the shares present at the Annual Meeting and entitled to vote, either in person or by proxy, is required for approval of Proposal No. 2. For purposes of the ratification of our independent registered public accounting firm, abstentions will have the same effect as a vote against this proposal and broker non-votes will have no effect on the result of the vote.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 2.

PROPOSAL NO. 3

ADVISORY VOTE ON EXECUTIVE COMPENSATION

We are providing stockholders an advisory vote on executive compensation. This nonbinding vote is required under Section 14A of the Exchange Act. At our Annual Meeting of Stockholders held in September 2014, our stockholders indicated their preference that the advisory vote on executive compensation be held on an annual basis, and we intend to seek an advisory vote on executive compensation annually.

The section entitled "Executive Compensation" describes the compensation of our chief executive officer and our other most highly compensated executive officers during the 2014 fiscal year. Our executive officers are referred to in this Proposal No. 3 as our named executive officers. Other than J. Michael French, our president and chief executive officer, our only other named executive officer during the 2014 fiscal year was Daniel E. Geffken, who was appointed to serve as our interim chief financial officer on May 13, 2014.

Our Board of Directors believes that the policies, procedures and compensation articulated in the "Executive Compensation" section of this proxy statement are appropriate for our company, and that the compensation of our named executive officers in 2014 reflects and supports these compensation policies and procedures.

In particular, and as further described in the "Executive Compensation" section of this proxy statement, we note that Mr. French worked for a reduced wage during a significant portion of each of the 2012 and 2013 fiscal years, and agreed to settle outstanding compensation obligations with respect to such fiscal years in the amount of $415,000 in return for the issuance of 1,130,000 shares of common stock. With respect to Mr. Geffken, we note that the amount paid to him during the 2014 fiscal year as set forth in the summary compensation table represents the portion that he received of the aggregate consulting fee that we paid to Danforth Advisors, LLC ("Danforth") pursuant to that certain Consulting Agreement, effective as of January 9, 2014, that we entered into with Danforth. Mr. Geffken is a founder and managing director at Danforth. None of our named executive officers received any incentive or bonus compensation with respect to the 2014 fiscal year. Further, we did not pay any bonus or incentive compensation to our named executive officers during 2014.

We are asking our stockholders to indicate their support at the Annual Meeting for the compensation of our named executive officers as described in this proxy statement. This vote is intended to provide an overall assessment of our policies and procedures relating to the compensation of our named executive officers, rather than focus on any specific item of compensation. Accordingly, we are recommending that our stockholders vote FOR the following resolution:

> RESOLVED, that the stockholders of Marina Biotech, Inc. approve, on an advisory basis, the compensation of the named executive officers of Marina Biotech, Inc., as disclosed in this proxy statement for the 2015 Annual Meeting of Stockholders pursuant to Item 402 of Regulation S-K, including, as applicable, the Summary Compensation Table and the other related tables and disclosures contained in the section of this proxy statement captioned "Executive Compensation".

This advisory vote on executive compensation, commonly referred to as a 'say-on-pay' advisory vote, is not binding on our Board of Directors. However, our Board of Directors will take into account the result of the vote when determining future executive compensation arrangements.

Vote Required and Board of Directors' Recommendation

Assuming a quorum is present, the affirmative vote of a majority of the shares present at the Annual Meeting, either in person or by proxy, and entitled to vote, is required for approval of this Proposal No. 3. Because your vote is advisory, it will not be binding upon our Board of Directors. For purposes of the approval of Proposal No. 3, abstentions will have the same effect as a vote against this proposal, and broker non-votes will have no effect on the result of the vote.

THE BOARD OF DIRECTORS UNANIMOUSLY RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 3.

REPORT OF THE AUDIT COMMITTEE OF THE BOARD OF DIRECTORS

The Audit Committee of the Board of Directors, on behalf of the Board of Directors, serves as an independent and objective party to monitor and provide general oversight of the integrity of our financial statements, the independent registered public accounting firm's qualifications and independence, the performance of the independent registered public accounting firm, the compliance by us with legal and regulatory requirements and our standards of business conduct. The Audit Committee performs these oversight responsibilities in accordance with its Audit Committee Charter.

Our management is responsible for preparing our financial statements and our financial reporting process. Our independent registered public accounting firm is responsible for performing an independent audit of our consolidated financial statements in accordance with the standards of the Public Company Accounting Oversight Board (United States). The Audit Committee's responsibility is to administer and oversee these processes.

The Audit Committee met with the independent registered public accounting firm, with and without management present, to discuss the audit plan, the results of their examinations, and the overall quality of our financial reporting.

In this context, the Audit Committee has reviewed and discussed the audited financial statements for the year ended December 31, 2014 with management and with the independent registered public accounting firm. The Audit Committee has discussed with the independent registered public accounting firm the matters required to be discussed by Auditing Standard No. 16, *Communications with Audit Committees*, which includes, among other items, matters related to the conduct of the audit of our annual financial statements.

The Audit Committee has also received the written disclosures and the letter from the independent registered public accounting firm required by applicable requirements of the Public Company Accounting Oversight Board regarding the independent accountant's communications with the Audit Committee concerning independence, and has discussed with the independent registered public accounting firm the issue of its independence from us and management. In addition, the Audit Committee has considered whether the provision of any non-audit services by the independent registered public accounting firm in 2014 is compatible with maintaining the registered public accounting firm's independence and has concluded that it is.

Based on its review of the audited financial statements and the various discussions noted above, the Audit Committee recommended to the Board of Directors that the audited financial statements be included in our Annual Report on Form 10-K for the year ended December 31, 2014.

Each of the members of the Audit Committee is independent as defined under the standards of the SEC and NASDAQ, and meets all other requirements of such rules of the SEC.

Respectfully submitted by the Audit Committee,

Donald A. Williams, Chairman
Joseph W. Ramelli

The foregoing Audit Committee Report does not constitute soliciting material and shall not be deemed filed or incorporated by reference into any other Company filing under the Securities Act of 1933, as amended, or the Exchange Act, except to the extent we specifically incorporate this Audit Committee Report by reference therein.

EXECUTIVE COMPENSATION

Summary Compensation Table

The following table sets forth information regarding compensation earned during 2014 and 2013 by our CEO and our other most highly compensated executive officers as of the end of the 2014 fiscal year ("Named Executive Officers").

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)	Option Awards ($)[3]	All Other Compensation ($)	Total ($)
J. Michael French, President, CEO and Director	2014	288,083[1]	—	—	774,929	—	1,063,012
	2013	127,500	—	—	—	—	127,500
Daniel E. Geffken, Interim CFO[2]	2014	—	—	—	—	136,422	136,422

(1) Although Mr. French's employment agreement provides for an annual base salary of $340,000, due to our company's financial challenges in 2012 and 2013 he worked for a reduced wage during a significant portion of each of those fiscal years. Mr. French agreed to settle outstanding compensation obligations with respect to the 2012 and 2013 fiscal years in the amount of $415,000 in return for the issuance of 1,130,000 shares of common stock. We approved the issuance of these shares to Mr. French, which were valued based on the volume weighted average price of our common stock for the ten trading days ending December 31, 2013 (i.e., $0.33), in January 2014.

(2) Mr. Geffken was appointed to serve as our interim chief financial officer on May 13, 2014. Mr. Geffken is compensated for his services in this position pursuant to a Consulting Agreement, effective as of January 9, 2014, that we entered into with Danforth Advisors, LLC ("Danforth"). Mr. Geffken is a founder and managing director at Danforth. We paid an aggregate amount of $299,947 to Danforth during the 2014 fiscal year pursuant to the terms of the Consulting Agreement, of which amount Danforth paid $136,422 to Mr. Geffken, with the remainder being paid by Danforth to third-party contractors who performed services under the Consulting Agreement or being utilized for entity expenses. Upon the effectiveness of the Consulting Agreement, we issued to Danforth 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and shall vest on a monthly basis over the two-year period beginning on the effective date of the Consulting Agreement.

(3) Represents the aggregate grant date fair value under FASB ASC Topic 718 of options to purchase shares of our common stock granted during 2014. On September 15, 2014, pursuant to the Amended and Restated Employment Agreement that we entered into with Mr. French, we granted ten-year options to Mr. French to purchase up to 771,000 shares of common stock at an exercise price of $1.07 per share, of which 257,000 options shall vest on the first anniversary of the grant date, and 514,000 options shall vest in 24 equal monthly installments commencing after the first anniversary of the grant date and shall be vested in full on the third anniversary of the grant date.

Narrative Disclosures Regarding Compensation; Employment Agreements

We have entered into an employment agreement with Mr. French, which was amended and restated on September 15, 2014, and a consulting agreement with Danforth, an entity controlled by Mr. Geffken. The terms and conditions of these agreements are summarized below.

J. Michael French Employment Agreement

On June 10, 2008, we entered into an employment agreement (the "Original French Agreement") with J. Michael French pursuant to which Mr. French served as our president and our CEO. The initial term began on June 23, 2008 and ended on June 9, 2011. Thereafter, it continued per its terms on a quarter-to-quarter basis. On September 15, 2014, we entered into an Amended and Restated Employment Agreement (the "Restated French Agreement") with Mr. French pursuant to which Mr. French shall serve

as our President and CEO until September 14, 2017. A copy of the Original French Agreement was filed as Exhibit 10.2 to our Current Report on Form 8-K dated June 10, 2008, and a copy of the Restated French Agreement was filed as Exhibit 10.1 to our Current Report on Form 8-K dated September 15, 2014.

Pursuant to the Original French Agreement, Mr. French was entitled to annual base compensation of $340,000, which amount was increased to $425,000 in the Restated French Agreement. He is also eligible to receive annual performance-based incentive cash compensation, with the targeted amount of such incentive cash compensation being 40% of his annual base compensation for the year under the Original French Agreement, and 50% of his annual base compensation for the year under the Restated French Agreement, but with the actual amount to be determined by the Board or the Compensation Committee.

We agreed in the Restated French Agreement to pay to Mr. French a lump sum within thirty (30) days following full execution of the Restated French Agreement, with such amount being the excess of Mr. French's base salary under the Restated French Agreement from April 1, 2014 through September 15, 2014, over whatever compensation we had paid to Mr. French as base salary during such period.

Under the Original French Agreement, we granted options to Mr. French to purchase up to 31,500 shares of common stock, of which 10,500 options were exercisable at $50.80 per share, 10,500 options were exercisable at $90.80 per share, and 10,500 options were exercisable at $130.80 per share. The options had a term of 10 years beginning on June 23, 2008. Mr. French has agreed to cancel these options effective as of December 31, 2014. Under the Restated French Agreement, we granted ten-year options to Mr. French to purchase up to 771,000 shares of common stock at an exercise price of $1.07 per share, of which 257,000 options shall vest on the first anniversary of the grant date, 257,000 options shall vest monthly in equal installments commencing after the first anniversary of the grant date and shall be vested in full on the second anniversary of the grant date, and 257,000 options shall vest monthly commencing after the second anniversary of the grant date and shall be vested in full on the third anniversary of the grant date.

If Mr. French's employment under the Restated French Agreement is terminated without cause or he chooses to terminate his employment for good reason, all of Mr. French's options that are outstanding on the date of termination shall be fully vested and exercisable upon such termination and shall remain exercisable for the remainder of their terms. In addition, he will receive (i) base salary, (ii) incentive cash compensation determined on a pro-rated basis as to the year in which the termination occurs, (iii) pay for accrued but unused paid time off, and (iv) reimbursement for expenses through the date of termination, plus an amount equal to 12 months of his specified base salary at the rate in effect on the date of termination.

If Mr. French's employment under the Restated French Agreement is terminated for cause or he chooses to terminate his employment other than for good reason, vesting of the options shall cease on the date of termination and any then unvested options shall terminate, however the then-vested options shall remain vested and exercisable for the remainder of their respective terms. He will also receive salary, pay for accrued but unused paid time off, and reimbursement of expenses through the date of termination.

If Mr. French's employment under the Restated French Agreement is terminated due to death or disability, Mr. French or his estate, as applicable, is entitled to receive (i) salary, reimbursement of expenses, and pay for accrued but unused paid time off; (ii) incentive cash compensation determined on a pro-rated basis as to the year in which the termination occurs; and (iii) a lump sum equal to base salary at the rate in effect on the date of termination for the lesser of (A) twelve (12) months and (B) the remaining term of the Employment Agreement at the time of such termination. In addition, vesting of all of Mr. French's options that are outstanding on the date of termination shall cease, and any then vested options shall remain exercisable as specified in the applicable grant agreements.

If Mr. French's employment under the Restated French Agreement is terminated by us (other than for cause) or by Mr. French (for good reason), and in either case other than because of death or disability, during the one-year period following a change in control of our company, then Mr. French will be entitled to receive as severance: (i) salary, expense reimbursement and pay for unused paid time off through the date of termination; and (ii) a lump-sum amount equal to twelve (12) months of base salary at the rate in effect on the date of termination. In addition, all of Mr. French's outstanding stock options shall be fully vested and exercisable upon a change of control and shall remain exercisable as specified in the option grant agreements.

Pursuant to the Restated French Agreement, a change in control generally means (i) the acquisition by any person or group of 40% or more of our voting securities, (ii) our reorganization, merger or consolidation, or sale of all or substantially all of our assets, following which our stockholders prior to the consummation of such transaction hold 60% or less of the voting securities of the surviving or acquiring entity, as applicable, (iii) a turnover of the majority of the Board as currently constituted, provided that under most circumstances any individual approved by a majority of the incumbent Board shall be considered as a member of the incumbent Board of Directors for this purpose, or (iv) a complete liquidation or dissolution of our company.

The Restated French Agreement also provides that we shall cause the nomination and recommendation of Mr. French for election as a director at the annual meetings of our stockholders that occur during the employment term, and use all best efforts to cause Mr. French to be elected as a non-independent director.

In general, Mr. French has agreed in the Restated French Agreement not to compete with us during the employment term and for six months thereafter, to solicit our partners, consultants or employees for one year following the end of the employment term, or to solicit our clients during the employment term and for twelve months thereafter.

Daniel E. Geffken Consulting Agreement

We have entered into a Consulting Agreement, effective as of January 9, 2014, with Danforth, pursuant to which we engaged Danforth to serve as an independent consultant for the purpose of providing us with certain strategic and financial advice and support services during the one-year period beginning on January 9, 2014. In January 2015, we extended the term of the Consulting Agreement to January 2016. Mr. Geffken, who was appointed to serve as our interim chief financial officer on May 13, 2014, is a founder and managing director at Danforth. We paid to Danforth approximately $299,947 during 2014, of which amount Danforth paid $136,422 to Mr. Geffken, with the remainder being paid by Danforth to third-party contractors who performed services under the Consulting Agreement or being utilized for entity expenses. We also issued to Danforth, upon the effectiveness of the consulting agreement, 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and shall vest on a monthly basis over the two-year period beginning on the effective date of the consulting agreement. The Consulting Agreement may be terminated by either party thereto: (a) with Cause (as defined below), upon thirty (30) days prior written notice; or (b) without Cause upon sixty (60) days prior written notice. “Cause” shall include: (i) a breach of the terms of the Consulting Agreement which is not cured within thirty (30) days of written notice of such default or (ii) the commission of any act of fraud, embezzlement or deliberate disregard of a rule or policy of our company.

Outstanding Equity Awards at Fiscal Year End

2014 Outstanding Equity Awards at Fiscal Year-end Table

The following table sets forth information regarding the outstanding equity awards held by our Named Executive Officers as of the end of our 2014 fiscal year:

	Option Awards					Stock Awards			
Name	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested ($)
J. Michael French[1]	—	771,000[2]	—	$1.07	9/15/24	—	—	—	—
Daniel E. Geffken[3]	—	—	—	$ —	—	—	—	—	—

(1) As per an agreement between Mr. French and our company, options to purchase up to 88,972 shares of common stock previously granted to Mr. French were cancelled effective as of December 31, 2014.

(2) One-third of these options vested on September 15, 2015. The remaining options shall vest in 24 equal monthly installments during the two-year period commencing after September 15, 2015.

(3) Pursuant to the Consulting Agreement, effective as of January 9, 2014, that we entered into with Danforth, an entity controlled by Mr. Geffken, we issued to Danforth, upon the effectiveness of the Consulting Agreement, 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and vest on a monthly basis over the two-year period beginning on January 9, 2014.

Option re-pricings

We have not engaged in any option re-pricings or other modifications to any of our outstanding equity awards to our Named Executive Officers during fiscal year 2014.

Compensation of Directors

2014 Director Compensation Table

The following Director Compensation table sets forth information concerning compensation for services rendered by our independent directors for fiscal year 2014.

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)	Option Awards ($)[3]	All Other Compensation ($)	Total ($)
Stefan C. Loren, Ph.D.[1][2]	$ 32,500	—	$15,579	—	$ 48,079
Joseph W. Ramelli[1][2]	32,500	—	15,579	—	48,079
Philip C. Ranker[2]	32,500	—	15,579		48,079
Donald A. Williams[4]	22,500	—	15,579	—	38,079
Total	$120,000	—	$62,316	—	$182,316

(1) Due to our financial condition prior to March 2014, neither Dr. Loren nor Mr. Ramelli, each of whom was appointed in August 2012, received any cash payments during 2012 or 2013 in connection with their service to our company. However, in January 2014 we issued to each such non-employee director 151,000 shares of common stock in lieu of approximately $50,000 of fees otherwise due to such director with respect to his service on the Board representing approximately $10,000 of fees from the period August 2012 through December 2012 and approximately $40,000 of fees for 2013. The number of shares issued to each of Dr. Loren and Mr. Ramelli was based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33).

(2) On January 1, 2014, we issued 30,303 shares of our common stock to each of Dr. Loren, Mr. Ramelli and Mr. Ranker, in lieu of a cash payment in the amount of $10,000, as compensation for service on our Board of Directors during the first quarter of 2014. The number of shares issued to each director was based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33).

(3) Represents the aggregate grant date fair value under FASB ASC Topic 718 of options to purchase shares of our common stock granted during 2014. On September 15, 2014, we granted to each of our non-employee directors options to purchase up to an aggregate of 62,000 shares of our common stock at an exercise price of $1.07 per share, of which 43,000 options represented the initial option grant to such non-employee directors, and 19,000 options represented the option grant covering service during the third and fourth quarters of 2014.

(4) Mr. Williams became a member of our Board of Directors on September 15, 2014.

As of December 31, 2014, Dr. Loren, Mr. Ramelli and Mr. Williams each held options to purchase up to 62,000 shares of our common stock, and Mr. Ranker held options to purchase up to 64,500 shares of our common stock.

J. Michael French, current director, has not been included in the Director Compensation Table because he is a Named Executive Officer and does not receive any additional compensation for services provided as a director.

2014 Director Compensation Program: On January 1, 2014, our Board approved a compensation program for non-employee directors during the 2014 calendar year that consisted of an annual fee of $40,000, payable in advance. We paid the portion of this annual fee attributable to the first quarter of 2014 by the issuance of 30,303 shares of our common stock to each of our non-employee directors who served as members of our Board of Directors during the first quarter of 2014, with the number of shares issued to each director being based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33). On September 15, 2014, the Board revised the compensation program for non-employee directors, effective starting in the third quarter of 2014, so that it would consist of: (i) an initial grant of 5-year options to purchase up to 43,000 shares of our common stock, which options shall vest 50% immediately and 50% after one year; (ii) an annual grant of 5-year options to purchase up to 38,000 shares of our common stock, which options shall vest 50% immediately and 50% after one year; and (iii) an annual cash payment of $45,000 per year, payable quarterly in advance.

Equity Compensation Plan Information

The following table provides aggregate information as of the end of the 2014 fiscal year with respect to all of the compensation plans under which our common stock is authorized for issuance, including our 2004 Stock Incentive Plan (the "2004 Plan"), our 2008 Stock Incentive Plan (the "2008 Plan") and our 2014 Long-Term Incentive Plan (the "2014 Plan"):

	Number of Securities to be Issued Upon Exercise of Outstanding Options	Weighted-Average Exercise Price of Outstanding Options	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a))
Equity compensation plans approved by security holders	1,084,106[(1)]	5.52	8,412,519
Total	1,084,106	5.52	8,412,519

(1) Consists of: (i) 106 shares of common stock underlying awards made pursuant to the 2004 Plan, (ii) 45,000 shares of common stock underlying awards made pursuant to the 2008 Plan and (iii) 1,039,000 shares of common stock underlying awards made pursuant to the 2014 Plan.

SUBMISSION OF STOCKHOLDER PROPOSALS

We intend to hold our 2016 annual meeting of stockholders (the "2016 Annual Meeting") in September 2016. To be considered for inclusion in our notice of annual meeting and proxy statement for, and for presentation at, the 2016 Annual Meeting, a stockholder proposal must be received by the Corporate Secretary, Marina Biotech, Inc., P.O. Box 1559, Bothell, Washington 98041, no later than June 1, 2016, and must otherwise comply with applicable rules and regulations of the SEC, including Rule 14a-8 of Regulation 14A under the Exchange Act.

Our Bylaws require advance notice of any proposal by a stockholder intended to be presented at an annual meeting that is not included in our notice of annual meeting and proxy statement because it was not timely submitted under the preceding paragraph, or made by or at the direction of any member of the Board of Directors, including any proposal for the nomination for election as a director. To be considered for such presentation at the 2016 Annual Meeting, any such stockholder proposal must be received by the Corporate Secretary, Marina Biotech, Inc., no earlier than June 18, 2016 and no later than August 2, 2016, provided, that if the 2016 Annual Meeting is scheduled to be held on a date more than 30 days before the anniversary date of the 2015 annual meeting of stockholders or more than 60 days after the anniversary date of the 2015 annual meeting of stockholders, a stockholder's proposal shall be timely if delivered to, or mailed to and received by, our company not later than the close of business on the later of (A) the 75th day prior to the scheduled date of the 2016 Annual Meeting, or (B) the 15th day following the day on which public announcement of the date of the 2016 Annual Meeting is first made by us, and in any case discretionary authority may be used if such proposal is untimely submitted.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires our executive officers and directors, and persons who own more than 10% of a registered class of our equity securities ("Reporting Persons"), to file reports of ownership and changes in ownership with the SEC and with NASDAQ. Based solely on our review of the reports filed by Reporting Persons, and written representations from certain Reporting Persons that no other reports were required for those persons, we believe that, during the year ended December 31, 2014, the Reporting Persons met all applicable Section 16(a) filing requirements, other than Mr. Geffken, who was not timely with respect to the filing of the Initial Statement of Beneficial Ownership of Securities on Form 3 necessitated by his appointment as our interim chief financial officer in May 2014, and Mr. Williams, who was not timely with respect to the Statement of Changes in Beneficial Ownership of Securities on Form 4 necessitated by the grant to him of options to purchase shares of our common stock on September 15, 2014.

OTHER MATTERS

We will furnish without charge to each person whose proxy is being solicited, upon the written request of any such person, a copy of our Annual Report on Form 10-K for the fiscal year ended December 31, 2014, as filed with the SEC, including the financial statements. Requests for copies of such Annual Report on Form 10-K should be directed to J. Michael French, President & CEO, Marina Biotech, Inc., P.O. Box 1559, Bothell, Washington 98041.

Our Board of Directors does not know of any other matters that are to be presented for action at the Annual Meeting. If any other matters are properly brought before the Annual Meeting or any adjournments thereof, the persons named in the enclosed proxy will have the discretionary authority to vote all proxies received with respect to such matters in accordance with their best judgment.

It is important that the proxies be returned promptly and that your shares are represented at the Annual Meeting. Stockholders are urged to mark, date, execute and promptly return the accompanying proxy card in the enclosed envelope.

By order of the Board of Directors,

/s/ J. Michael French
J. Michael French
President & CEO

September 29, 2015
New York, NY

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

Form 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2014

Commission File Number 000-13789

MARINA BIOTECH, INC.
(Exact name of registrant as specified in its charter)

Delaware	**11-2658569**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
P.O. Box 1559 Bothell, Washington	**98041**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code:
(425) 892-4322

Securities registered pursuant to Section 12(b) of the Act: None

Securities registered pursuant to Section 12(g) of the Act:

Common Stock, $0.006 par value

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☑

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ☐ No ☑

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☑ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

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	☑

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act.) Yes ☐ No ☑

The aggregate market value of the voting stock held by non-affiliates of the registrant was approximately $14.9 million as of June 30, 2014 based upon the closing price of $0.65 per share on the OTC Pink reported on June 30, 2014.

As of February 17, 2015, there were 25,525,716 shares of the registrant's $0.006 par value common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

None

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MARINA BIOTECH, INC.

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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These forward-looking statements reflect our current views with respect to future events or our financial performance, and involve certain known and unknown risks, uncertainties and other factors, including those identified below, those discussed in Item 1A of this report under the heading "Risk Factors," and those discussed in our other filings with the Securities and Exchange Commission, which may cause our or our industry's actual or future results, levels of activity, performance or achievements to differ materially from those expressed or implied by any forward-looking statements or from historical results. We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act and Section 21E of the Exchange Act. Forward-looking statements include information concerning our possible or assumed future results of operations and statements preceded by, followed by, or that include the words "may," "will," "could," "would," "should," "believe," "expect," "plan," "anticipate," "intend," "estimate," "predict," "potential" or similar expressions.

Forward-looking statements are inherently subject to risks and uncertainties, many of which we cannot predict with accuracy and some of which we might not even anticipate. Although we believe that the expectations reflected in such forward-looking statements are based upon reasonable assumptions at the time made, we can give no assurance that such expectations will be achieved. Future events and actual results, financial and otherwise, may differ materially from the results discussed in the forward-looking statements. Readers are cautioned not to place undue reliance on these forward-looking statements. We undertake no obligation to publicly update or revise any forward-looking statements after the date of this Annual Report on Form 10-K or to conform them to actual results, new information, future events or otherwise, except as otherwise required by securities and other applicable laws.

The following factors, among others, could cause our or our industry's future results to differ materially from historical results or those anticipated:

- *our ability to obtain additional and substantial funding for our company;*
- *our ability to attract and/or maintain research, development, commercialization and manufacturing partners;*
- *the ability of our company and/or a partner to successfully complete product research and development, including pre-clinical and clinical studies and commercialization;*
- *the ability of our company and/or a partner to obtain required governmental approvals, including product and patent approvals;*
- *the ability of our company and/or a partner to develop and commercialize products that can compete favorably with those of our competitors;*
- *the timing of costs and expenses related to the research and development programs of our company and/or our partners;*
- *the timing and recognition of revenue from milestone payments and other sources not related to product sales;*
- *our ability to obtain suitable facilities in which to conduct our planned business operations on acceptable terms and on a timely basis;*
- *our ability to satisfy our disclosure obligations under the Securities Exchange Act of 1934 and to maintain the registration of our common stock thereunder;*
- *our ability to attract and retain qualified officers, employees and consultants on a timely basis as we seek to re-start our research and development activities and other business operations; and*
- *costs associated with any product liability claims, patent prosecution, patent infringement lawsuits and other lawsuits.*

These factors are the important factors of which we are currently aware that could cause actual results, performance or achievements to differ materially from those expressed in any of our forward-looking statements. We operate in a continually changing business environment, and new risk factors emerge from time to time. Other unknown or unpredictable factors also could have material adverse effects on our future results, performance or achievements. We cannot assure you that projected results or events will be achieved or will occur.

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PART I

ITEM 1. *Business.*

OVERVIEW, BUSINESS STRATEGY AND RECENT EVENTS

We are a biotechnology company focused on the discovery, development and commercialization of nucleic acid-based therapies to treat orphan diseases. Our pipeline includes CEQ508, a product in clinical development for the treatment of Familial Adenomatous Polyposis ("FAP"), for which we have received Orphan Drug Designation ("ODD") from the U.S. Food and Drug Administration ("FDA"), and preclinical programs for the treatment of type 1 myotonic dystrophy ("DM1") and Duchenne muscular dystrophy ("DMD"). We will need additional capital in order to execute on our strategy to initiate the registration trial for and to commercialize CEQ508, and to file Investigational New Drug ("IND") applications for both DM1 and DMD and to bring these two programs to human proof-of-concept. We are currently pursuing both non-dilutive means of obtaining such capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining such capital, primarily through the offering of our equity and debt securities.

Since 2010, we have strategically acquired/in-licensed and further developed nucleic acid chemistry and delivery-related technologies in order to establish a novel and differentiated drug discovery platform. This platform allows us to distinguish ourselves from others in the nucleic acid therapeutics area in that we are the only company capable of creating a wide variety of therapeutics targeting coding and non-coding RNA via multiple mechanisms of action such as RNA interference ("RNAi"), messenger RNA translational inhibition, exon skipping, microRNA ("miRNA") replacement, miRNA inhibition, and steric blocking in order to modulate gene expression either up or down depending on the specific mechanism of action. Our goal is to improve the lives of the patients and families affected by orphan diseases through either our own efforts or those of our collaborators and licensees.

The breath of our discovery platform allows us to pursue the most appropriate nucleic acid-based therapeutic approach, which is necessary to effectively modulate targets for a specific disease indication, many of which are considered undruggable by traditional methodologies. Each approach, i.e. small interfering RNA ("siRNA"), miRNA or single-strand oligonucleotide, has its advantages and disadvantages, and we can screen across multiple mechanisms of action to identify the most effective therapeutic. We believe this capability makes us unique amongst our peers. Currently, we employ our platform through our own efforts and those of our partners and licensees, to discover and develop multiple nucleic acid-based therapeutics including siRNA, miRNA mimics and single stranded oligonucleotide-based compounds. Our pipeline is orphan disease focused and includes a clinical program in FAP and preclinical programs in DM1 and DMD. Our licensees, ProNAi Therapeutics, Inc. ("ProNAi"), Mirna Therapeutics, Inc. ("Mirna") and MiNA Therapeutics, Ltd. ("MiNA"), are focused on oncology and have clinical programs in recurrent or refractory non-Hodgkin's lymphoma and unresectable primary liver cancer or solid cancers with liver involvement. We hope to continue to establish similar license agreements with additional biotechnology companies as well as larger therapeutic area-focused collaborative and strategic alliances with pharmaceutical companies.

We have entered into multiple licenses for our technology. The following agreements continue to provide upside opportunity for our company in the form of milestones and/or royalties:

- *Mirna* — In December 2011, we entered into an exclusive license agreement with Mirna, a privately-held biotechnology company pioneering miRNA replacement therapy for cancer, regarding the development and commercialization of miRNA-based therapeutics utilizing Mirna's proprietary miRNAs and our novel SMARTICLES®-based liposomal delivery technology ("SMARTICLES"). In December 2013, we amended this agreement such that Mirna paid certain pre-payments to us and now has additional rights to its lead program, MRX34, currently in Phase 1 clinical development. In addition, Mirna optioned exclusivity on several additional miRNA targets. We could receive up to an additional $45 million in clinical and commercialization milestone payments, as well as royalties in the low single digit percentages on sales, based on the successful outcome of the collaboration.

- *ProNAi* — In March 2012, we entered into an exclusive license agreement with ProNAi, a privately-held biotechnology company pioneering DNA interference ("DNAi") therapies for cancer, regarding the development and commercialization of DNAi-based therapeutics utilizing SMARTICLES. We could receive up to $14 million for each gene target in total upfront, clinical and commercialization milestone payments, as well as royalties in the single digit percentages on sales, with ProNAi having the option to select any number of additional gene targets. For example, if ProNAi licenses five products over time under the license agreement, we could receive up to $70 million in total milestones, plus royalties.

- *Monsanto Company* — In May 2012, we entered into a worldwide exclusive license agreement with Monsanto Company ("Monsanto"), a global leader in agriculture and crop sciences, covering the agricultural applications for our delivery and chemistry technologies. We could receive royalties on product sales in the low single digit percentages based on the successful outcome of the collaboration.

- *Avecia Nitto Denko* — In May 2012, we entered into a strategic alliance with Girindus Group, now Avecia Nitto Denko ("Avecia"), a leader in process development, analytical method development and current good manufacturing practices ("cGMP") manufacture of oligonucleotide therapeutics, regarding the development, supply and commercialization of certain oligonucleotide constructs using our conformationally restricted nucleotide ("CRN") technology. We could receive single digit percentage royalties on the sales of research reagents utilizing our CRN technology.

- *Rosetta Genomics* — In April 2014, we entered into a strategic alliance with Rosetta Genomics, Ltd. ("Rosetta") to identify and develop miRNA-based products designed to diagnose and treat various neuromuscular diseases and dystrophies. Under the terms of the alliance, Rosetta will apply its industry leading miRNA discovery expertise for the identification of miRNAs involved in the various dystrophy diseases. If the miRNA is determined to be correlative to the disease, Rosetta may further develop the miRNA into a diagnostic for patient identification and stratification. If the miRNA is determined to be involved in the disease pathology and represents a potential therapeutic target, we may develop the resulting miRNA-based therapeutic for clinical development. The alliance is exclusive as it relates to neuromuscular diseases and dystrophies, with both companies free to develop and collaborate outside this field both during and after the terms of the alliance.

- *MiNA* — In December 2014, we entered into a license agreement with MiNA regarding the development and commercialization of small activating RNA-based therapeutics utilizing SMARTICLES. We received an upfront fee of $0.5 million in January 2015. We could receive up to an additional $49 million in clinical and commercialization milestone payments, as well as royalties on sales, based on the successful development of MiNA's product candidates.

Our business strategy is two-fold:

Our strategy is to discover and develop our own pipeline of nucleic acid-based compounds in order to commercialize drug therapies to treat orphan diseases. Orphan diseases are broadly defined as those rare disorders that typically affect no more than one person out of every 1,500 people. The United States Orphan Drug Act of 1983 was created to promote the development of new drug therapies for the treatment of diseases that affect fewer than 200,000 individuals in the United States. Specifically, an orphan disease is a disease for which a regulatory agency, i.e. FDA or European Medicines Agency ("EMA"), can grant ODD to a compound being developed to treat that particular disease. In other words, if the FDA will grant ODD for a compound being developed to treat a disease, then that disease is an orphan disease. The purpose of such designations is to incentivize pharmaceutical and biotechnology companies to develop drugs to treat smaller patient populations. In the U.S., ODD entitles a company to seven years of marketing exclusivity for its drug upon regulatory approval. In addition, ODD permits a company to apply for: (1) grant funding from the U.S. government to defray costs of clinical trial expenses, (2) tax credits for clinical research expenses and (3) exemption from the FDA's prescription drug application fee. Over the past several years, there has been a surge in rare disease activity due in part to the efforts of advocacy groups, the media, legislation and large pharmaceutical interest. Yet, orphan diseases continue to represent a significant unmet medical need with fewer than 500 drug approvals for over 7,500 rare diseases; clearly demonstrating the

necessity for innovation in the development of therapeutics to treat orphan diseases. Our lead effort is the clinical development of CEQ508 to treat FAP, a rare disease for which CEQ508 received FDA ODD in 2010. Currently, there is no approved therapeutic for the treatment of FAP. In April 2012, we announced the completion of dosing for Cohort 2 in the Dose Escalation Phase of the START-FAP (Safety and Tolerability of An RNAi Therapeutic in FAP) Phase 1b/2a clinical trial. Based on our financial situation and the stability of existing clinical trial material, we have decided to take advantage of this break in the clinical program to optimize the manufacturing process and produce new clinical trial material. We expect to dose Cohort 3 in the fourth quarter of 2015. In addition, we expect to advance pre-clinical programs in DM1 and DMD through to human proof-of-concept.

We also seek to establish collaborations and strategic partnerships with pharmaceutical and biotechnology companies to generate revenue through up-front, milestone and royalty payments related to our technology and/or the products that are developed using such technology.

In order to protect our innovations, which encompass a broad platform of both nucleic acid-based therapeutic chemistry and delivery technologies, as well as the drug products that may emerge from that platform, we have aggressively built upon our extensive and enabling intellectual property ("IP") estate worldwide, and plan to continue to do so. As of December 31, 2014, we owned or controlled 148 issued or allowed patents, and approximately 95 pending U.S. and foreign patent applications, to protect our proprietary nucleic acid-based drug discovery capabilities.

We believe we have created a unique industry-leading nucleic acid-based drug discovery platform, which is protected by a strong IP position and validated through: (1) licensing agreements for our SMARTICLES delivery technology with Mirna, ProNAi and MiNA for unique nucleic acid payloads – microRNA mimics, DNA interference oligonucleotides and small-activating RNA, respectively; (2) Mirna and ProNAi's respective clinical experience with SMARTICLES; (3) a licensing agreement with Novartis Institutes for Biomedical Research, Inc. ("Novartis") for our CRN technology; (4) a licensing agreement with Protiva Biotherapeutics, Inc. ("Tekmira"), a wholly-owned subsidiary of Tekmira Pharmaceuticals Corporation, for our Unlocked Nucleobase Analog ("UNA") technology; (5) licensing agreements with two large international companies (i.e., Novartis and Monsanto) for certain chemistry and delivery technologies; and (6) our own FAP Phase 1b/2a clinical trial with the *TransKingdom* RNA™ interference ("*tk*RNAi") platform.

LIQUIDITY

We have sustained recurring losses and negative cash flows from operations. At December 31, 2014, we had an accumulated deficit of $337.8 million ($112.1 million of which has been accumulated since the corporation focused on RNA therapeutics in June 2008), a working capital surplus of $0.6 million, a stockholders' deficit of $4.4 million and $1.8 million in cash. We have been funded through a combination of licensing payments and debt and equity offerings. As a result of our financial condition during the period between June 2012 and March 2014, substantially all of our research and development ("R&D") activities were placed on hold, we exited all of our leased facilities, and all of our employees, other than our chief executive officer ("CEO"), either resigned or were terminated.

We have experienced and continue to experience operating losses and negative cash flows from operations, as well as an ongoing requirement for substantial additional capital investments. We believe that our current cash resources, which include an upfront licensing fee received from MiNA in January 2015, will enable us to fund our intended operations through July 2015.

The volatility in our stock price, as well as market conditions in general, could make it difficult for us to raise capital on favorable terms, or at all. If we fail to obtain additional capital when required, we may have to modify, delay or abandon some or all of our planned activities, or terminate our operations. These factors, among others, raise substantial doubt about our ability to continue as a going concern. The accompanying consolidated financial statements do not include any adjustments that may result from the outcome of this uncertainty. We are currently pursuing both non-dilutive means of obtaining additional capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining additional capital, primarily through the offering of our equity and debt securities. However, there can be no assurance that we will be successful in such endeavors.

CURRENT OPERATIONS

With the advancement of a clinical pipeline focused on orphan diseases, we expect to build our operations with limited internal resources by capitalizing on external consultants and contract research organizations. To date, we have engaged consultants with the necessary clinical trial, finance, medical, regulatory, and technical expertise to restart our FAP clinical trial and advance our preclinical efforts. Internal research activities and laboratory spending will be limited to supporting the FAP, DM1 and DMD clinical and pre-clinical efforts. Expansion of the research team will be based on requirements that are driven by the establishment of collaboration and strategic partnerships with pharmaceutical and biotechnology companies.

NUCLEIC ACID-BASED THERAPEUTICS

Overview

Nucleic acid-based therapeutics typically target two types of RNA — coding RNA and non-coding RNA. The targeting of coding RNA is usually associated with inhibition, or the down-regulation, of a specific mRNA via RNAi or mRNA translational inhibition, i.e. a single therapeutic inhibiting the protein expression of a single gene. The targeting of non-coding RNA is usually associated with the modulation (up or down) of a regulatory RNA via miRNA replacement therapy or miRNA inhibition, i.e. a single therapeutic repressing/de-repressing the expression of multiple genes (and thus proteins). The Nobel Prize winning discovery of RNAi in 1998 led not only to its widespread use in the research of biological mechanisms and target validation but also to its application in down-regulating the expression of disease-causing proteins. In this case, the RNAi-based therapeutic, typically a double-stranded siRNA, acts through a naturally occurring process within cells that has the effect of reducing levels of mRNA required for the production of proteins. RNAi enables the targeting of disease at a genetic level and thus is highly specific to particular disease-causing proteins. Like RNAi-based therapeutics, certain single stranded anti-sense oligonucleotides ("ASO") can also interact with mRNA by inhibiting translation (commonly referred to as mRNA translational inhibition) and likewise are highly specific to a disease-causing protein. On the other hand, miRNAs are small non-coding RNAs that are important in both gene regulation and protein translation. miRNAs exert their biological effect upstream of the RNAi pathway and can ultimately influence the RNAi process. Similar to a siRNA or ASO, a miRNA mimic, which increases the level of a miRNA in the cell, can inhibit protein expression. However, unlike a siRNA or translational inhibitor that targets just one gene, a miRNA mimic can simultaneously repress the expression of multiple proteins associated with the genes controlled by that miRNA target. miRNA antagonists (or antagomirs), which bind to the natural miRNA in the cell and prevents the activity of that miRNA, can allow the simultaneous "de-repression" of multiple proteins associated with the genes under control of a single miRNA target. The term de-repression is used to describe the biological process, i.e. the binding of a naturally occurring miRNA by an antagomir causes the miRNA to forego its normal activity in repressing/inhibiting protein expression. In other words, the antagomir removes the brakes a miRNA applies to protein expression resulting in increased protein expression. The overall result of an antagomir and miRNA inhibition is an increase in protein expression downstream of the target miRNA. This type of nucleic acid-based therapeutic sets itself apart not only from other nucleic acid-based therapeutics (i.e. siRNA, ASO mRNA translational inhibitors and miRNA mimics), but also from the majority of small molecules and monoclonal antibodies in that it is one of the few mechanisms of action that can cause an increase in protein expression. In summary, nucleic acid-based therapeutics target genes to either prevent the expression of disease causing proteins or to increase protein expression where the absence of the protein contributes to a disease state.

Although nucleic acid-based therapeutics are being developed for a number of diseases in therapeutic areas including cardiovascular, inflammation, and oncology, perhaps the greatest single opportunity for such therapeutics is in orphan diseases. Nucleic acid-based therapeutics are being advanced in indications characterized by "undruggable" targets; that is targets that cannot be modulated by small molecule or monoclonal antibodies. Therapeutic targets to treat rare and orphan diseases are typically "undruggable" targets. Within the biotechnology and pharmaceutical sectors, nucleic acid-based therapeutics are being developed for over a dozen rare and orphan diseases including: Alport Syndrome, Amyotrophic Lateral Sclerosis, Cystic Fibrosis, Duchenne Muscular Dystrophy, Friedreich's Ataxia, Hemophilia, Hepatic

Porphyrias, Hereditary Angioedema, Homozygous Familial Hypercholesterolemia, Huntington's Disease, Primary Hyperoxaluria (Type I), Myotonic Dystrophy (Type 1), Sickle Cell Disease, Spinal Muscular Atrophy and Transthyretin Familial Amyloid Polyneuropathy. Various nucleic acid-based compounds are in either preclinical or clinical development for the above diseases and include both single- and double-stranded constructs such as: siRNA, miRNA mimics, antagomirs, and ASO utilizing various mechanisms of action such as: RNAi, mRNA translational inhibition, exon skipping, miRNA replacement, miRNA inhibition, and steric blocking. We believe a company that has the capability to develop both single- and double-stranded constructs with sufficient breadth of delivery technologies to get those constructs to the proper cellular targets can capitalize on the specific strength of various nucleic acid mechanisms of action thus creating the greatest chance for clinical success. We believe this multi-faceted approach is particularly applicable for rare and orphan disease indications. Such a capability has the possibility to significantly reduce the risks of failure associated with: (1) off-the-shelf chemistry and/or delivery, (2) one-off proprietary chemistry and/or delivery technologies or (3) mechanism of action.

In 2010, we executed on a strategy to consolidate key intellectual property and technologies necessary to create a broad nucleic acid drug discovery platform with the capability to develop both single- and double-stranded constructs and to deliver those constructs to the proper cellular targets. Besides a key chemistry — CRN — which provides us the freedom to develop single-stranded constructs, we acquired two additional delivery technologies providing us: (1) an ability to deliver oligonucleotides via oral administration to treat gastro-intestinal disorders and (2) a significant expansion of our lipid-based delivery capability. With these acquisitions and the further development and advancement of those technologies from 2010 to the present, we feel we have established the broadest nucleic acid drug discovery platform in the sector and validated that platform through the following partnerships and licensing transactions: (1) ProNAi licensing SMARTICLES for systemic administration of a DNAi oligonucleotide to treat recurrent and relapsed non-Hodgkin's Lymphoma — currently in Phase 2 human testing; (2) Mirna licensing SMARTICLES for systemic administration of a miRNA mimic to treat unresectable primary liver cancer or solid cancers with liver involvement — currently in Phase 1 human testing; (3) Novartis licensing our CRN technology in connection with the development of both single and double-stranded oligonucleotide therapeutics; (4) Tekmira licensing our UNA technology in connection with the development of siRNAs utilizing RNAi for the down-regulation of gene expression; (5) Monsanto licensing certain of our delivery and chemistry technologies for agricultural applications; and (6) MiNA licensing SMARTICLES for systemic administration of a small activating RNA to treat unresectable primary liver cancer or solid cancers with liver involvement and liver diseases. Further, between the clinical programs of ProNAi and Mirna with SMARTICLES and our own clinical program using the *tk*RNAi technology, we believe we are the only company in the space whose delivery technologies are being used, in human clinical trials, to deliver three different types of nucleic acid compounds via two modes of administration: (1) oral administration of a double-stranded shRNA; (2) systemic administration of a double-stranded miRNA mimic and (3) systemic administration of a single-stranded DNA decoy. We believe every other company's technologies, in clinical development, are limited to a single mode of administration (only intravenous, intramuscular and sub-cutaneous) and a single nucleic acid payload.

Together with our existing and potential future partners, we intend to continue to build our understanding of the unique chemistry and delivery technologies we have assembled in order to effectively develop novel nucleic acid-based therapeutics for the treatment of human disease while minimizing the risk of failure. We will focus our development efforts toward certain orphan disease indications and collaborate with both biotechnology and pharmaceutical companies in the development of other orphan and non-orphan diseases.

Nucleic Acid-Based Drug Discovery Platform

Through the advancement of our FAP clinical program and pre-clinical programs in DM1 and DMD, we plan to continue to make improvements in both areas crucial to the development of nucleic acid-based therapeutics: constructs and delivery technologies. Although each area is equally important to the development of an effective therapeutic, the scientific challenges of delivery are one of the most significant obstacles to the broad use of nucleic acid-based therapeutics in the treatment of human disease including orphan diseases.

UsiRNA Constructs. Our UsiRNAs, which are siRNA with substitution of UNA bases in place of RNA bases in key regions of the double-stranded construct, have shown important advantages in terms of efficacy and safety, when compared to standard siRNA molecules and modifications. UsiRNAs are highly active in rodent-based disease models, non-disease rodent models, and non-human primates. UsiRNAs function via RNAi to cut the targeted mRNA into two pieces in such a manner that the target mRNA can no longer function and thereby decreasing the production of the protein associated with the gene target. In the case of bladder cancer, liver cancer and malignant ascites, the UsiRNAs decrease tumor growth in the respective rodent disease model. UsiRNAs have demonstrated a lower potential for cytokine induction and provide resistance to nuclease degradation, two effects that are often prominent with standard siRNAs. Most importantly, substitution with UNA at specific sites greatly increases the specificity for RNAi and improves their profile for therapeutic use. Substitution in the passenger strand can eliminate the ability of this strand to act in the RNAi pathway and, thereby, the potential for unwanted effects on other targets or competition with guide strand activity by loading into the intracellular RNAi machinery. Substitution of UNA within the guide strand can eliminate miRNA-like effects that occur with standard siRNA. This miRNA-like off-target activity cannot often be addressed by bioinformatics and can result in severe loss of activity if addressed with standard chemical modification of RNA. Overall these data indicate that not only do UsiRNAs maintain potent RNAi activity, they may also have superior drug like properties, through a combination of greater target specificity, improved safety and lower total dosing, when compared to typical siRNA-based compounds resulting in more effective protein down-regulation.

Conformationally Restricted Nucleotides (CRN). CRNs are novel nucleotide analogs in which the flexible ribose sugar is locked into a rigid conformation by a small chemical linker. By restricting the flexibility of the ribose ring, CRNs can impart a helix-type structure typically found in naturally occurring RNA. For single stranded oligonucleotide therapeutics, the impact of CRN substitution dramatically increases the therapeutics' affinity for the target mRNA or miRNA while imparting significant resistance to nuclease degradation. Additionally, CRNs can significantly improve the thermal stability of double-stranded constructs, such as siRNAs. We reported *in vivo* dose-dependent efficacy with a CRN-substituted antagomir against miRNA-122 ("miR-122"). The efficacy in a rodent model was demonstrated by up to a 5-fold increase in AldoA, a well-known downstream gene regulated by miR-122. In addition, downstream targets GYSI and SLC7A1 were also elevated. The increase in these downstream gene targets was achieved by the sequestration of miR-122 by a high affinity CRN-substituted antagomir. In addition, the CRN-substituted antagomir, which was dosed for three consecutive days at up to 50 mg/kg/day, was extremely well tolerated in rodents as evidenced by normal serum chemistry parameters and no body weight changes. CRNs are critical to our ability to develop single-stranded oligonucleotides.

Delivery. We have two liposomal-based delivery platforms. The first platform, SMARTICLES, defines a novel class of liposomes that are fully charge-reversible particles allowing delivery of active substance (siRNA, single-stranded oligonucleotides, etc.) inside a cell either by local or systemic administration. SMARTICLES-based liposomes are designed to ensure stable passage through the bloodstream and the release of nucleic acid payloads within the target cell where they can exert their therapeutic effect by engaging either the RNAi pathway or directly with mRNA. To date, SMARTICLES-delivered nucleic acid drug candidates, which have been administered to approximately 100 patients, have demonstrated: (1) delivery to tumor in Phase 1 and 2 clinical trials; (2) statistically significant, dose-dependent, and specific knockdown of a gene target in a Phase 1 clinical trial; (3) single agent anti-tumor activity in patients with recurrent or refractory non-Hodgkin's lymphoma (NHL) in a Phase 2 clinical trial; and (4) anti-tumor efficacy with both single- and double-stranded oligonucleotides in rodent models.

ProNAi's clinical compound, PNT2258, is a first-in-class, 24-base, single-stranded, chemically-unmodified DNA oligonucleotide drug targeting BCL2. PNT2258 exhibits single agent anti-tumor activity in patients with recurrent or refractory NHL. Eighty-two percent of patients had tumor shrinkage when receiving single-agent therapy with PNT2258. To date, overall response rate in patients with follicular lymphoma is 40 percent and in patients with diffuse large B-cell lymphoma overall response is 50 percent. PNT2258 is safe at a dose of 120 mg/m2 administered intravenously for 2 to 3 hours on days 1 through 5 of a 21-day schedule. No tumor lysis syndrome or major organ toxicities were observed. No occurrences of elevated liver enzymes, hyperkalemia, hyperphosphatemia, hypocalcemia, renal failure/ dysfunction, or infections were noted nor were any Grade 4 toxicities. PNT2258 drug exposure levels (AUC)

exceeded by at least four-fold that required for anti-tumor activity in xenograft studies of human tumors, consistent with the Phase 1 trial. In addition, as recently reported at the Annual Meeting of the American Society of Hematology in December 2014, investigators for the study concluded that: (1) PNT2258 treatment results in significant, durable responses in patients with relapsed or refractory non-Hodgkin's Lymphoma (r/r NHL); (2) eleven of the thirteen (11/13) patients treated achieved clinical benefit, with ongoing Progression Free Survival (PFS) extending to 18 months and beyond; (3) PNT2258 is demonstrably active in patients with diffuse large B-cell lymphoma (DLBCL) — all four of the patients (4/4) with DLBCL responded to PNT2258, with three patients achieving complete responses (CR) and one patient achieving a partial response (PR), with durations extending to greater than 500 days; (4) durable and clinically meaningful CR's and PR's were achieved in subjects with aggressive disease, such as Richter's transformation and Burkitt's-like DLBCL; (5) noteworthy durable CR's and PR's were also observed in subjects with advanced stage follicular lymphoma (FL); and (6) PNT2258 therapy is safe and very well-tolerated with dosing periods up to and exceeding 18 months. In January 2015, ProNAi reported that the first patient with relapsed or refractory diffuse large B-cell lymphoma had enrolled in the "Wolverine" Phase 2 study and had been treated with PNT2258.

Mirna's clinical compound, MRX34, is a double-stranded miRNA "mimic" of the naturally occurring tumor suppressor miR-34, which inhibits cell cycle progression and induces cancer cell death. The Phase 1 MRX34 study, for the treatment of patients with unresectable primary liver cancer or solid cancers with liver involvement, is designed with an initial dose-escalation phase of approximately 30 patients, followed by an expansion phase of approximately 18 additional patients after the recommended Phase 2 dose has been identified. MRX34 is administered intravenously twice a week for three weeks with one week off, during 28-day cycles, until disease progression or intolerance. Interim safety data from the multicenter, open-label Phase 1 clinical trial of MRX34 showed that MRX34 has a manageable safety profile with only one incident of a dose-limiting toxicity observed to date. In addition, as recently reported at the European Organisation for Research and Treatment of Cancer in November 2014, data show that MRX34 has a manageable safety profile in patients with advanced primary liver cancer (hepatocellular carcinoma), other solid tumors with liver metastasis, and hematological malignancies. A maximum tolerated dose (MTD) was established at 110 mg/m2 for MRX34 administered twice weekly for three weeks followed by one week off. And while this Phase 1 study is intended to investigate safety, tolerability, pharmacokinetics, and dosing regimens, treatment with MRX34 has provided early signals of clinical activity in advanced cancer patients with primary liver, neuroendocrine, colorectal and small cell lung cancers, as well as diffuse large B-cell lymphoma.

We believe the combined clinical delivery experiences of ProNAi and Mirna are impressive and that SMARTICLES is a potential product differentiator in the further development of our orphan disease clinical pipeline.

The second platform utilizes amino-based liposomal delivery technology and incorporates a novel and proprietary molecule we call DiLA2 (Di-Alkylated Amino Acid). Our scientists designed this molecule based on amino acid (e.g., peptide/protein-based) chemistry. A DiLA2-based liposome has several potential advantages over other liposomes, such as: (1) a structure that may enable safe and natural metabolism by the body; (2) the ability to adjust liposome size, shape, and circulation time, to influence bio-distribution; and (3) the ability to attach molecules that can influence other delivery-related attributes such as cell specific targeting and cellular uptake. Our formulations for delivery of UsiRNAs, using different members of the DiLA2 family, have demonstrated safe and effective delivery in rodents with metabolic targets (e.g., ApoB) and in cancer models using both local and systemic routes of administration. Safe and effective delivery with DiLA2-based formulations has also been achieved in non-human primates.

In addition to our liposomal-based delivery platforms, we have used peptides for both the formation of stable siRNA nanoparticles as well as targeting moieties for siRNA molecules. This research has included: (1) the use of peptide technology to "condense" siRNAs into compact and potent nanoparticles; (2) screening of our proprietary Trp Cage phage display library for targeting peptides; and (3) internal discovery and development of peptides and other compounds recognized as having cellular targeting or cellular uptake properties. The goal in the use of such technologies is to minimize the amount of final drug required to produce therapeutic response by increasing the potency of the drug product as well as by directing more of the final drug product to the intended site of action.

TransKingdom RNA™ interference (tkRNAi) platform. *tk*RNAi is a broad-reaching platform that can be used to develop highly specific drug products for a diverse set of diseases. The *tk*RNAi platform involves the modification of bacteria to deliver short-hairpin RNA ("shRNA") to cells of the gastrointestinal tract. A significant advantage of the *tk*RNAi platform is oral (by mouth) delivery making this platform extremely patient friendly while harnessing the full potential of the RNAi process. The *tk*RNAi platform has demonstrated *in vivo* mRNA down-regulation of both inflammatory and cancer targets, thus providing a unique opportunity to develop RNAi-based therapeutics against inflammation and oncology diseases such as Crohn's Disease, ulcerative colitis and colon cancer. For our own clinical pipeline, we have used the *tk*RNAi platform to discover and develop CEQ508 for the treatment of FAP.

Clinical Program. CEQ508 is being developed for the treatment of FAP, a hereditary condition that occurs in approximately 1:10,000 persons worldwide. FAP is caused by mutations in the adenomatous polyposis coli gene. As a result of these mutations, epithelial cells lining the intestinal tract have increased levels of the protein ß-catenin, which in turn results in uncontrolled cell growth. Proliferation (uncontrolled cell growth) of the epithelial cells results in the formation of hundreds to thousands of non-cancerous growths (polyps) throughout the large intestine. By age 35, 95% of individuals with FAP have developed polyps and most will experience adverse effects including increased risk of bleeding and the potential for anemia. In more severe cases, obstruction of the intestines, abdominal pain, and severe bouts of diarrhea or constipation can occur. FAP patients are also at an increased risk of various cancers but specifically colon cancer. If measures are not taken to prevent the formation of polyps or to remove the polyps, nearly 100% of FAP patients will develop colon cancer. Currently, there is no approved therapeutic for the treatment of FAP. For many patients, complete colectomy (surgical removal of the entire large intestine), usually performed in the late teenage years or early twenties, is the only viable option for treatment. However, surgical intervention is not curative as the risk of polyps forming in the remaining portions of the intestinal tract and in the small intestine continues after colectomy. Most people with the genetic condition are in registries maintained in clinics and state institutions. Based on limited prevalence data, we believe the U.S. and European FAP patient population are each approximately 30,000 patients, with another 40,000 patients in Asia.

CEQ508 is the first drug candidate in a novel class of therapeutic agents utilizing the tkRNAi platform and the first orally administered RNAi-based therapeutic in clinical development. CEQ508 comprises attenuated bacteria that are engineered to enter into dysplastic tissue and release a payload of shRNA, a mediator in the RNAi pathway. The shRNA targets the mRNA of ß-catenin, which is known to be dysregulated in classical FAP. CEQ508 is being developed as an orally administered treatment to reduce the levels of ß-catenin protein in the epithelial cells of the small and large intestine. Upon enrollment in the Phase 1b/2a clinical trial, patients are placed in one of four dose-escalating cohorts. Following completion of the dose escalation phase, the trial plan calls for a stable-dose phase in which patients will receive the highest safe dose. Under the trial protocol, CEQ508 is administered daily in an oral suspension for 28 consecutive days. In April 2012, we announced the completion of dosing for Cohort 2 in the Dose Escalation Phase of the START-FAP (Safety and Tolerability of An RNAi Therapeutic in Familial Adenomatous Polyposis) clinical trial of CEQ508. We did not proceed with the dosing of Cohort 3 patients due to our financial situation in 2012. Based on our financial situation and the stability of existing clinical trial material, we have decided to take advantage of this break in the clinical program to optimize the manufacturing process and produce new clinical trial material. We expect to dose Cohort 3 in the fourth quarter of 2015.

The FDA granted orphan drug designation to CEQ508 for the treatment of FAP. Orphan drug designation entitles us to seven years of marketing exclusivity for CEQ508 for the treatment of FAP upon regulatory approval, as well as the opportunity to apply for: (1) grant funding from the U.S. government to defray costs of clinical trial expenses, (2) tax credits for clinical research expenses and (3) exemption from the FDA's prescription drug application fee.

Pre-Clinical Programs. With the breadth of our nucleic acid-based drug discovery platform, we believe we are in a unique position to develop both single- and double-stranded clinical candidates to treat various neuromuscular disorders and dystrophies within the orphan drug space. Neuromuscular disorders affect the nerves that control voluntary muscles, such as those that control the arms and legs. Nerve cells, also called neurons, send messages that control these muscles. When the neurons become unhealthy or die,

communication between the nervous system and muscles breaks down. As a result, muscles weaken and waste away. Likewise, dystrophies are progressive degenerative disorders affecting skeletal muscles. In both cases, the diseases can often affect other organ systems such as the heart and central nervous system. Many neuromuscular diseases and almost all dystrophies are genetic, which means there is a mutation in the genes which in many cases is passed from parent to child. Although a cure for these disorders may present itself in the future, the goal of our drug development effort will be to improve symptoms, increase mobility and increase the individual's lifespan. We have chosen to pursue clinical efforts in two orphan disease indications — DM1 and DMD.

Myotonic dystrophy is one of a classification of inherited disorders named muscular dystrophies. It is the most common form of muscular dystrophy that begins in adulthood and is characterized by progressive muscle wasting and weakness. Individuals with this disorder often have prolonged muscle contractions (myotonia) and are not able to relax certain muscles after use. There are two major types of myotonic dystrophy: type 1 and type 2. Signs and symptoms overlap, although type 2 tends to be milder than type 1. Myotonic dystrophy affects at least 1:8,000 people worldwide. The prevalence of the two types of myotonic dystrophy varies among different geographic and ethnic populations. In most populations, type 1 appears to be more common than type 2.

Duchenne muscular dystrophy is a rare muscle disorder affecting approximately 1:3,500 male births worldwide. Like myotonic dystrophy, DMD is also characterized by muscle wasting and weakness starting first in the pelvic area followed by shoulder muscles. DMD is typically diagnosed between three and six years of age. As the disease progresses, muscle weakness and wasting spreads to the trunk and forearms and gradually progresses to involve additional muscles of the body. The disease is progressive and most affected individuals require a wheelchair by the teenage years. Serious life-threatening complications may ultimately develop including disease of the heart muscle and respiratory difficulties.

We believe our delivery technologies, combined with our CRN chemistry, will permit us to develop best-in-class miRNA antagonists and mimics as well as ASO targeting translational inhibition and exon-skipping ASOs targeting cytosine-uracil-guanine (CUG) repeats in affected mRNA for the treatment of DM1 and DMD. Further, our ability to work with all of these modalities is potentially critically important to the treatment of these multi-system diseases, as the disease is not limited to skeletal muscle but also affects the heart and central nervous system. While current technologies are limited by either a single-stranded or a double-stranded approach, we can pursue whichever nucleic acid modality most effectively treats each diseases.

Partnering and Licensing Agreements

MiNA — On December 17, 2014, we entered into a license agreement with MiNA regarding the development and commercialization of small activating RNA-based therapeutics utilizing MiNA's proprietary oligonucleotides and our SMARTICLES nucleic acid delivery technology. MiNA will have full responsibility for the development and commercialization of any products arising under the agreement. We received an upfront fee of $0.5 million in January 2015. We could receive up to an additional $49 million in clinical and commercialization milestone payments, as well as royalties on sales, based on the successful development of MiNA's potential product candidates.

Rosetta — On April 1, 2014, we entered into a strategic alliance with Rosetta to identify and develop miRNA-based products designed to diagnose and treat various neuromuscular diseases and dystrophies. Under the terms of the alliance, Rosetta will apply its industry leading miRNA discovery expertise for the identification of miRNAs involved in the various dystrophy diseases. If the miRNA is determined to be correlative to the disease, Rosetta may further develop the miRNA into a diagnostic for patient identification and stratification. If the miRNA is determined to be involved in the disease pathology and represents a potential therapeutic target, Marina may develop the resulting miRNA-based therapeutic for clinical development. The alliance is exclusive as it relates to neuromuscular diseases and dystrophies, with both companies free to develop and collaborate outside this field both during and after the terms of the alliance.

Arcturus — On August 9, 2013, we and Arcturus entered into a Patent Assignment and License Agreement, pursuant to which we assigned our UNA technology for the development of RNAi therapeutics to Arcturus. In consideration for entering into the agreement, we received a one-time payment

in full of $0.8 million for the Patent Assignment and License Agreement and transferred the Protiva Biotherapeutics, Inc. (i.e. Tekmira) and Ribotask AsP license agreements to Arcturus. In addition, under the terms of the agreement, we retained a worldwide, fully-paid, royalty free, non-exclusive license to the UNA technology equal to the non-exclusive rights licensed by Tekmira and F. Hoffmann-La Roche Inc. and by F. Hoffmann-La Roche Ltd. (rights owned now by Arrowhead Research, Inc.).

Tekmira — On November 28, 2012, we entered into a License Agreement with Tekmira, whereby we provided Tekmira a worldwide, non-exclusive license to our UNA technology for the development of RNAi therapeutics. Tekmira will have full responsibility for the development and commercialization of any products arising under the License Agreement. In consideration for entering into the agreement, we received an upfront payment of $0.3 million, and are eligible to receive milestone payments upon the satisfaction of certain clinical and regulatory milestone events and royalty payments in the low single digit percentages on products developed by Tekmira that use UNA technology. Tekmira may terminate the agreement for convenience in its entirety, or in respect of any particular country or countries, by giving 90 days prior written notice to us, provided that no such termination shall be effective sooner than August 28, 2013. Either party may terminate the agreement immediately upon the occurrence of certain bankruptcy events involving the other party, or, following the expiration of a 120 day cure period (60 days in the event of a default of a payment obligation by Tekmira), upon the occurrence of a material breach of the agreement by the other party. With the purchase of the UNA asset by Arcturus in August 2013, the Tekmira License Agreement transferred to Arcturus.

Novartis — On August 2, 2012, we and Novartis entered into a worldwide, non-exclusive License Agreement for our CRN technology for the development of both single and double-stranded oligonucleotide therapeutics. We received a $1.0 million one-time payment for the non-exclusive license. In addition, in March 2009, we entered into an agreement with Novartis pursuant to which we granted to Novartis a worldwide, non-exclusive, irrevocable, perpetual, royalty-free, fully paid-up license, with the right to grant sublicenses, to our DiLA2-based siRNA delivery platform in consideration of a one-time, non-refundable fee of $7.25 million, which was recognized as license fee revenue in 2009. Novartis may terminate this agreement immediately upon written notice to us.

Avecia — On May 18, 2012, we and Avecia entered into a strategic alliance pursuant to which Avecia will have exclusive rights to develop, supply and commercialize certain oligonucleotide constructs using our CRN chemistry and, in return, we will receive single digit percentage royalties from the sale of CRN-based oligonucleotide reagents, as well as a robust supply of cGMP material for us and our partners' pre-clinical, clinical and commercialization needs.

Monsanto — On May 3, 2012, we and Monsanto entered into a worldwide exclusive Intellectual Property License Agreement for our delivery and chemistry technologies. On May 3, 2012, we and Monsanto also entered into a Security Agreement pursuant to which we granted to Monsanto a security interest in that portion of our intellectual property that is the subject of the License Agreement in order to secure the performance of our obligations under the License Agreement. Under the terms of the license agreement, we received $1.5 million in initiation fees, and may receive royalties on product sales in the low single digit percentages. Monsanto may terminate the License Agreement at any time in whole or as to any rights granted thereunder by giving prior written notice thereof to us, with termination becoming effective three months from the date of the notice.

ProNAi — On March 13, 2012, we entered into an Exclusive License Agreement with ProNAi regarding the development and commercialization of ProNAi's proprietary DNAi-based therapeutics utilizing SMARTICLES. The License Agreement provides that ProNAi will have full responsibility for the development and commercialization of any products arising under the License Agreement. Under terms of the License Agreement, we could receive up to $14 million for each gene target in upfront, clinical and commercialization milestone payments, as well as royalties in the single digit percentages on sales, with ProNAi having the option to select any number of gene targets. Either party may terminate the License Agreement upon the occurrence of a default by the other party (subject to standard cure periods), or upon certain events involving the bankruptcy or insolvency of the other party. ProNAi may also terminate the License Agreement without cause upon ninety (90) days' prior written notice to us.

Mirna — On December 22, 2011, we entered into a License Agreement with Mirna regarding the development and commercialization of miRNA-based therapeutics utilizing Mirna's proprietary miRNAs and SMARTICLES. The License Agreement provides that Mirna will have full responsibility for the development and commercialization of any products arising under the License Agreement and that we will support pre-clinical and process development efforts. Under terms of the License Agreement, we could receive up to $63 million in upfront, clinical and commercialization milestone payments, as well as royalties in the low single digit percentages on sales, based on the successful outcome of the collaboration. Either party may terminate the License Agreement upon the occurrence of a default by the other party. Mirna may also terminate the License Agreement without cause upon 60 days prior written notice to us. We and Mirna entered into an amendment of this agreement in December 2013, pursuant to which Mirna made certain pre-payments to us and now has additional rights to its lead program, MRX34. Further under the amendment, Mirna optioned exclusivity on several additional miRNA targets.

Novosom — On July 27, 2010, we entered into an agreement pursuant to which we acquired the intellectual property of Novosom AG ("Novosom") of Halle, Germany for SMARTICLES, which significantly broadens the number of approaches we may take for systemic and local delivery of our proprietary UNA and CRN-based oligonucleotide therapeutics. We issued an aggregate of .014 million shares of our common stock to Novosom as consideration for the acquired assets. The shares had a value equal to approximately $3.8 million, which was recorded as research and development expense. As additional consideration for the acquired assets, we will pay to Novosom an amount equal to 30% of the value of each upfront (or combined) payment actually received by us in respect of the license of liposomal-based delivery technology or related product or disposition of the liposomal-based delivery technology by us, up to $3.3 million, which amount will be paid in shares of our common stock, or a combination of cash and shares of our common stock, at our discretion. To date we have issued an aggregate of 1.5 million shares of common stock to Novosom representing additional consideration of $0.8 million as a result of the license agreements and amendments to such license agreements that we entered into with our partners.

Valeant Pharmaceuticals — On March 23, 2010, we acquired intellectual property related to our CRN chemistry from Valeant Pharmaceuticals North America ("Valeant") in consideration of payment of a non-refundable licensing fee of $0.5 million which was included in research and development expense in 2010. Subject to meeting certain milestones triggering the obligation to make any such payments, we may be obligated to make a product development milestone payment of $5.0 million and $2.0 million within 180 days of FDA approval of a New Drug Application for our first and second CRN related product, respectively. To date, we had not made any such milestone payments but have milestone obligations of $0.13 million based on CRN licenses to date. Valeant is entitled to receive earn-outs based upon a percentage in the low single digits of future commercial sales and earn-outs based upon a percentage in the low double digits of future revenue from sublicensing. Under the agreement we are required to use commercially reasonable efforts to develop and commercialize at least one covered product. If we have not made earn-out payments of at least $5.0 million prior to March 2016, we are required to pay Valeant an annual amount equal to $50,000 per assigned patent which shall be creditable against other payment obligations. The term of our financial obligations under the agreement shall end, on a country-by-country basis, when there no longer exists any valid claim in such country. We may terminate the agreement upon 30 day notice, or upon 10 day notice in the event of an adverse results from clinical studies. Upon termination, we are obligated to make all payments accrued as of the effective date of such termination but shall have no future payment obligations.

University of Helsinki — On June 27, 2008, we entered into a collaboration agreement with Dr. Pirjo Laakkonen and the Biomedicum Helsinki. The goal of the work involves our patented phage display library, the Trp Cage library, for the identification of peptides to target particular tissues or organs for a given disease. In December 2009, we received a patent allowance in the U.S. covering a targeting peptide for preferential delivery to lung tissues that was identified by us using the Trp Cage Library. We believe the Trp Cage library will be a source of additional peptides for evaluation in our delivery programs, and we will have a strong IP position for these peptides and their use. This agreement terminated by its terms in June 2012. Under this agreement, we may be obligated to make product development milestone payments of up to €275,000 in the aggregate for each product developed under this research agreement if certain milestones are met. To date, we have not made, and are not under any current obligation to make, any such

milestone payments, as the conditions that would trigger any such milestone payment obligations have not been satisfied. In addition, upon the first commercial sale of a product, we are required to pay an advance of 0.25€ million (based on currency conversion rates as of July 14, 2014 this equals approximately $0.34 million) against which future royalties will be credited. The percentage royalty payment required to be made by us to the University of Helsinki is a percentage of gross revenues derived from work performed under the Helsinki Agreement in the low single digits.

PROPRIETARY RIGHTS AND INTELLECTUAL PROPERTY

We rely primarily on patents and contractual obligations with employees and third parties to protect our proprietary rights. We have sought, and intend to continue to seek, appropriate patent protection for important and strategic components of our proprietary technologies by filing patent applications in the U.S. and certain foreign countries. There can be no assurance that any of our patents will guarantee protection or market exclusivity for our products and product candidates. We also use license agreements both to access external technologies and to convey certain intellectual property rights to others. Our financial success will be dependent in part on our ability to obtain commercially valuable patent claims and to protect our intellectual property rights and to operate without infringing upon the proprietary rights of others. As of December 31, 2014, we owned or controlled 148 issued or allowed patents, and approximately 95 pending U.S. and foreign patent applications, to protect our proprietary nucleic acid-based drug discovery capabilities. Our patent portfolio, as of December 31, 2014, consisted of the following:

Estimated Expiration	No. of Issued/Allowed Patents	Jurisdiction
2019	7 total	U.S.
2020	1 total	Germany
	2 total	U.S.
2021	1 total	U.S.
2022	1 each	Belgium, Brazil, Ireland, Italy, Spain
	2 each	Australia, Canada, China, Japan, Singapore
	3 each	Germany, Netherlands, Switzerland, U.K., Austria, France
	6 total	U.S.
2023	1 each	Austria, France, Germany, Netherlands, Switzerland, U.K.
	2 total	U.S.
2024	1 total	China
2025	1 each	Australia, Hong Kong, Ireland, Italy, Korea, Spain, Switzerland
	2 total	Japan
	3 each	Canada, France, Germany, U.K.
	6 total	U.S.
2026	1 each	Australia, China, Hong Kong, Mexico, Japan, U.S., Canada
2027	1 each	JP, France, Germany, U.K., Switzerland, Netherlands
2027	5 total	U.S.

Estimated Expiration	No. of Issued/Allowed Patents	Jurisdiction
2028	1 total	Australia
	2 each	New Zealand, China, France, Germany, U.K., Switzerland, Netherlands, Spain, Italy, Ireland
	4 total	U.S.
2029	1 each	Italy, Spain, Switzerland, China
	2 each	France, Germany, U.K.
2030	1 each	South Africa, France, Germany, U.K., Switzerland, Ireland, Italy, Spain, Netherlands

The patents listed in the table above will expire generally between 2019 and 2030, subject to any potential patent term extensions and/or supplemental protection certificates that would extend the terms of the patents in countries where such extensions may become available.

COMPETITION

There are a number of small, mid-sized and large biotechnology companies that compete with us. Universities and public and private research institutions are also potential competitors. Our competition is typically focused on a single nucleic acid mechanism of action, i.e. RNAi or mRNA translational inhibition or exon skipping or miRNA replacement therapy. Some of these companies only have a proprietary position around either chemistry or delivery and in fewer cases, their proprietary position arises from their belief that they can patent biology, i.e. miRNA targets. We believe we are the only company in the position of having proprietary chemistry and delivery technologies sufficient to pursue multiple nucleic acid mechanisms of action, i.e. RNAi and mRNA translational inhibition and exon skipping and miRNA replacement therapy. Such single mechanism of action competitors include: Alnylam Pharmaceuticals, Arcturus, Benitec Biopharma, Dicerna Pharmaceuticals, Isis Pharmaceuticals ("Isis"), miRagen Therapeutics, Mirna, PhaseRx Pharmaceuticals, Quark Pharmaceuticals, Regulus Therapeutics, RXi Pharmaceuticals, Sarepta Therapeutics ("Sarepta"), Silence Therapeutics and Tekmira. In 2014, two of our competitors were acquired. Santaris Pharma A/S was acquired by Roche Group for $250 million plus additional contingent payments of up to $200 million based on the achievement of certain predetermined milestones, and Prosensa Holding, N.V. was acquired by BioMarin Pharmaceuticals, Inc. for $680 million plus additional contingent payments of up to $160 million based on drisapersen regulatory approvals in the U.S. and Europe.

Several companies have clinical stage programs with the majority in an orphan disease indication. In particular, Isis has an early stage clinical program in DM1 and Sarepta has a late stage clinical program in DMD.

GOVERNMENT REGULATION

Government authorities in the U.S. and other countries extensively regulate the research, development, testing, manufacture, labeling, promotion, advertising, distribution and marketing, among other things, of drugs and biologic products. All of our foreseeable product candidates (including those for human use that may be developed by our partners based on our licensed technologies) are expected to be regulated as drug products.

In the U.S., the FDA regulates drug products under the Federal Food, Drug and Cosmetic Act (the "FDCA"), and other laws within the Public Health Service Act. Failure to comply with applicable U.S. requirements, both before and after approval, may subject us to administrative and judicial sanctions, such as a delay in approving or refusal by the FDA to approve pending applications, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, and/or criminal prosecutions. Before our drug products are marketed they must be approved by the FDA. The steps required before a novel drug product is approved by the FDA include: (1) pre-clinical laboratory, animal, and formulation tests; (2) submission to the FDA of an Investigational New Drug Application ("IND") for human clinical testing, which must become effective before human clinical trials may begin; (3) adequate and well-controlled clinical trials to establish the safety and effectiveness of the product for each indication for which approval is sought; (4) submission to the FDA of a New Drug Application ("NDA"); (5) satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug product is produced to assess compliance with cGMP and FDA review and finally (6) approval of an NDA.

Pre-clinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies. The results of the pre-clinical tests, together with manufacturing information and analytical data, are submitted to the FDA as part of an IND, which must become effective before human clinical trials may begin. An IND will automatically become effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions, such as the conduct of the trials as outlined in the IND. In such a case, the IND sponsor and the FDA must resolve any outstanding FDA concerns or questions before clinical trials can proceed. There can be no assurance that submission of an IND will result in FDA authorization to commence clinical trials. Once an IND is in effect, each clinical trial to be conducted under the IND must be submitted to the FDA, which may or may not allow the trial to proceed.

Clinical trials involve the administration of the investigational drug to human subjects under the supervision of qualified physician-investigators and healthcare personnel. Clinical trials are typically conducted in three defined phases, but the phases may overlap or be combined. Phase 1 usually involves the initial administration of the investigational drug or biologic product to healthy individuals to evaluate its safety, dosage tolerance and pharmacodynamics. Phase 2 usually involves trials in a limited patient population, with the disease or condition for which the test material is being developed, to evaluate dosage tolerance and appropriate dosage; identify possible adverse side effects and safety risks; and preliminarily evaluate the effectiveness of the drug or biologic for specific indications. Phase 3 trials usually further evaluate effectiveness and test further for safety by administering the drug or biologic candidate in its final form in an expanded patient population. Our product development partners, the FDA, or we may suspend clinical trials, if any, at any time on various grounds, including any situation where we or our partners believe that patients are being exposed to an unacceptable health risk or are obtaining no medical benefit from the test material.

Assuming successful completion of the required clinical testing, the results of the pre-clinical trials and the clinical trials, together with other detailed information, including information on the manufacture and composition of the product, are submitted to the FDA in the form of an NDA requesting approval to market the product for one or more indications. Before approving an application, the FDA will usually inspect the facilities where the product is manufactured, and will not approve the product unless cGMP compliance is satisfactory. If the FDA determines the NDA is not acceptable, the FDA may outline the deficiencies in the NDA and often will request additional information. If the FDA approves the NDA, certain changes to the approved product, such as adding new indications, manufacturing changes or additional labeling claims are subject to further FDA review and approval. The testing and approval process requires substantial time, effort and financial resources, and we cannot be sure that any approval will be granted on a timely basis, if at all.

Under the Orphan Drug Act, the FDA may grant orphan drug designation to a drug intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the U.S. and for which there is no reasonable expectation that the cost of developing and making available in the U.S. a drug for this type of disease or condition will be recovered from sales in the U.S. for that drug. Orphan drug designation must be requested before submitting an NDA. After the FDA grants orphan drug designation, the identity of the

therapeutic agent and its potential orphan use are disclosed publicly by the FDA. If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a full BLA, to market the same drug for the same indication, except in very limited circumstances, for seven years. The FDA granted orphan drug designation to CEQ508 for the treatment of FAP in December 2010.

In addition, regardless of the type of approval, we and our partners are required to comply with a number of FDA requirements both before and after approval. For example, we and our partners are required to report certain adverse reactions and production problems, if any, to the FDA, and to comply with certain requirements concerning advertising and promotion for products. In addition, quality control and manufacturing procedures must continue to conform to cGMP after approval, and the FDA periodically inspects manufacturing facilities to assess compliance with cGMP. Accordingly, manufacturers must continue to expend time, money and effort in all areas of regulatory compliance, including production and quality control to comply with cGMP. In addition, discovery of problems, such as safety problems, may result in changes in labeling or restrictions on a product manufacturer or NDA holder, including removal of the product from the market.

PRODUCT LIABILITY

We currently do not carry product liability insurance as no patients are currently being treated with our products. We will renew our product liability insurance portfolio on the resumption of patient access to our products.

ENVIRONMENTAL COMPLIANCE

Our research and development activities have involved the controlled use of potentially harmful biological materials as well as hazardous materials, chemicals and various radioactive compounds. We are subject to federal, state and local laws and regulations governing the use, storage, handling and disposal of these materials and specific waste products. We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of bio-hazardous materials. The cost of compliance with these laws and regulations could be significant and may adversely affect capital expenditures to the extent we are required to procure expensive capital equipment to meet regulatory requirements. At this time, we are not conducting any R&D activities that require compliance with federal, state or local laws.

EMPLOYEES

With our focus on a rare disease clinical pipeline, we are able to operate our company with minimal full-time employees. As of the date of this report, our CEO is our only full-time employee. We are also utilizing approximately 10 consultants, the majority of whom previously were either employees of or consultants to our company, to support our on-going operations. None of our employees are covered by collective bargaining agreements.

COMPANY INFORMATION

We are a reporting company and are required to file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy these reports, proxy statements and other information 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 or e-mail the SEC at publicinfo@sec.gov for more information on the operation of the public reference room. Our SEC filings are also available at the SEC's website at http://www.sec.gov. Our Internet address is http://www.marinabio.com. There we make available, free of charge, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to those reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC.

ITEM 1A. ***Risk Factors.***

RISKS RELATING TO BEING AN EARLY STAGE DRUG DEVELOPMENT COMPANY

Our cash and other sources of liquidity may only be sufficient to fund our limited operations through July 2015. We will require substantial additional funding to continue our operations beyond that date. If additional capital is not available, we may have to curtail or cease operations, or take other actions that could adversely impact our shareholders.

Our business does not generate the cash necessary to finance our operations. We incurred net losses of $1.6 million in 2013 and $6.5 million in 2014. We will require significant additional capital to:

- fund research and development activities relating to our nucleic acid drug discovery platform and the development of our product candidates, including clinical and pre-clinical trials;
- obtain regulatory approval for our product candidates;
- pursue licensing opportunities for our technologies and product candidates;
- protect our intellectual property;
- attract and retain highly-qualified personnel;
- respond effectively to competitive pressures; and
- acquire complementary businesses or technologies.

Our future capital needs depend on many factors, including:

- the scope, duration and expenditures associated with our research and development;
- continued scientific progress in these programs;
- the outcome of potential partnering or licensing transactions, if any;
- competing technological developments;
- our proprietary patent position, if any, in our products; and
- the regulatory approval process for our products.

As of the date of this report, our CEO is our only full-time employee. We are also utilizing approximately 10 consultants, the majority of whom previously were either employees of or consultants to our company, to support our on-going operations. Our internal research and development efforts since June 2012 have been, and as of the date of this report they continue to be, minimal and focused on our clinical pipeline.

In March 2014, we raised significant funds and believe that our currently available cash and cash equivalents, which include an upfront licensing fee received from MiNA in January 2015, will be sufficient to fund our limited operations through July 2015. We will need to raise substantial additional funds through public or private equity offerings, debt financings or additional strategic alliances and licensing arrangements to continue our operations beyond July 2015. To the extent that we wish to conduct significant pre-clinical activities prior to that date, which we plan to do, we will have to raise capital to do so. We may not be able to obtain additional financing on terms favorable to us, if at all. General market conditions, as well as market conditions for companies that have recently faced financial distress, may make it very difficult for us to seek financing from the capital markets, and the terms of any financing may adversely affect the holdings or the rights of our stockholders. For example, if we raise additional funds by issuing equity securities, further dilution to our stockholders will result, which may substantially dilute the value of their investment. In addition, as a condition to providing additional funds to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. Debt financing, if available, may involve restrictive covenants that could limit our flexibility to conduct future business activities and, in the event of insolvency, could be paid before holders of equity securities received any distribution of corporate assets. We may be required to relinquish rights to our technologies or drug

candidates, or grant licenses through alliance, joint venture or agreements on terms that are not favorable to us, in order to raise additional funds. If adequate funds are not available, we may have to further delay, reduce or eliminate one or more of our planned activities, or terminate our operations. These actions would likely reduce the market price of our common stock.

We have no history of profitability and there is a potential for fluctuation in operating results.

We have experienced significant operating losses since inception. We currently have no revenues from product sales and will not have any such revenues unless and until a marketable product is successfully developed by us or our partners, receives regulatory approvals, and is successfully manufactured and distributed to the market. We expect to continue to experience losses for the foreseeable future. See "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Forward-Looking Statements".

We and our partners are developing products based on modulation of coding and non-coding RNA targets. The process of developing such products requires significant research and development efforts, including basic research, pre-clinical and clinical development, and regulatory approval. These activities, together with our sales, marketing, general and administrative expenses, have resulted in operating losses in the past, and there can be no assurance that we can achieve profitability in the future. Our ability to achieve profitability depends on our ability, alone or with our partners, to develop drug candidates, conduct pre-clinical development and clinical trials, obtain necessary regulatory approvals, and manufacture, distribute, market and sell drug products. We cannot assure you of the success of any of these activities or predict if or when we will ever become profitable.

There is substantial doubt about our ability to continue as a going concern, which may affect our ability to obtain future financing and may require us to curtail our operations.

Our financial statements as of December 31, 2014 were prepared under the assumption that we will continue as a going concern. The independent registered public accounting firm that audited our 2014 consolidated financial statements, in their report, included an explanatory paragraph referring to our recurring losses and expressing substantial doubt in our ability to continue as a going concern. Our financial statements do not include any adjustments that might result from the outcome of this uncertainty. At December 31, 2014, we had cash and cash equivalents of $1.8 million. Our ability to continue as a going concern depends on our ability to raise substantial additional funds through public or private equity offerings, debt financings or additional strategic alliances and licensing arrangements.

If we are unable to raise sufficient additional capital, we may seek to merge with or be acquired by another entity, and that transaction may adversely affect our business and the value of our securities.

If we are unable to raise sufficient additional capital, we may seek to merge or combine with, or otherwise be acquired by, another entity with a stronger cash position, complementary work force, or product candidate portfolio or for other reasons. We believe the market price for our common stock may not accurately reflect the value of our business. While we will continue to seek to maximize the value of our business to our stockholders, the most attractive option for doing so may require us to consummate a transaction involving a merger or combination of our company with, or an acquisition of our company by, another entity. There are numerous risks associated with merging, combining or otherwise being acquired. These risks include, among others, incorrectly assessing the quality of a prospective acquirer or merger-partner, encountering greater than anticipated costs in integrating businesses, facing resistance from employees and being unable to profitably deploy the assets of the new entity. The operations, financial condition, and prospects of the post-transaction entity depend in part on our and our acquirer/merger-partner's ability to successfully integrate the operations related to our product candidates, business and technologies. We may be unable to integrate operations successfully or to achieve expected cost savings, and any cost savings that are realized may be offset by losses in revenues or other charges to operations. As a result, our stockholders may not realize the full value of their investment.

If we lose our Chief Executive Officer, or if we are unable to attract and retain additional personnel, then we may be unable to successfully develop our business.

If we are unable to retain J. Michael French, our president and CEO, or any other executive officers that we hire after the date of this report, our business could be seriously harmed. In addition, if we are unable to attract qualified personnel as we seek to re-start our operations, our business could be seriously harmed. Whether or not our key managers or our key personal have executed an employment agreement, there can be no assurance that we will be able to retain them or replace any of them if we lose their services for any reason. This uncertainty is particularly true given our current financial condition, recent history and requirements necessary to potentially restart research operations. Failure to attract and retain qualified personnel may compromise our ability to negotiate and enter into additional collaborative arrangements, delay our research and development efforts, delay testing of our product candidates, delay the regulatory approval process or prevent us from successfully commercializing our product candidates. In addition, if we have to replace any of these individuals, we may not be able to replace knowledge that they have about our operations.

If we make strategic acquisitions, we will incur a variety of costs and might never realize the anticipated benefits.

We have limited experience in independently identifying acquisition candidates and integrating the operations of acquisition candidates with our company. If appropriate opportunities become available, we might attempt to acquire approved products, additional drug candidates, technologies or businesses that we believe are a strategic fit with our business. If we pursue any transaction of that sort, the process of negotiating the acquisition and integrating an acquired product, drug candidate, technology or business might result in operating difficulties and expenditures and might require significant management attention that would otherwise be available for ongoing development of our business, whether or not any such transaction is ever consummated. Moreover, we might never realize the anticipated benefits of any acquisition. Future acquisitions could result in potentially dilutive issuances of equity securities, the incurrence of debt, contingent liabilities, or impairment expenses related to goodwill, and impairment or amortization expenses related to other intangible assets, which could harm our financial condition.

Failure of our internal control over financial reporting could harm our business and financial results.

Our management is responsible for establishing and maintaining effective internal control over financial reporting. Internal control over financial reporting is a process to provide reasonable assurance regarding the reliability of financial reporting for external purposes in accordance with accounting principles generally accepted in the United States. Internal control over financial reporting includes maintaining records that in reasonable detail accurately and fairly reflect our transactions; providing reasonable assurance that transactions are recorded as necessary for preparation of the financial statements; providing reasonable assurance that receipts and expenditures of our assets are made in accordance with management authorization; and providing reasonable assurance that unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements would be prevented or detected on a timely basis. Any failure to maintain an effective system of internal control over financial reporting could limit our ability to report our financial results accurately and timely or to detect and prevent fraud.

Our business and operations could suffer in the event of system failures.

Our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Such events could cause interruption of our operations. For example, the loss of pre-clinical trial data or data from completed or ongoing clinical trials for our product candidates, if any, could result in delays in our regulatory filings and development efforts and significantly increase our costs. To the extent that any disruption or security breach were to result in a loss of or damage to our data, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the development of our product candidates could be delayed.

RISKS RELATED TO THE DEVELOPMENT AND REGULATORY APPROVAL OF OUR DRUG CANDIDATES

RNA-based drug development is unproven and may never lead to marketable products.

Our future success depends on the successful development, by us or our partners, of RNA-based products and technologies. Neither we, nor any other company, including any of our partners, has received regulatory approval to market siRNA, antagomir or miRNA mimics as therapeutic agents. The scientific discoveries that form the basis for our efforts to discover and develop new RNA-based drugs are relatively new. The scientific evidence to support the feasibility of developing drugs based on these discoveries is both preliminary and limited.

Relatively few RNA-based product candidates have ever been tested in animals or humans, none of which have received regulatory approval. We currently have only limited data suggesting that we can introduce typical drug-like properties and characteristics into oligonucleotides, such as favorable distribution within the body or tissues or the ability to enter cells and exert their intended effects. In addition, RNA-based compounds may not demonstrate in patients the chemical and pharmacological properties ascribed to them in laboratory studies, and they may interact with human biological systems in unforeseen, ineffective or harmful ways. We may make significant expenditures developing RNA-based technologies without success. As a result, we and our partners may never develop a marketable product utilizing our technologies. If neither we nor any of our partners develops and commercializes drugs based upon our technologies, our operations will not become profitable.

Further, our focus on oligonucleotide-based drug discovery and development, as opposed to more proven technologies for drug development, increases the risks associated with the ownership of our common stock. If neither we nor any of our partners is successful in developing a product candidate using our technology, we may be required to change the scope and direction of our activities. In that case, we may not be able to identify and implement successfully an alternative business strategy.

All of our programs, other than our program for CEQ508, are in pre-clinical studies or early stage research. If we or our partners are unable to develop and commercialize product candidates utilizing our technologies, our business will be adversely affected.

A key element of our strategy is to discover, develop and commercialize a portfolio of new products through internal efforts and through those of our current or future strategic partnerships. Whether or not any product candidates are ultimately identified, research programs to identify new disease targets and product candidates require substantial technical, financial and human resources, which we currently do not have. These research programs may initially show promise in identifying potential product candidates, yet fail to yield a successful commercial product for many reasons, including the following:

- competitors may develop alternatives that render our product candidates (or those of our partners) obsolete;
- a product candidate may not have a sustainable intellectual property position in major markets;
- a product candidate may, after additional studies, be shown to have harmful side effects or other characteristics that indicate it is unlikely to be effective;
- a product candidate may not receive regulatory approval;
- a product candidate may not be capable of production in commercial quantities at an acceptable cost, or at all; or
- a product candidate may not be accepted by patients, the medical community or third-party payors.

Clinical trials of product candidates utilizing our technologies would be expensive and time-consuming, and the results of any of these trials would be uncertain.

The research and development programs of our company and our partners with respect to oligonucleotide-based products are at an early stage. Before obtaining regulatory approval for the sale of any product candidates, we and our partners must conduct expensive and extensive pre-clinical tests and

clinical trials to demonstrate the safety and efficacy of such product candidates. Pre-clinical and clinical testing is a long, expensive and uncertain process, and the historical failure rate for product candidates is high. The length of time generally varies substantially according to the type of drug, complexity of clinical trial design, regulatory compliance requirements, intended use of the drug candidate and rate of patient enrollment for the clinical trials.

A failure of one or more pre-clinical studies or clinical trials can occur at any stage of testing. We and our partners may experience numerous unforeseen events during, or as a result of, the pre-clinical testing and the clinical trial process that could delay or prevent the receipt of regulatory approval or the commercialization of our product candidates, including:

- regulators may not authorize us to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- pre-clinical tests or clinical trials may produce negative or inconclusive results, and we or a partner may decide, or a regulator may require us, to conduct additional pre-clinical testing or clinical trials, or we or a partner may abandon projects that were previously expected to be promising;
- enrollment in clinical trials may be slower than anticipated or participants may drop out of clinical trials at a higher rate than anticipated, resulting in significant delays;
- third party contractors may fail to comply with regulatory requirements or meet their contractual obligations in a timely manner;
- product candidates may have very different chemical and pharmacological properties in humans than in laboratory testing and may interact with human biological systems in unforeseen, ineffective or harmful ways;
- the suspension or termination of clinical trials if the participants are being exposed to unacceptable health risks;
- regulators, including the FDA, may require that clinical research be held, suspended or terminated for various reasons, including noncompliance with regulatory requirements;
- the cost of clinical trials may be greater than anticipated;
- the supply or quality of drug candidates or other materials necessary to conduct clinical trials may be insufficient or inadequate; and
- effects of product candidates may not have the desired effects or may include undesirable side effects or the product candidates may have other unexpected characteristics.

Further, even if the results of pre-clinical studies or clinical trials are initially positive, it is possible that we or a partner will obtain different results in the later stages of drug development or that results seen in clinical trials will not continue with longer term treatment. Drugs in late stages of clinical development may fail to show the desired safety and efficacy traits despite having progressed through initial clinical testing. For example, positive results in early Phase 1 or Phase 2 clinical trials may not be repeated in larger Phase 2 or Phase 3 clinical trials. It is expected that all of the drug candidates that may be developed by us or our partners based on our technologies will be prone to the risks of failure inherent in drug development. The clinical trials of any or all of the drug candidates of us or our partners could be unsuccessful, which would prevent the commercialization of these drugs. The FDA conducts its own independent analysis of some or all of the pre-clinical and clinical trial data submitted in a regulatory filing and often comes to different and potentially more negative conclusions than the analysis performed by the drug sponsor. The failure to develop safe, commercially viable drugs approved by the FDA would substantially impair our ability to generate product sales and sustain our operations and would materially harm our business and adversely affect our stock price. In addition, significant delays in pre-clinical studies and clinical trials will impede the ability of us or a partner to seek regulatory approvals, commercialize drug candidates and generate revenue, as well as substantially increase development costs.

Even if regulatory approvals are obtained for our products, such products will be subject to ongoing regulatory review. If we or a partner fail to comply with continuing U.S. and foreign regulations, the approvals to market drugs could be lost and our business would be materially adversely affected.

Following any initial FDA or foreign regulatory approval of any drugs we or a partner may develop, such drugs will continue to be subject to regulatory review, including the review of adverse drug experiences and clinical results that are reported after such drugs are made available to patients. This would include results from any post marketing studies or vigilance required as a condition of approval. The manufacturer and manufacturing facilities used to make any drug candidates will also be subject to periodic review and inspection by regulatory authorities, including the FDA. The discovery of any new or previously unknown problems with the product, manufacturer or facility may result in restrictions on the drug or manufacturer or facility, including withdrawal of the drug from the market. Marketing, advertising and labeling also will be subject to regulatory requirements and continuing regulatory review. The failure to comply with applicable continuing regulatory requirements may result in fines, suspension or withdrawal of regulatory approval, product recalls and seizures, operating restrictions and other adverse consequences.

We and our partners are subject to extensive U.S. and foreign government regulation, including the requirement of approval before products may be marketed.

We, our present and future collaborators, and the drug product candidates developed by us or in collaboration with partners are subject to extensive regulation by governmental authorities in the U.S. and other countries. Failure to comply with applicable requirements could result in, among other things, any of the following actions: warning letters, fines and other civil penalties, unanticipated expenditures, delays in approving or refusal to approve a product candidate, product recall or seizure, interruption of manufacturing or clinical trials, operating restrictions, injunctions and criminal prosecution.

Our product candidates and those of our partners cannot be marketed in the U.S. without FDA approval or clearance, and they cannot be marketed in foreign countries without applicable regulatory approval. Neither the FDA nor any foreign regulatory authority has approved any of the product candidates being developed by us or our partners based on our technologies. These product candidates are in pre-clinical and early clinical development and will have to be approved by the FDA or applicable foreign regulatory authorities before they can be marketed in the U.S. or abroad. Obtaining regulatory approval requires substantial time, effort, and financial resources, and may be subject to both expected and unforeseen delays, including, without limitation, citizen's petitions or other filings with the FDA, and there can be no assurance that any approval will be granted on a timely basis, if at all, or that delays will be resolved favorably or in a timely manner. If our product candidates are not approved in a timely fashion, or are not approved at all, our business and financial condition may be adversely affected.

In addition, both before and after regulatory approval, we, our collaborators and our product candidates are subject to numerous requirements by the FDA and foreign regulatory authorities covering, among other things, testing, manufacturing, quality control, labeling, advertising, promotion, distribution and export. These requirements may change and additional government regulations may be promulgated that could affect us, our collaborators or our product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the U.S. or abroad. There can be no assurance that neither we nor any of our partners will be required to incur significant costs to comply with such laws and regulations in the future or that such laws or regulations will not have a material adverse effect upon our business.

We have used, and may continue to use, hazardous chemicals and biological materials in our business. Any disputes relating to improper use, handling, storage or disposal of these materials could be time-consuming and costly.

Our research and development operations have involved, and if continued in the future will likely continue to involve, the use of hazardous and biological, potentially infectious, materials. Such use subjects us to the risk of accidental contamination or discharge or any resultant injury from these materials. Federal, state and local laws and regulations govern the use, manufacture, storage, handling and disposal of these materials and specific waste products. We could be subject to damages, fines or penalties in the event of an

improper or unauthorized release of, or exposure of individuals to, these hazardous materials, and our liability could be substantial. The costs of complying with these current and future environmental laws and regulations may be significant, thereby impairing our business.

We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of biohazardous materials. We maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of these materials. The limits of our workers' compensation insurance are mandated by state law, and our workers' compensation liability is capped at these state-mandated limits. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials. Additional federal, state and local laws and regulations affecting our operations may be adopted in the future. We may incur substantial costs to comply with, and substantial fines or penalties if we violate, any of these laws or regulations.

Failure to comply with foreign regulatory requirements governing human clinical trials and marketing approval for drugs could prevent the sale of drug candidates based on our technologies in foreign markets, which may adversely affect our operating results and financial condition.

The requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement for marketing drug candidates based on our technologies outside the U.S. vary greatly from country to country. We have, and our partners may have, limited experience in obtaining foreign regulatory approvals. The time required to obtain approvals outside the U.S. may differ from that required to obtain FDA approval. Neither we nor our partners may be able to obtain foreign regulatory approvals on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other countries or by the FDA. Failure to comply with these regulatory requirements or obtain required approvals could restrict the development of foreign markets for our drug candidates and may have a material adverse effect on our financial condition or results of operations.

RISKS RELATED TO OUR DEPENDENCE ON THIRD PARTIES

We may become dependent on our collaborative arrangements with third parties for a substantial portion of our revenue, and our development and commercialization activities may be delayed or reduced if we fail to initiate, negotiate or maintain successful collaborative arrangements.

We are, in part, dependent on current and possible future collaborators to develop and commercialize products based on our technologies and to provide the regulatory compliance, sales, marketing and distribution capabilities required for the success of our business. If we fail to secure or maintain successful collaborative arrangements, our development and commercialization activities will be delayed, reduced or terminated, and our revenues could be materially and adversely impacted.

Over the next several years, we may depend on these types of collaborations for a significant portion of our revenue. The potential future milestone and royalty payments and cost reimbursements from collaboration agreements could provide an important source of financing for our research and development programs, thereby facilitating the application of our technology to the development and commercialization of our products. These collaborative agreements might be terminated either by us or by our partners upon the satisfaction of certain notice requirements. Our partners may not be precluded from independently pursuing competing products and drug delivery approaches or technologies. Even if our partners continue their contributions to our collaborative arrangements, of which there can be no assurance, they may nevertheless determine not to actively pursue the development or commercialization of any resulting products. Our partners may fail to perform their obligations under the collaborative arrangements or may be slow in performing their obligations. In addition, our partners may experience financial difficulties at any time that could prevent them from having available funds to contribute to these collaborations. If our collaborators fail to conduct their commercialization, regulatory compliance, sales and marketing or distribution activities successfully and in a timely manner, or if they terminate or materially modify their agreements with us, the development and commercialization of one or more product candidates could be delayed, curtailed or terminated because we may not have sufficient financial resources or capabilities to continue such development and commercialization on our own.

For example, since the beginning of 2011, we have entered into agreements with Mirna, ProNAi, Monsanto, Avecia and MiNA, among others, regarding the development and/or commercialization of certain programs and technologies in specified fields of use. We may receive milestone and/or royalty payments as a result of each of these agreements. If our partner with respect to any agreement terminates the applicable agreement or fails to perform its obligations thereunder, we may not receive any revenues from the technology that we have licensed pursuant to the agreement, including any milestone or royalty payments.

An interruption in the supply of raw and bulk materials needed for the development of our product candidates could cause product development to be slowed or stopped.

We and our partners may obtain supplies of critical raw and bulk materials used in research and development efforts from several suppliers, and long-term contracts may not be in place with any or all of these suppliers. While existing arrangements may supply sufficient quantities of raw and bulk materials needed to accomplish the current preclinical and clinical development of product candidates, there can be no assurance that sufficient quantities of product candidates could be manufactured if our suppliers are unable or unwilling to supply such materials. Any delay or disruption in the availability of raw or bulk materials could slow or stop research and development of the relevant product.

We rely and anticipate that we will continue to rely on third parties to conduct clinical trials, and those third parties may not perform satisfactorily, including failing to meet established timelines for the completion of such clinical trials.

We are, and anticipate that we and certain of our partners will continue to be, dependent on contract research organizations, third-party vendors and investigators for performing or managing pre-clinical testing and clinical trials related to drug discovery and development efforts. These parties are not employed by us or our partners, and neither we nor our partners can control the amount or timing of resources that they devote to our programs. If they fail to devote sufficient time and resources to our drug development programs or if their performance is substandard, it will delay the development and commercialization of our product candidates. The parties with which we and our partners contract for execution of clinical trials play a significant role in the conduct of the trials and the subsequent collection and analysis of data. Their failure to meet their obligations could adversely affect clinical development of our product candidates. Moreover, these parties also may have relationships with other commercial entities, some of which may compete with us and our partners. If they assist our competitors, it could harm our competitive position.

If we or our partners lose our relationship with any one or more of these parties, there could be a significant delay in both identifying another comparable provider and then contracting for its services. An alternative provider may not be available on reasonable terms, if at all. Even if we locate an alternative provider, is it likely that this provider may need additional time to respond to our needs and may not provide the same type or level of service as the original provider. In addition, any alternative provider will be subject to current Good Laboratory Practices ("cGLP") and similar foreign standards and neither we nor our partners have control over compliance with these regulations by these providers. Consequently, if these providers do not adhere to these practices and standards, the development and commercialization of our product candidates could be delayed.

We do not have experience in marketing, selling or distributing our products, and we may need to rely on marketing partners or contract sales companies.

Even if we are able to develop our products and obtain necessary regulatory approvals, we do not have experience or capabilities in marketing, selling or distributing our products. We currently have no sales, marketing and distribution infrastructure. Accordingly, we will be dependent on our ability to build this capability ourselves, which would require the investment of significant financial and management resources, or to find collaborative marketing partners or contract sales companies for commercial sale of our internally-developed products. Even if we find a potential marketing partner, of which there can be no assurance, we may not be able to negotiate a licensing contract on favorable terms to justify our investment or achieve adequate revenues.

We have very limited manufacturing experience or resources, and we must incur significant costs to develop this expertise or rely on third parties to manufacture our products.

We have very limited manufacturing experience. Prior to the cessation of substantially all of our business activities in June 2012, our internal manufacturing capabilities were limited to small-scale production of non-cGMP material for use in *in vitro* and *in vivo* experiments. Some of our product candidates utilize specialized formulations whose scale-up and manufacturing could be very difficult. We also have very limited experience in such scale-up and manufacturing, requiring us to depend on a limited number of third parties, who might not be able to deliver in a timely manner, or at all. In order to develop products, apply for regulatory approvals and commercialize our products, we will need to develop, contract for, or otherwise arrange for the necessary manufacturing capabilities. We may manufacture clinical trial materials ourselves or we may rely on others to manufacture the materials we will require for any clinical trials that we initiate. For example, in restarting our FAP clinical trial, we may find that the clinical trial material is no longer suitable for the FAP clinical trial in that the material no longer meets certain specifications agreed upon with the FDA. If we need to remanufacture clinical trial material to restart the FAP trial, we may incur substantial delays and costs associated with the manufacturing of new clinical material.

There are a limited number of manufacturers that supply RNA. We have relied on several contract manufacturers for our supply of synthetic RNA. There are risks inherent in pharmaceutical manufacturing that could affect the ability of our contract manufacturers to meet our delivery time requirements or provide adequate amounts of material to meet our needs. Included in these risks are synthesis and purification failures and contamination during the manufacturing process, which could result in unusable product and cause delays in our development process, as well as additional expense to us. To fulfill our RNA requirements, if any, we may also need to secure alternative suppliers of synthetic RNAs. In addition to the manufacture of the synthetic RNAs, we may have additional manufacturing requirements related to the technology required to deliver the RNA to the relevant cell or tissue type. In some cases, the delivery technology we utilize is highly specialized or proprietary, and for technical and legal reasons, we may have access to only one or a limited number of potential manufacturers for such delivery technology. Failure by these manufacturers to properly formulate our RNAs for delivery could also result in unusable product and cause delays in our discovery and development process, as well as additional expense to us.

The manufacturing process for any products based on our technologies that we or our partners may develop is subject to the FDA and foreign regulatory authority approval process, and we or our partners will need to contract with manufacturers who can meet all applicable FDA and foreign regulatory authority requirements on an ongoing basis. In addition, if we receive the necessary regulatory approval for any product candidate, we also expect to rely on third parties, including our commercial collaborators, to produce materials required for commercial supply. We may experience difficulty in obtaining adequate manufacturing capacity for our needs. If we are unable to obtain or maintain contract manufacturing for these product candidates, or to do so on commercially reasonable terms, we may not be able to successfully develop and commercialize our products.

To the extent that we enter into manufacturing arrangements with third parties, we will depend on these third parties to perform their obligations in a timely manner and consistent with regulatory requirements, including those related to quality control and quality assurance. The failure of a third-party manufacturer to perform its obligations as expected could adversely affect our business in a number of ways, including:

- we may not be able to initiate or continue pre-clinical and clinical trials of products that are under development;
- we may be delayed in submitting regulatory applications, or receiving regulatory approvals, for our product candidates;
- we may lose the cooperation of our collaborators;
- our products could be the subject of inspections by regulatory authorities;
- we may be required to cease distribution or recall some or all batches of our products; and

- ultimately, we may not be able to meet commercial demands for our products.

If a third-party manufacturer with whom we contract fails to perform its obligations, we may be forced to manufacture the materials ourselves, for which we may not have the capabilities or resources, or enter into an agreement with a different third-party manufacturer, which we may not be able to do on reasonable terms, if at all. In some cases, the technical skills required to manufacture our product may be unique to the original manufacturer and we may have difficulty transferring such skills to a back-up or alternate supplier, or we may be unable to transfer such skills at all. In addition, if we are required to change manufacturers for any reason, as may be the case for additional clinical material for the FAP clinical trial, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop product candidates in a timely manner or within budget. Furthermore, a manufacturer may possess technology related to the manufacture of our product candidate that such manufacturer owns independently. This would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to have another third party manufacture our products.

RISKS RELATED TO OUR INTELLECTUAL PROPERTY AND OTHER LEGAL MATTERS

If we are unable to adequately protect our proprietary technology from legal challenges, infringement or alternative technologies, our competitive position may be hurt and our operating results may be negatively impacted.

Our business is based upon the development and delivery of RNA-based therapeutics, and we rely on the issuance of patents, both in the U.S. and internationally, for protection against competitive technologies. Although we believe we exercise the necessary due diligence in our patent filings, our proprietary position is not established until the appropriate regulatory authorities actually issue a patent, which may take several years from initial filing or may never occur.

Moreover, even the established patent positions of pharmaceutical companies are generally uncertain and involve complex legal and factual issues. Although we believe our issued patents are valid, third parties may infringe our patents or may initiate proceedings challenging the validity or enforceability of our patents. The issuance of a patent is not conclusive as to its claim scope, validity or enforceability. Challenges raised in patent infringement litigation we initiate or in proceedings initiated by third parties may result in determinations that our patents have not been infringed or that they are invalid, unenforceable or otherwise subject to limitations. In the event of any such determinations, third parties may be able to use the discoveries or technologies claimed in our patents without paying us licensing fees or royalties, which could significantly diminish the value of these discoveries or technologies. As a result of such determinations, we may be enjoined from pursuing commercialization of potential products or may be required to obtain licenses, if available, to the third party patents or to develop or obtain alternative technology. Responding to challenges initiated by third parties may require significant expenditures and divert the attention of our management and key personnel from other business concerns.

Furthermore, it is possible others will infringe or otherwise circumvent our issued patents and that we will be unable to fund the cost of litigation against them or that we would elect not to pursue litigation. In addition, enforcing our patents against third parties may require significant expenditures regardless of the outcome of such efforts. We also cannot assure you that others have not filed patent applications for technology covered by our pending applications or that we were the first to invent the technology. There may also exist third party patents or patent applications relevant to our potential products that may block or compete with the technologies covered by our patent applications and third parties may independently develop IP similar to our patented IP, which could result in, among other things, interference proceedings in the U.S. Patent and Trademark Office to determine priority of invention.

In addition, we may not be able to protect our established and pending patent positions from competitive technologies, which may provide more effective therapeutic benefit to patients and which may therefore make our products, technology and proprietary position obsolete.

We also rely on copyright and trademark protection, trade secrets, know-how, continuing technological innovation and licensing opportunities. In an effort to maintain the confidentiality and ownership of our trade secrets and proprietary information, we have typically required our employees, consultants, advisors and others to whom we disclose confidential information to execute confidentiality and proprietary information agreements. However, it is possible that these agreements may be breached, invalidated or rendered unenforceable, and if so, there may not be an adequate corrective remedy available. Furthermore, like many companies in our industry, we may from time to time hire scientific personnel formerly employed by other companies involved in one or more areas similar to the activities we conduct. In some situations, our confidentiality and proprietary information agreements may conflict with, or be subject to, the rights of third parties with whom our employees, consultants or advisors have prior employment or consulting relationships. Although we have typically required our employees and consultants to maintain the confidentiality of all confidential information of previous employers, we or these individuals may be subject to allegations of trade secret misappropriation or other similar claims as a result of their prior affiliations. Finally, others may independently develop substantially equivalent proprietary information and techniques, or otherwise gain access to our trade secrets. Our failure to protect our proprietary information and techniques may inhibit or limit our ability to exclude certain competitors from the market and execute our business strategies.

If we are unable to adequately protect our proprietary intellectual property from legal challenges, infringement or alternative technologies, we will not be able to compete effectively in the drug discovery and development business.

Because intellectual property rights are of limited duration, expiration of intellectual property rights and licenses will negatively impact our operating results.

Intellectual property rights, such as patents and license agreements based on those patents, generally are of limited duration. Our operating results depend on our patents and IP licenses. Therefore, the expiration or other loss of rights associated with IP and IP licenses can negatively impact our business.

Our patent applications may be inadequate in terms of priority, scope or commercial value.

We apply for patents covering our discoveries and technologies as we deem appropriate and as our resources permit. However, we or our partners may fail to apply for patents on important discoveries or technologies in a timely fashion or at all. Also, our pending patent applications may not result in the issuance of any patents. These applications may not be sufficient to meet the statutory requirements for patentability, and therefore we may be unable to obtain enforceable patents covering the related discoveries or technologies we may want to commercialize. In addition, because patent applications are maintained in secrecy for approximately 18 months after filing, other parties may have filed patent applications relating to inventions before our applications covering the same or similar inventions. In addition, foreign patent applications are often published initially in local languages, and until an English language translation is available it can be impossible to determine the significance of a third party invention. Any patent applications filed by third parties may prevail over our patent applications or may result in patents that issue alongside patents issued to us, leading to uncertainty over the scope of the patents or the freedom to practice the claimed inventions.

Although we have acquired and in-licensed a number of issued patents, the discoveries or technologies covered by these patents may not have any therapeutic or commercial value. Also, issued patents may not provide commercially meaningful protection against competitors. Other parties may be able to design around our issued patents or independently develop products having effects similar or identical to our patented product candidates. In addition, the scope of our patents is subject to considerable uncertainty and competitors or other parties may obtain similar patents of uncertain scope.

We are dependent on technologies we license, and if we lose the right to license such technologies or we fail to license new technologies in the future, our ability to develop new products would be harmed.

We currently are dependent on licenses from third parties for certain of our key technologies relating to fundamental chemistry technologies. Our current licenses impose, and any future licenses we enter into are likely to impose, various development, funding, royalty, diligence, sublicensing, insurance and other

obligations on us. If our license with respect to any of these technologies is terminated for any reason, the development of the products contemplated by the licenses would be delayed, or suspended altogether, while we seek to license similar technology or develop new non-infringing technology. The costs of obtaining new licenses are high, and many patents in the RNA field have already been exclusively licensed to third parties, including our competitors. If our existing license is terminated, the development of the products contemplated by the licenses could be delayed or terminated and we may not be able to negotiate additional licenses on acceptable terms, if at all, which would have a material adverse effect on our business.

We may be required to defend lawsuits or pay damages for product liability claims.

Our business inherently exposes us to potential product liability claims. We may face substantial product liability exposure in human clinical trials that we may initiate and for products that we sell, or manufacture for others to sell, after regulatory approval. The risk exists even with respect to those drugs that are approved by regulatory agencies for commercial distribution and sale and are manufactured in facilities licensed and regulated by regulatory agencies. Any product liability claims, regardless of their merits, could be costly, divert management's attention, delay or prevent completion of our clinical development programs, and adversely affect our reputation and the demand for our products. We currently do not have product liability insurance. We will need to obtain such insurance as we believe is appropriate for our stage of development and may need to obtain higher levels of such insurance if we were ever to market any of our product candidates. Any insurance we have or may obtain may not provide sufficient coverage against potential liabilities. Furthermore, clinical trial and product liability insurance is becoming increasingly expensive. As a result, we may be unable to obtain sufficient insurance at a reasonable cost to protect us against losses caused by product liability claims that could have a material adverse effect on our business.

RISKS RELATED TO THE COMMERCIALIZATION OF OUR PRODUCT CANDIDATES

Our product development efforts may not result in commercial products.

Our future results of operations depend, to a significant degree, upon our and any collaborators' ability to successfully develop and commercialize pharmaceutical products. The development and commercialization process, particularly with respect to innovative products, is both time consuming and costly and involves a high degree of business risk. Successful product development in the pharmaceutical industry is highly uncertain, and very few research and development projects result in a commercial product. Product candidates that appear promising in the early phases of development, such as in preclinical testing or in early human clinical trials, may fail to reach the market for a number of reasons, such as:

- a product candidate may not perform as expected in later or broader trials in humans and limit marketability of such product candidate;
- necessary regulatory approvals may not be obtained in a timely manner, if at all;
- a product candidate may not be able to be successfully and profitably produced and marketed;
- third parties may have proprietary rights to a product candidate, and do not allow sale on reasonable terms; or
- a product candidate may not be financially successful because of existing therapeutics that offer equivalent or better treatments.

Three product candidates, our own FAP therapeutic and two through our partners, ProNAi and Mirna, utilizing our technologies have commenced human clinical studies. Such product candidates have not been approved by the FDA or any foreign regulatory authority. The FAP trial is currently on hold, and we expect to restart the trial and dose Cohort 3 at such time that we have reestablished clinical operations, obtained new clinical trial material and complied with all regulatory requirements. There can be no assurance that any of these product candidates, or other product candidates that may enter research or development, will ever be successfully commercialized, and delays in any part of the process or the inability to obtain regulatory approval could adversely affect our operating results by restricting introduction of new products by us or and collaborators.

Even if we are successful in developing and commercializing a product candidate, it is possible that the commercial opportunity for oligonucleotide-based therapeutics will be limited.

The product candidates based on our technologies that are being developed are based on new technologies and therapeutic approaches, none of which have yet been brought to market. Key participants in pharmaceutical marketplaces, such as physicians, third-party payors and consumers, may not accept a product intended to improve therapeutic results based on RNA mechanisms of action. Accordingly, while we believe there will be a commercial market for nucleic acid-based therapeutics utilizing our technologies, there can be no assurance that this will be the case, in particular given the novelty of the field. Many factors may affect the market acceptance and commercial success of any potential products, including:

- establishment and demonstration of the effectiveness and safety of the drugs;
- timing of market entry as compared to competitive products and alternative treatments;
- benefits of our drugs relative to their prices and the comparative price of competing products and treatments;
- availability of adequate government and third-party payor reimbursement;
- marketing and distribution support of our products;
- safety, efficacy and ease of administration of our product candidates;
- willingness of patients to accept, and the willingness of medical professionals to prescribe, relatively new therapies; and
- any restrictions on labeled indications.

RISKS RELATED TO OUR INDUSTRY

Any drugs based on our technologies that we or any of our partners develop may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, which could have a material adverse effect on our business and financial results.

The success of the products based on our technologies will depend upon the extent to which third-party payors, such as Medicare, Medicaid and other domestic and international government programs, private insurance plans and managed care programs, provide reimbursement for the use of such products. Most third-party payors may deny reimbursement if they determine that a medical product was not used in accordance with cost-effective treatment methods, as determined by the third-party payor, or was used for an unapproved indication.

Third-party payors also may refuse to reimburse for experimental procedures and devices. Furthermore, because our programs are in the early stages of development, we are unable at this time to determine their cost-effectiveness and the level or method of reimbursement. Increasingly, the third-party payors, who reimburse patients, such as government and private insurance plans, are requiring that drug companies provide them with predetermined discounts from list prices, and are challenging the prices charged for medical products. If the price charged for any products based on our technologies that we or our partners develop is inadequate in light of our development and other costs, our profitability could be adversely affected.

We expect that drugs based on our technologies that we or a partner develop may need to be administered under the supervision of a physician. Under currently applicable law, drugs that are not usually self-administered may be eligible for coverage by the Medicare program if they:

- are “incidental” to a physician’s services;
- are “reasonable and necessary” for the diagnosis or treatment of the illness or injury for which they are administered according to accepted standards of medical practice;
- are not excluded as immunizations; and
- have been approved by the FDA.

There may be significant delays in obtaining insurance coverage for newly-approved drugs, and insurance coverage may be more limited than the purpose for which the drug is approved by the FDA. Moreover, eligibility for insurance coverage does not imply that any drug will be reimbursed in all cases or at a rate that covers costs, including research, development, manufacture, sale and distribution. Interim payments for new drugs, if applicable, may also not be sufficient to cover costs and may not be made permanent. Reimbursement may be based on payments for other services and may reflect budgetary constraints or imperfections in Medicare data. Net prices for drugs may be reduced by mandatory discounts or rebates required by government health care programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates. The inability to promptly obtain coverage and profitable reimbursement rates from both government-funded and private payors for new drugs based on our technologies that we or our partners develop could have a material adverse effect on our operating results, our ability to raise capital, and our overall financial condition.

We believe that the efforts of governments and third-party payors to contain or reduce the cost of healthcare and legislative and regulatory proposals to broaden the availability of healthcare will continue to affect the business and financial condition of pharmaceutical and biopharmaceutical companies. A number of legislative and regulatory changes in the healthcare system in the United States and other major healthcare markets have been proposed in recent years, and such efforts have expanded substantially in recent years. These developments have included prescription drug benefit legislation that was enacted and took effect in January 2006, healthcare reform legislation recently enacted by certain states, and major healthcare reform legislation that was passed by Congress and enacted into law in the United States in 2010. These developments could, directly or indirectly, affect our ability to sell our products, if approved, at a favorable price.

The full effects of the U.S. healthcare reform legislation cannot be known until the new law is fully implemented through regulations or guidance issued by the Centers for Medicare & Medicaid Services and other federal and state healthcare agencies. The financial impact of the U.S. healthcare reform legislation over the next few years will depend on a number of factors, including but not limited to the policies reflected in implementing regulations and guidance, and changes in sales volumes for products affected by the new system of rebates, discounts and fees. The new legislation may also have a positive impact on our future net sales, if any, by increasing the aggregate number of persons with healthcare coverage in the United States.

Moreover, we cannot predict what healthcare reform initiatives may be adopted in the future. Further federal and state legislative and regulatory developments are likely, and we expect ongoing initiatives in the United States to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates based on our technologies that are successfully developed and for which regulatory approval is obtained, and may affect our overall financial condition and ability to develop drug candidates.

The pharmaceutical market is intensely competitive. If we are unable to compete effectively with existing drugs, new treatment methods and new technologies, we may be unable to commercialize successfully any drugs that we develop.

The pharmaceutical market is intensely competitive and rapidly changing. Many large pharmaceutical and biotechnology companies, academic institutions, governmental agencies and other public and private research organizations are pursuing the development of novel drugs for the same diseases that we are targeting or expect to target. Many of our competitors have:

- much greater financial, technical and human resources than we have at every stage of the discovery, development, manufacture and commercialization of products;
- more extensive experience in pre-clinical testing, conducting clinical trials, obtaining regulatory approvals, and in manufacturing, marketing and selling pharmaceutical products;
- product candidates that are based on previously tested or accepted technologies;

- products that have been approved or are in late stages of development; and
- collaborative arrangements in our target markets with leading companies and research institutions.

Products based on our technologies may face intense competition from drugs that have already been approved and accepted by the medical community for the treatment of the conditions for which we may develop drugs. We also expect to face competition from new drugs that enter the market. We believe a significant number of drugs are currently under development, and may become commercially available in the future, for the treatment of conditions for which we and our partners may try to develop drugs. These drugs may be more effective, safer, less expensive, or marketed and sold more effectively, than any products we and our partners develop.

If we and our partners successfully develop product candidates based on our technologies, and obtain approval for them, we will face competition based on many different factors, including:

- safety and effectiveness of such products;
- ease with which such products can be administered and the extent to which patients accept relatively new routes of administration;
- timing and scope of regulatory approvals for these products;
- availability and cost of manufacturing, marketing and sales capabilities;
- price;
- reimbursement coverage; and
- patent position.

Our competitors may develop or commercialize products with significant advantages over any products we develop based on any of the factors listed above or on other factors. Our competitors may therefore be more successful in commercializing their products than we are, which could adversely affect our competitive position and business. Competitive products may make any products we develop obsolete or noncompetitive before we can recover the expenses of developing and commercializing our product candidates. Such competitors could also recruit our future employees, which could negatively impact our level of expertise and the ability to execute on our business plan. Furthermore, we also face competition from existing and new treatment methods that reduce or eliminate the need for drugs, such as the use of advanced medical devices. The development of new medical devices or other treatment methods for the diseases we are targeting could make our product candidates noncompetitive, obsolete or uneconomical.

We may be unable to compete successfully against other companies that are working to develop novel drugs and technology platforms using technology similar to ours.

In addition to the competition we face from competing drugs in general, we also face competition from other biotechnology and pharmaceutical companies and medical institutions that are working to develop novel drugs using technology that competes more directly with our own. Among those companies that are working in this field are: Alnylam Pharmaceuticals, Arcturus, Benitec Biopharma, Dicerna Pharmaceuticals, Isis, miRagen Therapeutics, Mirna, PhaseRx Pharmaceuticals, Quark Pharmaceuticals, Regulus Therapeutics, Rxi Pharmaceuticals, Sarepta, Silence Therapeutics and Tekmira. Any of these companies may develop its technology more rapidly and more effectively than us.

In addition to competition with respect to our technology and with respect to specific products, we and our partners face substantial competition to discover and develop safe and effective means to deliver the drugs based on our technologies that are developed to the relevant cell and tissue types. Substantial resources are being expended by third parties, both in academic laboratories and in the corporate sector, in the effort to discover and develop a safe and effective means of delivery into the relevant cell and tissue types. If safe and effective means of delivery to the relevant cell and tissue types were developed by our competitors, our ability to successfully commercialize a competitive product would be adversely affected.

Many of our competitors, either alone or together with their partners, have substantially greater R&D capabilities and financial, scientific, technical, manufacturing, sales, marketing, distribution, regulatory and other resources and experience than us. They may also have more established relationships with pharmaceutical companies. Even if we and and/or our partners are successful in developing products based on our technologies, in order to compete successfully we may need to be first to obtain IP protection for, or to commercialize, such products, or we may need to demonstrate that such products are superior to, or more cost effective than, products developed by our competitors (including therapies that are based on different technologies). If we are not first to protect or market our products, or if we are unable to differentiate our products from those offered by our competitors, any products for which we are able to obtain approval may not be successful.

Universities and public and private research institutions are also potential competitors. While these organizations primarily have educational objectives, they may develop proprietary technologies related to the drug delivery field or secure protection that we may need for development of our technologies and products. We may attempt to license one or more of these proprietary technologies, but these licenses may not be available to us on acceptable terms, if at all.

RISKS RELATED TO OUR COMMON STOCK

The trading price of our common stock has been volatile, and investors in our common stock may experience substantial losses.

The trading price of our common stock has been volatile and may become volatile again in the future. The trading price of our common stock could decline or fluctuate in response to a variety of factors, including:

- our general financial condition and ability to maintain sufficient capital to continue operations;
- our ability to enter into and maintain collaborative arrangements with third parties;
- our ability to meet the performance estimates of securities analysts;
- changes in buy/sell recommendations by securities analysts;
- negative results from clinical and pre-clinical trials;
- fluctuation in our quarterly operating results;
- reverse splits or increases in authorized shares;
- substantial sales of our common stock;
- general stock market conditions; or
- other economic or external factors.

The stock markets in general, and the markets for the securities of companies in our industry in particular, have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our common stock.

We may not be able to consistently satisfy our reporting obligations under the Securities Exchange Act of 1934, and may be subject to penalties as a result of such failure.

Prior to the filing of our Annual Report on Form 10-K for the fiscal year ended December 31, 2012, which we filed on July 22, 2014, we did not file with the Securities and Exchange Commission any of the quarterly or annual reports that we are required to file pursuant to Section 13 of the Exchange Act since the filing of our Quarterly Report on Form 10-Q for the quarterly period ending on September 30, 2012, which we filed on December 5, 2012. Any future failure to satisfy our filing requirements under the Exchange Act in a timely manner could result in the suspension of trading in our common stock, either on a temporary or a permanent basis, as well as other penalties that may be imposed by the Commission.

We may not be able to achieve secondary trading of our stock in certain states because our common stock is not nationally traded.

Because our common stock is not listed for trading on a national securities exchange, our common stock is subject to the securities laws of the various states and jurisdictions of the U.S. in addition to federal securities law. This regulation covers any primary offering we might attempt and all secondary trading by our stockholders. If we fail to take appropriate steps to register our common stock or qualify for exemptions for our common stock in certain states or jurisdictions of the U.S., the investors in those jurisdictions where we have not taken such steps may not be allowed to purchase our stock or those who presently hold our stock may not be able to resell their shares without substantial effort and expense. These restrictions and potential costs could be significant burdens on our stockholders.

Our common stock is traded on the OTCQB, which may limit the ability of our stockholders to sell their securities, and may cause volatility in the price of our common stock.

Our common stock currently trades on the OTCQB. Securities trading on the OTCQB tier of the OTC Markets often experience a lack of liquidity as compared to securities trading on a national securities exchange. Such securities also have experienced extreme price and volume fluctuations in recent years, which have particularly affected the market prices of many smaller companies like ours. We anticipate that our common stock will be subject to the lack of liquidity and this volume and price volatility that is characteristic of the OTCQB.

Our common stock may be considered a "penny stock," and thereby be subject to additional sale and trading regulations that may make it more difficult to sell.

Our common stock may be considered to be a "penny stock" if it does not qualify for one of the exemptions from the definition of "penny stock" under Section 3a51-1 of the Exchange Act. The principal result or effect of being designated a "penny stock" is that securities broker-dealers participating in sales of our common stock will be subject to the "penny stock" regulations set forth in Rules 15-2 through 15g-9 promulgated under the Exchange Act. For example, Rule 15g-2 requires broker-dealers dealing in penny stocks to provide potential investors with a document disclosing the risks of penny stocks and to obtain a manually signed and dated written receipt of the document at least two business days before effecting any transaction in a penny stock for the investor's account.

Moreover, Rule 15g-9 requires broker-dealers in penny stocks to approve the account of any investor for transactions in such stocks before selling any penny stock to that investor. This procedure requires the broker-dealer to (i) obtain from the investor information concerning his or her financial situation, investment experience and investment objectives; (ii) reasonably determine, based on that information, that transactions in penny stocks are suitable for the investor and that the investor has sufficient knowledge and experience as to be reasonably capable of evaluating the risks of penny stock transactions; (iii) provide the investor with a written statement setting forth the basis on which the broker-dealer made the determination in (ii) above; and (iv) receive a signed and dated copy of such statement from the investor, confirming that it accurately reflects the investor's financial situation, investment experience and investment objectives. Compliance with these requirements may make it more difficult and time consuming for holders of our common stock to resell their shares to third parties or to otherwise dispose of them in the market or otherwise.

Various restrictions in our charter documents and Delaware law could prevent or delay a change in control of us that is not supported by our board of directors.

We are subject to a number of provisions in our charter documents and Delaware law that may discourage, delay or prevent a merger, acquisition or change of control that a stockholder may consider favorable. These anti-takeover provisions include:

- advance notice procedures for nominations of candidates for election as directors and for stockholder proposals to be considered at stockholders' meetings; and
- the Delaware anti-takeover statute contained in Section 203 of the Delaware General Corporation Law.

Section 203 of the Delaware General Corporation Law prohibits a merger, consolidation, asset sale or other similar business combination between us and any stockholder of 15% or more of our voting stock for a period of three years after the stockholder acquires 15% or more of our voting stock, unless (1) the transaction is approved by our board of directors before the stockholder acquires 15% or more of our voting stock, (2) upon completing the transaction the stockholder owns at least 85% of our voting stock outstanding at the commencement of the transaction, or (3) the transaction is approved by our board of directors and the holders of 66 2/3% of our voting stock, excluding shares of our voting stock owned by the stockholder.

We have never paid dividends on our common stock and do not anticipate paying cash dividends in the foreseeable future.

We have not paid any dividends on our common stock and do not expect to do so in the foreseeable future. In addition, the terms of any financing arrangements that we may enter into may restrict our ability to pay any dividends.

A significant number of shares of our common stock are subject to options, warrants and conversion rights, and we expect to sell additional shares of our common stock in the future. The issuance of these shares — which may occur on a cashless basis — will dilute the interests of other security holders and may depress the price of our common stock.

At February 17, 2015, there were outstanding warrants to purchase up to approximately 21.2 million shares of common stock, with approximately 20.8 million of such warrants having an exercise price of less than $1.00. If any of these warrants are exercised on a cashless basis, we will not receive any cash as a result of such exercises. At February 17, 2015, there were also outstanding 1,200 shares of Series C Convertible Preferred Stock, which shares are convertible into 8.0 million shares of common stock at an assumed conversion price of $0.75 per share of common stock. In addition, we may issue a significant number of additional shares of common stock (and securities convertible into or exercisable for common stock) from time to time to finance our operations, to fund potential acquisitions, or in connection with additional stock options or restricted stock granted to our employees, officers, directors and consultants. The issuance of common stock (or securities convertible into or exercisable for common stock), and the exercise or conversion of securities exercisable for or convertible into common stock, will have a dilutive impact on other stockholders and could have a material negative effect on the market price of our common stock.

There are outstanding a significant number of shares available for future sales under Rule 144.

A significant number of shares of our common stock, including shares of common stock that have been issued to our former landlord and certain of our vendors to settle outstanding obligations, and shares of our common stock that may be issuable upon the cashless exercise of outstanding "in-the-money" warrants, may be deemed "restricted shares" and, in the future, may be sold in compliance with Rule 144 promulgated under the Securities Act. Any sales of such shares of our common stock under Rule 144 could have a depressive effect on the market price of our common stock. In general, under Rule 144, a person (or persons whose shares are aggregated) who is not deemed to have been an affiliate of ours at any time during the three months preceding a sale, and who has beneficially owned restricted securities within the meaning of Rule 144 for at least six months (including any period of consecutive ownership of preceding non-affiliated holders) would be entitled to sell those shares, subject only to the availability of current public information about us. A non-affiliated person who has beneficially owned restricted securities within the meaning of Rule 144 for at least one year would be entitled to sell those shares without regard to the provisions of Rule 144. A person who is deemed to be an affiliate of ours and who has beneficially owned restricted securities within the meaning of Rule 144 for at least six months would be entitled to sell within any three-month period a number of shares that does not exceed the greater of one percent of the then outstanding shares of our common stock or the average weekly trading volume of our common stock during the four calendar weeks preceding such sale. Such sales are also subject to certain manner of sale provisions, notice requirements and the availability of current public information about us.

Our Board of Directors has the ability to issue "blank check" Preferred Stock.

Our Certificate of Incorporation authorizes the issuance of up to 100,000 shares of "blank check" preferred stock, with such designation rights and preferences as may be determined from time to time by

our Board of Directors. At February 17, 2015, 90,000 shares had been designated as Series A Junior participating preferred stock and 1,000 shares had been designated as Series B Preferred Stock, none of which are issued and outstanding. Also at February 17, 2015, 1,200 shares had been designated as Series C Convertible Preferred Stock, all of which are issued and outstanding. Our Board is empowered, without shareholder approval, to issue shares of preferred stock with dividend, liquidation, conversion, voting or other rights which could adversely affect the voting power or other rights of the holders of our common stock. In the event of such issuances, the preferred stock could be utilized, under certain circumstances, as a method of discouraging, delaying or preventing a change in control of our company. Although we have no present intention to issue any additional shares of our preferred stock, there can be no assurance that we will not do so in the future.

ITEM 1B. ***Unresolved Staff Comments.***

Not applicable.

ITEM 2. ***Properties.***

We do not own or lease any real property or facilities that are material to our business operations. As we seek to restart our business operations, we plan to lease facilities in order to support our development, operational, and administrative needs under our current operating plan. There can be no assurance that such facilities will be available, or that they will be available on suitable terms. Our inability to obtain such facilities will have a material adverse effect on our future plans and operations.

ITEM 3. ***Legal Proceedings.***

We are subject to various legal proceedings and claims that arise in the ordinary course of business. Our management currently believes that resolution of such legal matters will not have a material adverse impact on our financial position, results of operations or cash flows.

ITEM 4. ***Mine Safety Disclosures.***

Not applicable.

PART II

ITEM 5. ***Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.***

MARKET INFORMATION

Our common stock has traded on the OTCQB under the symbol "MRNA" since September 17, 2014. Previously, our common stock traded on the OTC Pink under the symbol "MRNA" from July 11, 2012 until September 16, 2014. The table below sets forth, for each of the quarterly periods indicated, the range of high and low bid prices of our common stock, as reported by the OTC Markets. The prices reflect inter-dealer prices, without retail mark-up, mark-down or commission, and may not represent actual transactions.

	High	Low
Fiscal 2013:		
First Quarter	$0.50	$0.22
Second Quarter	0.32	0.18
Third Quarter	0.31	0.22
Fourth Quarter	0.49	0.19
Fiscal 2014:		
First Quarter	$1.81	$0.39
Second Quarter	1.23	0.55
Third Quarter	1.30	0.48
Fourth Quarter	1.10	0.55
Fiscal 2015:		
First Quarter (through February 13, 2015)	$0.80	$0.56

On February 13, 2015, the closing price of our common stock reported by the OTC Markets was $0.59 per share.

Holders

As of August 7, 2014, there were approximately 11,055 beneficial holders of record of our common stock.

Dividends

Payment of dividends and the amount of dividends depend on matters deemed relevant by our Board, such as our results of operations, financial condition, cash requirements, future prospects and any limitations imposed by law, credit agreements and debt securities. To date, we have not paid any cash dividends or stock dividends on our common stock. In addition, we currently anticipate that we will not pay any cash dividends in the foreseeable future. Furthermore, the terms of any financing arrangements that we may enter into may restrict our ability to pay any dividends.

ITEM 6. ***Selected Financial Data.***

Not applicable.

ITEM 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations.*

OVERVIEW

The following Management's Discussion and Analysis of Financial Condition and Results of Operations is intended to provide information necessary to understand our audited consolidated financial statements for the two-year period ended December 31, 2014 and highlight certain other information which, in the opinion of management, will enhance a reader's understanding of our financial condition, changes in financial condition and results of operations. In particular, the discussion is intended to provide an analysis of significant trends and material changes in our financial position and the operating results of our business during the year ended December 31, 2014, as compared to the year ended December 31, 2013. This discussion should be read in conjunction with our consolidated financial statements for the two-year period ended December 31, 2014 and related notes included elsewhere in this annual report on Form 10-K. These historical financial statements may not be indicative of our future performance. This Management's Discussion and Analysis of Financial Condition and Results of Operations contains a number of forward-looking statements, all of which are based on our current expectations and could be affected by the uncertainties and risks described throughout this filing, particularly in "Item 1A. Risk Factors."

This Item is organized as follows:

- "Background" describes our principal operational activities and summarizes significant trends and developments in our business and in our industry.
- "Cash Position and Liquidity" discusses liquidity considerations.
- "Critical Accounting Policies and Estimates" discusses our most critical accounting policies and estimates.
- "Consolidated Results of Operations" discusses the primary factors that contributed to significant variability of our results of operations for 2014 as compared to 2013.
- "Off-Balance Sheet Arrangements" indicates that we did not have any off-balance sheet arrangements as of December 31, 2014.

BACKGROUND

We are a biotechnology company focused on the discovery, development and commercialization of nucleic acid-based therapies to treat orphan diseases. Our pipeline includes CEQ508, a product in clinical development for the treatment of Familial Adenomatous Polyposis ("FAP"), for which we have received Orphan Drug Designation ("ODD") from the U.S. Food and Drug Administration ("FDA"), and preclinical programs for the treatment of type 1 myotonic dystrophy ("DM1") and Duchenne muscular dystrophy ("DMD"). We will need additional capital in order to execute on our strategy to initiate the registration trial for and to commercialize CEQ508, and to file Investigational New Drug ("IND") applications for both DM1 and DMD and to bring these two programs to human proof-of-concept. We are currently pursuing both non-dilutive means of obtaining such capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining such capital, primarily through the offering of our equity and debt securities.

Since 2010, we have strategically acquired/in-licensed and further developed nucleic acid chemistry and delivery-related technologies in order to establish a novel and differentiated drug discovery platform. This platform allows us to distinguish ourselves from others in the nucleic acid therapeutics area in that we are the only company capable of creating a wide variety of therapeutics targeting coding and non-coding RNA via multiple mechanisms of action such as RNA interference ("RNAi"), messenger RNA translational inhibition, exon skipping, microRNA ("miRNA") replacement, miRNA inhibition, and steric blocking in order to modulate gene expression either up or down depending on the specific mechanism of action. Our goal is to dramatically improve the lives of the patients and families affected by orphan diseases through either our own efforts or those of our collaborators and licensees.

Our business strategy is two-fold:

Our strategy is to discover and develop our own pipeline of nucleic acid-based compounds in order to commercialize drug therapies to treat orphan diseases. Our lead effort is the clinical development of CEQ508 to treat FAP, a rare disease for which CEQ508 received ODD from the FDA in 2010. Currently, there is no approved therapeutic for the treatment of FAP. In April 2012, we announced the completion of dosing for Cohort 2 in the Dose Escalation Phase of the START-FAP (Safety and Tolerability of An RNAi Therapeutic in FAP) Phase 1b/2a clinical trial. Based on our financial situation and the stability of existing clinical trial material, we have decided to take advantage of this break in the clinical program to optimize the manufacturing process and produce new clinical trial material. We expect to dose Cohort 3 in the fourth quarter of 2015. In addition, we expect to advance pre-clinical programs in DM1 and DMD through to human proof-of-concept.

We also seek to establish collaborations and strategic partnerships with pharmaceutical and biotechnology companies to generate revenue through up-front, milestone and royalty payments related to our technology and/or the products that are developed using such technology.

We believe we have created a unique industry-leading nucleic acid-based drug discovery platform, which is protected by a strong intellectual property ("IP") position and validated through: (1) licensing agreements for our SMARTICLES-based liposomal delivery technology ("SMARTICLES") with Mirna Therapeutics, Inc. ("Mirna"), ProNAi Therapeutics, Inc. ("ProNAi") and MiNA Therapeutics, Ltd. ("MiNA") for unique nucleic acid payloads — microRNA mimics, DNA interference oligonucleotides and small-activating RNA, respectively; (2) Mirna and ProNAi's respective clinical experience with SMARTICLES; (3) a licensing agreement with Novartis Institutes for Biomedical Research, Inc. ("Novartis") for our conformationally restricted nucleotide ("CRN") technology; (4) a licensing agreement with Protiva Biotherapeutics, Inc. ("Tekmira"), a wholly-owned subsidiary of Tekmira Pharmaceuticals Corporation, for our Unlocked Nucleobase Analog ("UNA") technology; (5) licensing agreements with two large international companies (i.e., Novartis and Monsanto Company ("Monsanto")) for certain chemistry and delivery technologies; and (6) our own FAP Phase 1b/2a clinical trial with the *TransKingdom* RNA™ interference ("*tk*RNAi") platform.

CASH POSITION AND LIQUIDITY

Liquidity

The accompanying consolidated financial statements have been prepared on the basis that we will continue as a going concern, which contemplates realization of assets and the satisfaction of liabilities in the normal course of business. At December 31, 2014, we had an accumulated deficit of approximately $337.8 million, $112.1 million of which has been accumulated since the corporation focused on RNA therapeutics in June 2008. To the extent that sufficient funding is available, we will in the future continue to incur losses as we continue our research and development ("R&D") activities. In addition, we have had and will continue to have negative cash flows from operations. We have funded our losses primarily through the sale of common and preferred stock and warrants, revenue provided from our license agreements with other parties, and, to a lesser extent, equipment financing facilities and secured loans. In 2014, we funded operations with a combination of issuances of preferred equity and license-related revenues. At December 31, 2014, we had a working capital surplus of $0.6 million, a stockholders' deficit of $4.4 million and $1.8 million in cash. Our resumed operating activities consumed the majority of our cash resources during 2014.

We have experienced and continue to experience operating losses and negative cash flows from operations, as well as an ongoing requirement for substantial additional capital investments. We believe that our current cash resources, which include an upfront licensing fee received from MiNA in January 2015, will enable us to fund our intended operations through July 2015.

The volatility in our stock price, as well as market conditions in general, could make it difficult for us to raise capital on favorable terms, or at all. If we fail to obtain additional capital when required, we may have to modify, delay or abandon some or all of our planned activities, or terminate our operations. These factors, among others, raise substantial doubt about our ability to continue as a going concern.

The accompanying consolidated financial statements do not include any adjustments that may result from the outcome of this uncertainty. We are currently pursuing both non-dilutive means of obtaining additional capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining additional capital, primarily through the offering of our equity and debt securities. However, there can be no assurance that we will be successful in such endeavors.

2014 Funding of Operations

Notes and Price Adjustable Warrants

In February 2012, we received net proceeds of approximately $1.5 million from the issuance of 15% secured promissory notes (the "Notes") and price adjustable warrants to purchase up to 3.7 million shares of our common stock. Through a series of note amendments in 2012 and 2013, we issued additional price adjustable warrants to purchase 8.2 million shares of our common stock, all of which had an exercise price of $0.28 at December 31, 2013. These price adjustable warrants expire between August 2017 and April 2018.

In February 2013, an amendment was executed that extended the maturity date of the Notes to the end of April 2013 and retained all of the terms of the Notes as amended in 2012. For consideration of this amendment, we issued additional warrants to purchase up to 1.0 million shares at a price of $0.28, such price being downward adjustable, including as a result of subsequent financings. The final amendment, executed in August 2013, extended the maturity date of the Notes to March 2014 and replaced the previously amended features and terms of the Notes with a limited claim on cash received as a result of financings or license payments and the balance of principal and accrued interest convertible to financing securities at the effective price paid for the securities by other parties.

Debt Conversion, Series C Convertible Preferred Stock and Warrants

In February 2014, the holders of the Notes exchanged the Notes for 2.0 million shares of our common stock. In addition, in March 2014, we entered into a Securities Purchase Agreement with certain investors pursuant to which we sold 1,200 shares of our Series C Convertible Preferred Stock ("Series C Preferred") and warrants to purchase up to 6.0 million shares of our common stock at an exercise price of $0.75 per share, for an aggregate purchase price of $6.0 million. Each share of Series C Stock has a stated value of $5,000 per share and is convertible into shares of common stock at a conversion price of $0.75 per dollar of stated value. The Series C Preferred Stock is initially convertible into 8.0 million shares of our common stock, subject to certain limitations and adjustments.

Licensing Payments

During 2014, we recorded an account receivable of $0.5 million for an upfront license payment from MiNA related to a license agreement executed in December 2014. We received payment in January 2015.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Principles of Consolidation — We consolidate our financial statements with our wholly-owned subsidiaries, Cequent, MDRNA and Atossa, and eliminate any inter-company balances and transactions.

Use of Estimates — The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires our management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and reported amounts of revenues and expenses during the reporting periods. Estimates having relatively higher significance include revenue recognition, R&D costs, stock-based compensation, valuation of warrants, valuation and estimated lives of identifiable intangible assets, impairment of long-lived assets, valuation of features embedded within note agreements and amendments, and income taxes. Actual results could differ from those estimates.

Fair Value of Financial Instruments — We consider the fair value of cash, restricted cash, accounts receivable, accounts payable and accrued liabilities not to be materially different from their carrying value. These financial instruments have short-term maturities. We follow authoritative guidance with respect to

fair value reporting issued by the Financial Accounting Standards Board ("FASB") for financial assets and liabilities, which defines fair value, provides guidance for measuring fair value and requires certain disclosures. The guidance does not apply to measurements related to share-based payments. The guidance discusses valuation techniques, such as the market approach (comparable market prices), the income approach (present value of future income or cash flow), and the cost approach (cost to replace the service capacity of an asset or replacement cost). The guidance establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. The following is a brief description of those three levels:

Level 1: Observable inputs such as quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3: Unobservable inputs in which little or no market data exists, therefore developed using estimates and assumptions developed by us, which reflect those that a market participant would use.

Our cash is subject to fair value measurement and is valued determined by Level 1 inputs. We measure the liability for committed stock issuances with a fixed share number using Level 1 inputs. We measure the liability for price adjustable warrants and certain features embedded in notes, using the Black-Scholes-Merton valuation model ("Black-Scholes"), using Level 3 inputs.

Our determination of the fair value of price adjustable securities as of the reporting date is affected by our stock price as well as assumptions regarding a number of highly complex and subjective variables. These variables include, but are not limited to, expected stock price volatility over the term of the security, the risk-free interest rate, the likelihood of financing at a range of prices, the likelihood of the sale of our company at a range of prices, and the likelihood of insolvency. Other reasonable assumptions for these variables could provide differing results. In addition, Black-Scholes requires the input of an expected life for the securities for which we have used the remaining contractual life. The fair value liability is revalued each balance sheet date utilizing Black-Scholes with the decrease or increase in fair value being reported in the statement of operations as other income or expense, respectively. The primary factor affecting the fair value liability is our stock price.

The following illustrates the effect that reasonably likely changes in our stock price would have on the estimated fair value liability for price adjustable securities that were outstanding as of December 31, 2014.

	- 10% change in stock price	Weighted average variables used in valuation at December 31, 2014	+ 10% change in stock price
Effect of a 10% change in stock price			
Condition changed			
Stock price	$ 0.59	$ 0.66	$ 0.73
Assumptions and conditions held constant			
Exercise price	$ 0.42	$ 0.42	$ 0.42
Expected life in years	3.52	3.52	3.52
Risk free rate	0.90%	0.90%	0.90%
Expected stock volatility	121%	121%	121%
Estimated fair value liability for price adjustable securities (in thousands)	$8,044	$9,225	$10,429

In December 2014, we pledged to issue common stock valued at $0.075 million to Novosom, related to our license agreement with MiNA, for the portion due under its sublicensing agreement. Pricing of the common stock was to occur on receipt of the payment from MiNA. As of December 2014, the pledge was issued as a dollar denominated liability and was not influenced by changes in stock price. This obligation is included in Fair Value of Stock to be Issued to Settle Liabilities at December 31, 2014.

Our reported net loss was $6.5 million for 2014. A 10% change in the stock price results in a change of $1.2 million in our net loss. If our December 31, 2014 closing stock price had been 10% lower, our net loss would have been $5.3 million. If our December 31, 2014 closing stock price had been 10% higher, our net loss would have been $7.7 million.

The following illustrates the effect of changing the volatility assumptions on the estimated fair value liability for price adjustable securities that were outstanding at December 31, 2014:

	- 10% change in Expected Stock Volatility	Weighted average variables used in valuation at December 31, 2014	+ 10% change in Expected Stock Volatility
Effect of a 10% change in volatility			
Condition changed			
Expected stock volatility	109%	121%	133%
Assumptions and conditions held constant			
Exercise price	$ 0.42	$ 0.42	$ 0.42
Expected life in years	3.52	3.52	3.52
Risk free rate	0.90%	0.90%	0.90%
Stock Price	$ 0.66	$ 0.66	$ 0.66
Estimated fair value liability for price adjustable securities (in thousands)	$8,829	$9,225	$9,588

A 10% reduction in volatility assumptions would reduce our net loss by $0.4 million to $6.1 million. A 10% increase in volatility assumptions would increase our net loss by $0.4 million to $6.9 million.

Identifiable intangible assets — Intangible assets associated with in-process R&D ("IPR&D") acquired in business combinations are not amortized until approval is obtained in the United States, the European Union, or in a series of other countries, subject to certain specified conditions and management judgment. The useful life of an amortizing asset generally is determined by identifying the period in which substantially all of the cash flows are expected to be generated.

Accrued Restructuring — During 2011 and 2012, we ceased operating leased facilities in Bothell, Washington and recorded an accrued liability for remaining lease termination costs at fair value, based on the remaining payments due under the lease and other costs. In 2013, final payments were made to the landlord.

Impairment of long-lived assets — We review all of our long-lived assets for impairment indicators throughout the year and perform detailed testing whenever impairment indicators are present. In addition, we perform detailed impairment testing for indefinite-lived intangible assets, specifically IPR&D, at least annually at December 31. When necessary, we record charges for impairments. Specifically:

- For finite-lived intangible assets, such as developed technology rights, and for other long-lived assets, such as property and equipment, we compare the undiscounted amount of the projected cash flows associated with the asset, or asset group, to the carrying amount. If the carrying amount is found to be greater, we record an impairment loss for the excess of book value over fair value. In addition, in all cases of an impairment review, we re-evaluate the remaining useful lives of the assets and modify them, as appropriate; and
- For indefinite-lived intangible assets, such as IPR&D assets, each year and whenever impairment indicators are present, we determine the fair value of the asset and record an impairment loss for the excess of book value over fair value, if any.

Notes Payable — Notes payable are recorded under liabilities, classified into short and long term, depending on the principal due in the subsequent twelve months. Interest is either accrued or paid according to the terms of the notes. Costs associated with the issuance of debt, such as legal fees, are recorded as prepaid expenses and are amortized on a straight-line basis over the period to maturity of the debt.

Note amendments and changes must be analyzed for correct accounting application based on our financial condition and the changes in the debt instrument features and terms. For each note amendment, a series of analyses is performed to determine first whether the amendment was a troubled debt restructuring ("TDR"), as defined by conditions of default, our financial state and ability to repay loan, and whether the lender made a concession. If an amendment is not a TDR, then we perform a further analysis to determine if the amended terms are "substantially different" from the existing debt facility. The debt is considered extinguished if the present value of the cash flows under the terms of the new debt instrument is at least 10 percent different from the present value of the remaining cash flows under the terms of the original instrument. The new debt instrument is initially recorded at fair value, and that amount is used to determine the debt extinguishment gain or loss recognized and the effective rate of the new instrument. If it is determined that the original and new debt instruments are not substantially different, then a new effective interest rate is determined based on the carrying amount of the original debt instrument resulting from the modification, and the revised cash flows. If the exchange or modification is to be accounted for in the same manner as a debt extinguishment and the new debt instrument is initially recorded at fair value, then the fees paid including the fair value of warrants issued are included in the debt extinguishment gain or loss. If the exchange or modification is not to be accounted for in the same manner as a debt extinguishment, then the fees paid including the fair value of warrants issued are amortized as an adjustment of interest expense over the remaining term of the replacement or modified debt instrument using the interest method.

Revenue Recognition — Revenue is recognized when persuasive evidence that an arrangement exists, delivery has occurred, collectability is reasonably assured, and fees are fixed or determinable. Deferred revenue expected to be recognized within the next 12 months is classified as current. Substantially all of our revenues are generated from licensing arrangements that do not involve multiple deliverables and have no ongoing influence, control or R&D obligations. Our license arrangements may include upfront non-refundable payments, development milestone payments, patent-based or product sale royalties, and commercial sales, all of which are treated as separate units of accounting. In addition, we may receive revenues from sub-licensing arrangements. For each separate unit of accounting, we have determined that the delivered item has value to the other party on a stand-alone basis, we have objective and reliable evidence of fair value using available internal evidence for the undelivered item(s) and our arrangements generally do not contain a general right of return relative to the delivered item.

Revenue from licensing arrangements is recorded when earned based on the specific terms of the contracts. Upfront non-refundable payments, where we are not providing any continuing services as in the case of a license to our IP, are recognized when the license becomes available to the other party.

Milestone payments typically represent nonrefundable payments to be received in conjunction with the uncertain achievement of a specific event identified in the contract, such as initiation or completion of specified development activities or specific regulatory actions such as the filing of an IND. We believe a milestone payment represents the culmination of a distinct earnings process when it is not associated with ongoing research, development or other performance on our part and it is substantive in nature. We recognize such milestone payments as revenue when it becomes due and collection is reasonably assured.

Royalty and earn-out payment revenues are generally recognized upon commercial product sales by the licensee as reported by the licensee.

Stock-based Compensation — We use Black-Scholes as our method of valuation for stock-based awards. Stock-based compensation expense is based on the value of the portion of the stock-based award that will vest during the period, adjusted for expected forfeitures. The estimation of stock-based awards that will ultimately vest requires judgment, and to the extent actual or updated results differ from our current estimates, such amounts will be recorded in the period the estimates are revised. Black-Scholes requires the input of highly subjective assumptions, and other reasonable assumptions could provide differing results. Our determination of the fair value of stock-based awards on the date of grant using an option pricing model is affected by our stock price as well as assumptions regarding a number of highly complex and subjective variables. These variables include, but are not limited to, the expected life of the award and expected stock price volatility over the term of the award. Stock-based compensation expense is recognized immediately for immediately vested portions of the grant, with the remaining portions recognized on a straight-line basis over the applicable vesting periods based on the fair value of such stock-based awards on

the grant date. Forfeiture rates have been estimated based on historical rates and compensation expense is adjusted for general forfeiture rates in each period. Starting in September 2014, we did not use historical forfeiture rates and did not apply a forfeiture rate as the historical forfeiture rate was not believed to be a reasonable estimate of the probability that the outstanding awards would be exercised in the future and the company believes it is probable that the full awards will be exercised in the future.

Non-employee stock compensation expense is recognized immediately for immediately vested portions of the grant, with the remaining portions recognized on a straight-line basis over the applicable vesting periods. At the end of each financial reporting period prior to vesting, the value of the unvested stock options, as calculated using a Black-Scholes model, is re-measured using the fair value of our common stock and the stock-based compensation recognized during the period is adjusted accordingly.

Income Taxes — Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of assets and liabilities and their respective tax bases and operating loss and tax credit carry-forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in years in which those temporary differences are expected to be recovered or pledged. The effect on deferred tax assets and liabilities of a change in tax rates in recognized in income in the period that includes the enactment date. Tax benefits in excess of stock-based compensation expense recorded for financial reporting purposes relating to stock-based awards will be credited to additional paid-in capital in the period the related tax deductions are realized. Our policy for recording interest and penalties associated with audits is to record such items as a component of loss before taxes.

We assess the likelihood that our deferred tax assets will be recovered from existing deferred tax liabilities or future taxable income. Factors we considered in making such an assessment include, but are not limited to, estimated utilization limitations of operating loss and tax credit carry-forwards, expected reversals of deferred tax liabilities, past performance, including our history of operating results, our recent history of generating tax losses, our history of recovering net operating loss carry-forwards for tax purposes and our expectation of future taxable income. We recognize a valuation allowance to reduce such deferred tax assets to amounts that are more likely than not to be ultimately realized. To the extent that we establish a valuation allowance or change this allowance, we would recognize a tax provision or benefit in the consolidated statements of operations. We use our judgment to determine estimates associated with the calculation of our provision or benefit for income taxes and in our evaluation of the need for a valuation allowance recorded against our net deferred tax assets.

CONSOLIDATED RESULTS OF OPERATIONS

Comparison of Annual Results of Operations

MARINA BIOTECH, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except shares and percentages)	Year Ended December 31, 2013	Year Ended December 31, 2014	Change $	Change %
License and other revenue	$ 2,115	$ 500	$ (1,615)	(76)%
Operating expenses:				
Research and development	715	686	(29)	(4)%
General and administrative	1,765	3,334	1,569	89%
Total operating expenses	2,480	4,020	1,540	62%
Loss from operations	(365)	(3,520)	(3,155)	864%
Other income (expense):				
Interest and other expense	(249)	(1,006)	(757)	304%
Change in fair value liability for price adjustable warrants	151	13	(138)	(91)%
Change in fair value of stock reserved for issuance to settle liabilities	31	(2,503)	(2,534)	*
Change in fair value of embedded features in notes payable and amendments to notes payable	829	—	(829)	*
Loss on debt extinguishment	(2,037)	5	2,042	100%
Gain on equipment disposal	30	—	(30)	*
Gain on settled liabilities	—	534	534	*
Total other expense, net	(1,245)	(2,957)	(1,712)	138%
Net loss before income tax	(1,610)	(6,477)	(4,867)	302%
Income tax benefit	(39)	—	39	*
Net loss	$ (1,571)	$ (6,477)	$ (4,906)	312%
Net loss per common share – basic and diluted	$ (0.09)	$ (0.26)	$ (0.17)	184%
Shares used in computing net loss per share – basic and diluted	16,937,661	24,634,535		

* Change not meaningful.

Comparison of Fiscal Year 2013 and Fiscal Year 2014

Revenue. We recorded $0.5 million in license related revenue in 2014, all from MiNA. In 2013, we received license related revenue of $0.2 million from Tekmira, $0.8 million from Arcturus, and $1.0 million from Mirna. Additionally, we recognized $0.1 million of deferred revenue on completion of service obligations to Mirna and sold $0.03 million of reagents to Novartis. The majority of these licensing deals provide for clinical and regulatory milestones, though the achievement of any such milestones and the realization of any revenues relating thereto is uncertain. We will seek R&D collaborations, as well as licensing transactions to fund business operations.

Research and Development. R&D expense consists primarily of salaries and other personnel-related expenses, costs of clinical development and pre-clinical studies, consulting and other outside services, laboratory supplies, patent license fees, and other costs. R&D expenses decreased 4% from $0.72 million in 2013 to $0.69 million, predominantly due to:

- Personnel-related expenses (compensation, benefits, travel related) decreased by 100% from $0.4 million to $0 due to the elimination of all R&D company employees. Consulting fees and outside services expenses increased from an immaterial amount in 2013 to $0.41 million in 2014. The net difference between 2013 employee expenses and 2014 consulting expenses is immaterial;
- Resumption of the scientific advisory board compensation expense in 2014 added $0.05 million in expense, compared to $0 in 2013;
- Resumption of clinical development expense in 2014 added $0.06 million in expense compared to $0 in 2013; and
- Cost associated with license agreements decreased 50% from $0.30 million in 2013 to $0.15 million in 2014, due to activity in out-licensing arrangements involving technologies we sublicensed from a third party.

General and administrative. General and administrative ("G&A") expense consists primarily of salaries and other personnel-related expenses, stock-based compensation for G&A personnel and non-employee members of our Board of Directors, professional fees (such as accounting and legal), and corporate insurance. G&A costs increased by 89% from $1.8 million to $3.3 million primarily due to:

- Personnel-related expenses (compensation, relocation, travel related) increased by 30% from $0.85 million to $1.1 million due to compensation, relocation, and travel expense increases related to our CEO;
- Costs of legal and accounting fees, consulting, corporate insurance and other administrative costs increased by 89% from $1.0 million to $1.9 million, predominantly due to increases in legal and patent, finance, public relations and web hosting, and fees associated with SEC filings and annual meeting hosting; and
- Resumption of the Board of Directors compensation expenses in 2014 added $0.13 million in expense compared to $0 in 2013.

Change in fair value liability for price adjustable securities. The fair value liability is revalued each balance sheet date utilizing Black-Scholes computations, with the decrease or increase in fair value being reported in the statement of operations as other income or expense, respectively. The change associated with this mark-to-fair value requirement declined 91% from a gain of $0.15 million in 2013 to a gain of $0.01 million in 2014. The largest factor of the change in the value of the liability is our stock price, which went from $0.43 as of December 31, 2012 to $0.40 as of December 31, 2013 to $0.66 as of December 31, 2014. A decrease in stock price during a period decreases the liability and increases our gain on the consolidated statements of operations. The other significant factor is the issuance of additional securities that require revaluation for reporting. In 2013, an additional 5.0 million warrants were issued and were subsequently re-valued based on stock price changes between the issuance date and December 31, 2014. Due to the multiple variables in the terms of the warrants associated with the Series C convertible preferred stock issuance, the warrants to purchase 6.0 million shares require revaluation and the decrease in the stock price between the warrant issuance and December 31, 2014 resulted in a gain that partially offset the revaluation loss.

Change in fair value liability for stock to be issued. In 2012, we had contractually pledged shares to vendors to settle accounts payable, to Novosom to settle amounts owed under our license agreement, and to our former landlord as part of a lease termination agreement. As these liabilities are denominated in shares, not value, they are required to be revalued for reporting. Share based liabilities were revalued at December 31, 2013 and the $0.03 million decrease in total liability was recorded as a gain on the consolidated statements of operations. In December 2013, we pledged an additional 0.5 million shares to Novosom in conjunction with our Mirna payment receipt. In 2014, all pre-existing share pledges were settled and the change in fair value between December 31, 2013 and the dates of such issuances resulted in a loss of $2.5 million for the year ended December 31, 2014. We additionally pledged $0.075 million of stock to be issued to Novosom in connection with the MiNA sublicense, but as this was dollar denominated, there were no changes in fair value between the date of the recorded liability and December 31, 2014.

Change in fair value of features embedded in notes payable. Certain features introduced within the notes payable and subsequent amendments are defined as separable units of accounting and represent stand-alone liabilities carried at fair value on the balance sheet. Such features include the right to convert at the note holders' discretion and conversion price protection in the event of a sale of the company at a significant discount. These features are revalued at each reporting period and the liability adjusted accordingly, with changes in the liability reflected as a gain or loss on the consolidated statements of operations. In 2013, the embedded liabilities were eliminated, resulting in a gain of $0.8 million on the consolidated statements of operations.

No embedded features remained in 2014.

Gain on settled liabilities. During 2012 and 2013, executives with contractual compensation obligations under employment agreements were paid only a portion of the obligation, with the remaining amount accrued for later payment. In January 2014, these accrued amounts were settled at a reduced rate and the gain arising from the discount amounted to $0.3 million. Additionally, in 2014, a number of vendor payables were settled for less than the accrued amount resulting in a net gain of $0.23 million.

Loss on debt extinguishment. Due to the requirements under debt extinguishment accounting, the fair value of the existing debt is extinguished on the date of the amendment. The warrants and the fair value of any embedded features within the notes are fully expensed as a gain or loss on extinguishment, then the note terms and features are revalued and rebooked on the balance sheet. In 2013, debt extinguishment resulted in a $2.0 million loss in connection with fair value expensing of warrants, offset by a gain of $0.8 million in connection with the elimination of the embedded features within the terms of the notes. The debt was converted to common shares in 2014, and the loss on debt extinguishment was immaterial.

Interest and other expense. In 2013, we recorded $0.2 million in interest on the notes payable. Interest expense in 2014 consisted of $0.03 million of interest on the notes and a $0.97 million charge related to the beneficial debt conversion feature that allowed conversion at $0.75 per share rather than at the prevailing market price.

Off-Balance Sheet Arrangements

At December 31, 2014, we did not have any off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

ITEM 7A. ***Quantitative and Qualitative Disclosures About Market Risk.***

Not applicable.

ITEM 8. ***Financial Statements and Supplementary Data.***

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Marina Biotech, Inc.:

We have audited the accompanying consolidated balance sheets of Marina Biotech, Inc. as of December 31, 2014 and 2013, and the related consolidated statements of operations, stockholders' deficit, and cash flows for the years then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Marina Biotech, Inc. as of December 31, 2014 and 2013, and the results of its operations and its cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, the Company has suffered recurring losses from operations, has a significant accumulated deficit and has been unable to raise sufficient capital to fund its operations through the end of 2015. This raises substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters also are described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

/s/ Wolf & Company, P.C.

Boston, Massachusetts
February 17, 2015

MARINA BIOTECH, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

(In thousands, except per share data)	December 31, 2013	December 31, 2014
ASSETS		
Current assets:		
Cash	$ 909	$ 1,824
Accounts receivable	5	500
Prepaid expenses and other current assets	128	192
Total current assets	1,042	2,516
Intangible assets	6,700	6,700
Total assets	$ 7,742	$ 9,216
LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current liabilities:		
Accounts payable	$ 1,614	$ 687
Accrued payroll and employee benefits	1,505	183
Accrued interest	147	—
Other accrued liabilities	1,315	1,072
Accrued restructuring	12	—
Notes payable	1,615	—
Other debt	8	—
Total current liabilities	6,216	1,942
Fair value liability for price adjustable warrants	5,226	9,225
Fair value of stock to be issued to settle liabilities	1,019	75
Deferred tax liabilities	2,345	2,345
Total liabilities	$ 14,806	$ 13,587
Commitments and contingencies		
Stockholders' deficit:		
Preferred stock, $.01 par value; 100,000 shares authorized, 0 and 1,200 shares of Series C convertible preferred stock issued and outstanding at December 31, 2013 and 2014, respectively (preference in liquidation of Series C convertible preferred stock of $6,000,000 at December 31, 2014)	—	—
Common stock, $0.006 par value; 180,000,000 shares authorized, 16,937,661 and 25,523,216 shares issued and outstanding at December 31, 2013 and 2014, respectively	102	153
Additional paid-in capital	324,145	333,264
Accumulated deficit	(331,311)	(337,788)
Total stockholders' deficit	(7,064)	(4,371)
Total liabilities and stockholders' deficit	$ 7,742	$ 9,216

See report of independent registered public accounting firm and accompanying notes to the consolidated financial statements.

MARINA BIOTECH, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share data)	Year Ended December 31, 2013	2014
License and other revenue	$ 2,115	$ 500
Operating expenses:		
Research and development	715	686
General and administrative	1,765	3,334
Total operating expenses	2,480	4,020
Loss from operations	(365)	(3,520)
Other income (expense):		
Interest and other expense	(249)	(1,006)
Change in fair value liability for price adjustable warrants	151	13
Change in fair value of stock reserved for issuance to settle liabilities	31	(2,503)
Change in fair value of embedded features in notes payable and amendments to notes payable	829	—
Gain (loss) on debt extinguishment	(2,037)	5
Gain on equipment disposal	30	—
Gain on settled liabilities	—	534
Total other expense, net	(1,245)	(2,957)
Loss before income tax	(1,610)	(6,477)
Income tax benefit	(39)	—
Net loss	$ (1,571)	$ (6,477)
Net loss per common share – basic and diluted	$ (0.09)	$ (0.26)
Shares used in computing net loss per share – basic and diluted	16,937,661	24,634,535

See report of independent registered public accounting firm and accompanying notes to the consolidated financial statements.

MARINA BIOTECH, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF STOCKHOLDERS' DEFICIT

(In thousands, except share data)	Preferred Stock, par value $0.01		Common Stock, par value $0.006		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balance December 31, 2012	—	$ —	16,937,661	$102	$324,010	$(329,740)	$(5,628)
Compensation related to stock options	—	—	—	—	135	—	135
Net loss	—	—	—	—	—	(1,571)	(1,571)
Balance December 31, 2013	—	—	16,937,661	102	324,145	(331,311)	(7,064)
Issuance of Series C convertible preferred stock, net of issuance costs of $71	1,200	—	—	—	5,929	—	5,929
Fair value of price-adjustable warrants issued in connection with Series C Convertible Preferred Stock	—	—	—	—	(5,929)	—	(5,929)
Shares issued in connection with lease termination	—	—	1,500,000	9	1,851	—	1,860
Shares issued in connection with director and management compensation	—	—	2,473,854	15	882	—	897
Shares issued in connection with science advisory board compensation	—	—	107,988	1	55	—	56
Shares issued in connection with consulting services	—	—	39,945	—	19	—	19
Shares issued in connection with warrant exercises	—	—	1,405,706	8	1,930	—	1,938
Shares issued in connection with licensing and vendor payables	—	—	1,098,673	6	1,667	—	1,673
Shares issued in debt conversion	—	—	1,959,389	12	1,467	—	1,479
Beneficial debt conversion feature	—	—	—	—	971	—	971
Compensation related to stock options	—	—	—	—	277	—	277
Net loss	—	—	—	—	—	(6,477)	(6,477)
Balance December 31, 2014	1,200	$ —	25,523,216	$153	$333,264	$(337,788)	$(4,371)

See report of independent registered public accounting firm and accompanying notes to the consolidated financial statements.

MARINA BIOTECH, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)	Year Ended December 31, 2013	2014
Operating activities:		
Net loss	$(1,571)	$(6,477)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:		
Non-cash (gain)/loss on debt extinguishment	2,037	(5)
Non-cash interest expense	249	1,006
Non-cash gain on settlement of liabilities	—	(534)
Deferred income tax benefit	(39)	—
Compensation related to stock options, restricted stock and employee stock purchase plan	135	277
Gain on disposition of property and equipment	(30)	—
Changes in fair market value of liabilities:		
Stock reserved for issuance to settle liabilities	(31)	2,503
Embedded debt features	(829)	—
Price adjustable warrants	(151)	(13)
Changes in assets and liabilities:		
Accounts receivable	2	(495)
Prepaid expenses and other assets	22	(181)
Accounts payable	8	(563)
Deferred revenue	(115)	—
Accrued restructuring	(380)	(12)
Accrued and other liabilities	978	(285)
Net cash provided by (used in) operating activities	285	(4,779)
Investing activities:		
Change in restricted cash	380	—
Proceeds from the sale of property and equipment	30	—
Net cash provided by investing activities	410	—
Financing activities:		
Proceeds from sales of Series C preferred shares and warrants, net	—	5,929
Cash payments of notes payable	—	(250)
Cash proceeds from exercise of warrants		23
Insurance financing	(2)	(8)
Net cash provided by (used in) financing activities	(2)	5,694
Net increase in cash	693	915
Cash and cash equivalents – beginning of year	216	909
Cash and cash equivalents – end of year	$ 909	$ 1,824
Non-cash financing activities:		
Reclassification of fair value liability for price adjustable warrants exercised	—	$ 1,917
Issuance of common stock to settle liabilities	—	$ 3,517
Debt conversion to common shares	—	$ 1,479
Deemed dividend to Series C convertible preferred stockholders	—	$ 6,000
Supplemental Disclosure		
Cash paid for interest	$ 1	$ 83

See report of independent registered public accounting firm and accompanying notes to the consolidated financial statements.

Note 1 — Business, Liquidity and Summary of Significant Accounting Policies

Business

We are a biotechnology company focused on the discovery, development and commercialization of nucleic acid-based therapies to treat orphan diseases. Our pipeline includes CEQ508, a product in clinical development for the treatment of Familial Adenomatous Polyposis ("FAP"), for which we have received Orphan Drug Designation ("ODD") from the U.S. Food and Drug Administration ("FDA"), and preclinical programs for the treatment of type 1 myotonic dystrophy ("DM1") and Duchenne muscular dystrophy ("DMD").

Since 2010, we have strategically acquired/in-licensed and further developed nucleic acid chemistry and delivery-related technologies in order to establish a novel and differentiated drug discovery platform. This platform allows us to distinguish ourselves from others in the nucleic acid therapeutics area in that we are the only company capable of creating a wide variety of therapeutics targeting coding and non-coding RNA via multiple mechanisms of action such as RNA interference ("RNAi"), messenger RNA translational inhibition, exon skipping, microRNA ("miRNA") replacement, miRNA inhibition, and steric blocking in order to modulate gene expression either up or down depending on the specific mechanism of action. Our goal is to dramatically improve the lives of the patients and families affected by orphan diseases through either our own efforts or those of our collaborators and licensees.

Liquidity

The accompanying consolidated financial statements have been prepared on the basis that we will continue as a going concern, which contemplates realization of assets and the satisfaction of liabilities in the normal course of business. At December 31, 2014, we had an accumulated deficit of approximately $337.8 million, $112.1 million of which has been accumulated since the corporation focused on RNA therapeutics in June 2008. To the extent that sufficient funding is available, we will in the future continue to incur losses as we continue our research and development ("R&D") activities. In addition, we have had and will continue to have negative cash flows from operations. We have funded our losses primarily through the sale of common and preferred stock and warrants, revenue provided from our license agreements with other parties and, to a lesser extent, equipment financing facilities and secured loans. In 2014, we funded operations with a combination of issuances of preferred stock and license-related revenues. At December 31, 2014, we had a working capital surplus of $0.6 million and $1.8 million in cash. Our resumed operating activities consumed the majority of our cash resources during 2014.

In February 2014, certain debt holders exchanged secured promissory notes in the aggregate principal and interest amount of $1.5 million for 2.0 million shares of our common stock. In addition, in March 2014, we sold 1,200 shares of our Series C Convertible Preferred Stock and 6.0 million warrants to purchase one share of common stock for $0.75 per share, resulting in gross proceeds of $6.0 million. We believe that our current cash resources, which include an upfront licensing fee received from MiNA in January 2015, will enable us to fund our intended operations through July 2015. Our ability to execute our operating plan beyond July 2015 depends on our ability to obtain additional funding. The volatility in our stock price, as well as market conditions in general, could make it difficult for us to raise capital on favorable terms, or at all. If we fail to obtain additional capital when required, we may have to modify, delay or abandon some or all of our planned activities, or terminate our operations. These factors, among others, raise substantial doubt about our ability to continue as a going concern. The accompanying consolidated financial statements do not include any adjustments that may result from the outcome of this uncertainty. We are currently pursuing both non-dilutive means of obtaining additional capital, primarily from existing and potential future licenses and partnerships, and dilutive means of obtaining additional capital, primarily through the offering of our equity and debt securities. However, there can be no assurance that we will be successful in such endeavors.

Summary of Significant Accounting Policies

Principles of Consolidation — We consolidate our financial statements with our wholly-owned subsidiaries, Cequent, MDRNA, and Atossa, and eliminate any inter-company balances and transactions.

Use of Estimates — The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires our management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and reported amounts of revenues and expenses during the reporting periods. Estimates having relatively higher significance include revenue recognition, R&D costs, stock-based compensation, valuation of warrants, valuation and estimated lives of identifiable intangible assets, impairment of long-lived assets, valuation of features embedded within note agreements and amendments, and income taxes. Actual results could differ from those estimates.

Restricted Cash — Amounts pledged as collateral underlying letters of credit for lease deposits are classified as restricted cash. Changes in restricted cash have been presented as investing activities in the Consolidated Statements of Cash Flows.

Fair Value of Financial Instruments — We consider the fair value of cash, restricted cash, accounts receivable, accounts payable and accrued liabilities not to be materially different from their carrying value. These financial instruments have short-term maturities. We follow authoritative guidance with respect to fair value reporting issued by the Financial Accounting Standards Board ("FASB") for financial assets and liabilities, which defines fair value, provides guidance for measuring fair value and requires certain disclosures. The guidance does not apply to measurements related to share-based payments. The guidance discusses valuation techniques, such as the market approach (comparable market prices), the income approach (present value of future income or cash flow), and the cost approach (cost to replace the service capacity of an asset or replacement cost). The guidance establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. The following is a brief description of those three levels:

Level 1: Observable inputs such as quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3: Unobservable inputs in which little or no market data exists, therefore developed using estimates and assumptions developed by us, which reflect those that a market participant would use.

Our cash is subject to fair value measurement and is valued determined by Level 1 inputs. We measure the liability for committed stock issuances with a fixed share number using Level 1 inputs. We measure the liability for price adjustable warrants and certain features embedded in notes, using the Black-Scholes option pricing model ("Black-Scholes"), using Level 3 inputs. The following tables summarize our liabilities measured at fair value on a recurring basis as of December 31, 2013 and 2014:

	Balance at December 31, 2013	Level 1 Quoted prices in active markets for identical assets	Level 2 Significant other observable inputs	Level 3 Significant unobservable inputs
Liabilities:				
Fair value liability for price adjustable warrants	$5,226	$ —	$ —	$5,226
Fair value liability for shares to be issued	1,019	1,019	—	—
Total liabilities at fair value	$6,245	$1,019	$ —	$5,226

	Balance at December 31, 2014	Level 1 Quoted prices in active markets for identical assets	Level 2 Significant other observable inputs	Level 3 Significant unobservable inputs
Liabilities:				
Fair value liability for price adjustable warrants	$9,225	$ —	$ —	$9,225
Fair value liability for shares to be issued	75	75	—	—
Total liabilities at fair value	$9,300	$ 75	$ —	$9,225

The following presents the activity in our accrued restructuring liability determined by Level 3 inputs for each of the years ended December 31, 2013 and 2014 (excludes stock to be issued, not carried in this liability account):

	Facility Related Liabilities	
(In thousands)	2013	2014
Balance, January 1	$ 392	$ 12
Cash payments	(380)	(12)
Balance, December 31	$ 12	$ —

The following presents activity of the fair value liability of price adjustable warrants determined by Level 3 inputs for the years ended December 31, 2013 and 2014:

	Fair value liability for price adjustable warrants (in thousands)	Weighted average as of each measurement date				
		Exercise Price	Stock Price	Volatility	Contractual life (in years)	Risk free rate
Balance at December 31, 2012	$ 4,169	$0.28	$0.46	146%	4.64	0.66%
Fair value of warrants issued in connection to amendments to notes payable	1,208	0.28	0.28	140%	5.50	1.55%
Change in fair value included in consolidated statement of operations	(151)	—	—	—	—	—
Balance at December 31, 2013	5,226	0.28	0.4	124%	4.08	1.30%
Fair value of price-adjustable warrants issued in connection with Series C Convertible Preferred Shares	5,929	0.75	1.50	123%	7.0	0.55%
Exercise of Warrants	(1,917)	0.36	1.14	133%	3.07	0.77%
Change in fair value included in consolidated statement of operations	(13)	—	—	—	—	—
Balance at December 31, 2014	$ 9,225	$0.42	0.95	121%	3.51	0.90%

Impairment of Long Lived Assets — We review all of our long-lived assets for impairment indicators throughout the year and perform detailed testing whenever impairment indicators are present. In addition, we perform detailed impairment testing for indefinite-lived intangible assets at least annually at December 31. When necessary, we record charges for impairments. Specifically:

- For finite-lived intangible assets, such as developed technology rights, and for other long-lived assets, such as property and equipment, we compare the undiscounted amount of the projected cash flows associated with the asset, or asset group, to the carrying amount. If the carrying amount is found to be greater, we record an impairment loss for the excess of book value over fair value. In addition, in all cases of an impairment review, we re-evaluate the remaining useful lives of the assets and modify them, as appropriate; and

- For indefinite-lived intangible assets, such as acquired in-process R&D assets, each year and whenever impairment indicators are present, we determine the fair value of the asset and record an impairment loss for the excess of book value over fair value, if any.

Accrued Restructuring — In both 2011 and 2012, we ceased operating leased facilities in Bothell, Washington and recorded an accrued liability for remaining lease termination costs at fair value, based on the remaining payments due under the lease and other costs. In 2013, final payments were made to the landlord.

Concentration of Credit Risk and Significant Customers — We operate in an industry that is highly regulated, competitive and rapidly changing and involves numerous risks and uncertainties. Significant technological and/or regulatory changes, the emergence of competitive products and other factors could negatively impact our consolidated financial position or results of operations.

We have been dependent on our collaborative and license agreements with a limited number of third parties for a substantial portion of our revenue, and our discovery and development activities may be delayed or reduced if we do not maintain successful collaborative arrangements. We had $2.1 million in licensing revenue in 2013 with 53% from Mirna Therapeutics, Inc. ("Mirna"), 38% from Arcturus, and 9% from Protiva Biotherapeutics, Inc. ("Tekmira"), a wholly-owned subsidiary of Tekmira Pharmaceuticals Corporation. We had $0.5 million in licensing revenue in 2014 from MiNA Therapeutics, Ltd. ("MiNA").

We maintain our cash in a single bank account. Any amount over the limits insured by the Federal Deposit Insurance Corporation could be at risk in the event of a bank default.

Revenue Recognition — Revenue is recognized when persuasive evidence that an arrangement exists, delivery has occurred, collectability is reasonably assured, and fees are fixed or determinable. Deferred revenue expected to be recognized within the next 12 months is classified as current. Substantially all of our revenues are generated from licensing arrangements that do not involve multiple deliverables and have no ongoing influence, control or R&D obligations. Our license arrangements may include upfront non-refundable payments, development milestone payments, patent-based or product sale royalties, and commercial sales, all of which are treated as separate units of accounting. In addition, we may receive revenues from sub-licensing arrangements. For each separate unit of accounting, we have determined that the delivered item has value to the other party on a stand-alone basis, we have objective and reliable evidence of fair value using available internal evidence for the undelivered item(s) and our arrangements generally do not contain a general right of return relative to the delivered item.

Revenue from licensing arrangements is recorded when earned based on the specific terms of the contracts. Upfront non-refundable payments, where we are not providing any continuing services as in the case of a license to our IP, are recognized when the license becomes available to the other party.

Milestone payments typically represent nonrefundable payments to be received in conjunction with the uncertain achievement of a specific event identified in the contract, such as initiation or completion of specified development activities or specific regulatory actions such as the filing of an Investigational New Drug Application ("IND"). We believe a milestone payment represents the culmination of a distinct earnings process when it is not associated with ongoing research, development or other performance on our part and it is substantive in nature. We recognize such milestone payments as revenue when it becomes due and collection is reasonably assured.

Royalty and earn-out payment revenues are generally recognized upon commercial product sales by the licensee as reported by the licensee.

R&D Costs — All R&D costs are charged to operations as incurred. R&D expenses consist of costs incurred for internal and external R&D and include direct and research-related overhead expenses.

Stock-based Compensation — We use Black-Scholes as our method of valuation for stock-based awards. Stock-based compensation expense is based on the value of the portion of the stock-based award that will vest during the period, adjusted for expected forfeitures. The estimation of stock-based awards that will ultimately vest requires judgment, and to the extent actual or updated results differ from our current estimates, such amounts will be recorded in the period the estimates are revised. Black-Scholes requires the input of highly subjective assumptions, and other reasonable assumptions could provide differing results. Our determination of the fair value of stock-based awards on the date of grant using an option pricing model is affected by our stock price as well as assumptions regarding a number of highly complex and subjective variables. These variables include, but are not limited to, the expected life of the award and

expected stock price volatility over the term of the award. Stock-based compensation expense is recognized immediately for immediately vested portions of the grant, with the remaining portions recognized on a straight-line basis over the applicable vesting periods based on the fair value of such stock-based awards on the grant date. Forfeiture rates have been estimated based on historical rates and compensation expense is adjusted for general forfeiture rates in each period. Starting in September 2014, we did not use historical forfeiture rates and did not apply a forfeiture rate as the historical forfeiture rate was not believed to be a reasonable estimate of the probability that the outstanding awards would be exercised in the future. Given the specific terms of the awards and the recipient population, we expect these options will all be exercised in the future.

Non-employee stock compensation expense is recognized immediately for immediately vested portions of a grant, with the remaining portions recognized on a straight-line basis over the applicable vesting periods. At the end of each financial reporting period prior to vesting, the value of the unvested stock options, as calculated using Black-Scholes, is re-measured using the fair value of our common stock, and the stock-based compensation recognized during the period is adjusted accordingly.

Net Loss per Common Share — Basic and diluted net loss per common share is computed by dividing the net loss by the weighted average number of common shares outstanding during the period. Diluted loss per share excludes the effect of common stock equivalents (stock options, unvested restricted stock, warrants and subscription investment units, convertible debt related shares) since such inclusion in the computation would be anti-dilutive. The following shares have been excluded:

	Year Ended December 31,	
	2013	2014
Stock options outstanding	284,829	1,084,106
Warrants	17,017,601	21,212,813
Common shares underlying Series C convertible preferred stock	—	8,000,000
Total	17,302,430	30,296,919

Notes Payable — Notes payable are recorded under liabilities, classified into short and long term, depending on the principal due in the subsequent twelve months. Interest is either accrued or paid according to the terms of the notes. Costs associated with the issuance of debt, such as legal fees, are recorded as prepaid expenses and are amortized on a straight-line basis over the period to maturity of the debt.

Note amendments and changes must be analyzed for correct accounting application based on our financial condition and the changes in the debt instrument features and terms. For each note amendment, a series of analyses is performed to determine first whether the amendment was a troubled debt restructuring, as defined by conditions of default, our financial state and ability to repay loan, and whether the lender made a concession. If an amendment is not a troubled debt restructuring, then we perform a further analysis to determine if the amended terms are "substantially different" from the existing debt facility. The debt is considered extinguished if the present value of the cash flows under the terms of the new debt instrument is at least 10 percent different from the present value of the remaining cash flows under the terms of the original instrument. The new debt instrument is initially recorded at fair value, and that amount is used to determine the debt extinguishment gain or loss recognized and the effective rate of the new instrument. If it is determined that the original and new debt instruments are not substantially different, then a new effective interest rate is determined based on the carrying amount of the original debt instrument resulting from the modification, and the revised cash flows. If the exchange or modification is to be accounted for in the same manner as a debt extinguishment and the new debt instrument is initially recorded at fair value, then the fees paid including the fair value of warrants issued are included in the debt extinguishment gain or loss. If the exchange or modification is not to be accounted for in the same manner as a debt extinguishment, then the fees paid including the fair value of warrants issued are amortized as an adjustment of interest expense over the remaining term of the replacement or modified debt instrument using the interest method.

Income Taxes — Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of assets and liabilities and their respective tax bases and operating loss and tax credit carry-forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in years in which those temporary differences are expected to be recovered or pledged. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. Tax benefits in excess of stock-based compensation expense recorded for financial reporting purposes relating to stock-based awards will be credited to additional paid-in capital in the period the related tax deductions are realized. Our policy for recording interest and penalties associated with audits is to record such items as a component of loss before taxes.

We assess the likelihood that our deferred tax assets will be recovered from existing deferred tax liabilities or future taxable income. Factors we considered in making such an assessment include, but are not limited to, estimated utilization limitations of operating loss and tax credit carry-forwards, expected reversals of deferred tax liabilities, past performance, including our history of operating results, our recent history of generating tax losses, our history of recovering net operating loss carry-forwards for tax purposes and our expectation of future taxable income. We recognize a valuation allowance to reduce such deferred tax assets to amounts that are more likely than not to be ultimately realized. To the extent that we establish a valuation allowance or change this allowance, we would recognize a tax provision or benefit in the consolidated statements of operations. We use our judgment to determine estimates associated with the calculation of our provision or benefit for income taxes, and in our evaluation of the need for a valuation allowance recorded against our net deferred tax assets.

Note 2 — Intangible assets

In July 2010, we acquired Cequent. A substantial portion of the assets acquired were allocated to identifiable intangible assets related to in-process research and development ("IPR&D") projects identified by our chief executive officer. Our chief executive officer estimated acquisition-date fair values of these intangible assets based on a number of factors. Utilizing the income approach, a discounted cash flow model using forecasted operating results related to the identified intangible assets, fair value was determined to be $19.3 million for FAP and $3.4 million for *tk*RNAi, for a total of $22.7 million. We recorded a loss on impairment of these intangible assets of $16.0 million in 2011.

We tested the carrying value of our intangible assets for impairment as of December 31, 2013 and 2014, utilizing the income approach. We estimated the fair value of these intangible assets using a discount rate of 22%. We probability adjusted our estimation of the expected future cash flows associated with each project and then determined the present value of the expected future cash flows using the discount rate. The projected cash flows from the projects were based on key assumptions, including those outlined above. As no impairment was indicated, no loss was recorded in 2013. Using a similar analysis with a 22% discount rate, no impairment was indicated at December 31, 2014 and no loss on impairment was recorded in 2014.

Deferred Taxes — Our acquisition of Cequent in 2010 was treated as a tax-free merger. Deferred tax assets acquired were comprised of $7.0 million of federal and state net operating loss carry-forwards and $1.1 million of tax credit carry-forwards. The tax basis for acquired intangible assets of $22.7 million is nil, which results in a deferred tax liability of $8.0 million, as there will be no tax deduction when the book basis is expensed and the deferred tax liability is reduced. After considering the impairment loss in 2011 and the current carrying value of the intangible assets, at December 31, 2013 and 2014, we had a deferred tax liability of $2.4 million related to these intangible assets. No material change was recorded in 2013 or 2014. Due to uncertainty as to the timing of the reversal, we determined that the deferred tax liability did not support realization of any deferred tax assets (see Note 8).

Note 3 — Accrued Expenses

The following summarizes the major components of the accrued expenses balance at December 31, 2013 and 2014.

	Year Ended December 31,	
	2013	2014
Corporate legal fees	$ 138	$ 564
Audit, tax and filing services	454	189
Interest accrued	138	—
Taxes and Delaware fees	450	96
Board fees	—	45
Consulting equity instruments	—	40
Sublicense fees	125	125
Other miscellaneous	10	13
	$1,315	$1,072

Note 4 — Restructuring Charges

In September 2012, we executed a lease termination agreement effective March, 2013 for our Bothell, Washington facility. Under the agreement, the remaining 2012 rent of $0.5 million and remaining 2013 rent of $0.4 million would be paid, mostly by a draw on the letter of credit. Additionally, we agreed to issue 1.5 million shares of our common stock on certain future financing events valued as a charge to restructuring of $0.45 million. The stock was issued on the closing of our March 2014 financing, resulting in a 2014 charge of $1.1 million based on the change in fair value of the stock reserved to settle the liability. The lease termination in 2012 resulted in the elimination of $1.1 million of deferred rent, offset by restructuring future rent charges of $0.85 million and a stock liability of $0.45 million. There were no additional restructuring charges in 2013 or 2014.

Note 5 — Notes Payable

Original Issuance and Amendments — In February 2012, we issued $1.5 million of notes payable at 15% interest to two investors. The notes were secured by the assets of our company. The original maturity date was May 2012, and the notes were callable on condition of default. Price adjustable warrants to purchase 3.7 million common shares at $0.508 were issued and were exercisable through August 2017. Through a series of subsequent amendments, we were required to pay $0.2 million of accrued interest and issued additional price adjustable warrants to purchase 3.2 million shares and the exercise price of these and the original warrants was adjusted to $0.28. Each warrant had a contractual term of five years after the issue date.

Amendments in 2013 — In February 2013, we amended the notes to extend the maturity date to April 30, 2013. In exchange for the extension, we issued additional price adjustable warrants to purchase 1.0 million common shares at $0.28 before August 2018. The terms of the amended notes were determined to be substantially different from the prior note terms, and the amendment, therefore, was recorded as an extinguishment. In August 2013, we amended the notes to extend the maturity date to March 2014. Additionally, the terms of the notes were changed to a claim on a portion of the cash receipts from license payments and any financing, with any remaining principal and accrued interest to convert in any financing to the securities underlying the financing and with a conversion price equal to the effective price paid by other participating investors. In exchange for the amendment, we issued additional price adjustable warrants to purchase 4.0 million shares at $0.28 before February 2019. The terms of the amended notes were determined to be substantially different from the prior note terms, and the amendment, therefore, was recorded as an extinguishment.

During the year ended December 31, 2013, we recorded interest expense related to the notes of $0.25 million, a loss on debt extinguishments of $2.0 million and a gain on the change in the fair value of embedded debt features of $0.8 million. In the year ended December 31, 2014, we recorded interest expense related to the notes of $1.0 million and an immaterial gain on debt extinguishment.

In February 2014, the note holders exchanged the notes in the aggregate principal and interest amount of $1.5 million for approximately 2.0 million shares of our common stock.

Note 6 — Stockholders' Equity

Preferred Stock — Our board of directors has the authority, without action by the stockholders, to designate and issue up to 100,000 shares of preferred stock in one or more series and to designate the rights, preferences and privileges of each series, any or all of which may be greater than the rights of our common stock. We have designated 1,000 shares as Series B Preferred Stock ("Series B Preferred") and 90,000 shares as Series A Junior Participating Preferred Stock ("Series A Junior Preferred"). No shares of Series B Preferred or Series A Junior Preferred are outstanding. In March 2014, we designated and issued 1,200 shares of Series C Preferred Stock ("Series C Preferred") for $6.0 million.

Stockholder Rights Plan — In 2000, our board of directors adopted a stockholder rights plan and declared a dividend of one preferred stock purchase right for each outstanding share of common stock to shareholders of record in March 2000 and for any common stock issued thereafter. The preferred share purchase rights expired in March 2013.

Common Stock — Holders of our common stock are entitled to one vote for each share held of record on all matters submitted to a vote of the holders of our common stock. Subject to the rights of the holders of any class of our capital stock having any preference or priority over our common stock, the holders of our common stock are entitled to receive dividends that are declared by our board of directors out of legally available funds. In the event of our liquidation, dissolution or winding-up, the holders of common stock are entitled to share ratably in our net assets remaining after payment of liabilities, subject to prior rights of preferred stock, if any, then outstanding. Our common stock has no preemptive rights, conversion rights, redemption rights or sinking fund provisions, and there are no dividends in arrears or default. All shares of our common stock have equal distribution, liquidation and voting rights, and have no preferences or exchange rights. Our common stock currently trades on the OTCQB.

In March 2014, we issued 0.1 million shares with a fair value of $0.01 million to a vendor under the terms of a 2012 compromise and release agreement.

In September 2012, as part of the lease termination agreement, we agreed to issue 1.5 million shares of our common stock to a landlord. The shares were issued in March 2014 at a value of $1.9 million.

As part of the asset purchase agreement that we entered into with Novosom in July 2010, we are obligated to pay Novosom 30% of any payments received by us for sub-licensed SMARTICLES® technology. The consideration is payable in a combination of cash (no more than 50% of total due) and common stock (between 50% and 100% of total due), at our discretion. For such consideration related to MiRNA and ProNAi payments received in 2012 and 2013, we issued 0.96 million common shares with a fair value of $1.5 million in March 2014.

In January 2014, we issued 2.8 million shares of common stock with fair value of $1.0 million to employees and board members for amounts due under certain employment and board of director agreements, of which 0.3 million shares were repurchased and retired in December 2014 in connection with the satisfaction of tax withholding obligations.

In January 2014, we issued 0.09 million shares of common stock with a fair value of $0.03 million to scientific advisory board members for services to be provided during the three months ended March 31, 2014.

In January 2014 and April 2014, we issued an aggregate of 0.04 million shares of common stock with a fair value of $0.02 million to consultants for services provided during the six months ended June 30, 2014.

In February 2014, we issued an aggregate of 2.0 million shares of common stock with a fair value of $1.48 million on the conversion of outstanding principal and unpaid accrued interest associated with our convertible debt.

In April 2014, we issued 0.02 million shares of common stock with a fair value of $0.03 million to scientific advisory board members for services to be provided during the three months ended June 30, 2014.

In September 2014, we issued 0.05 million shares of common stock with fair value of $0.06 million to a vendor to settle an outstanding payable under the terms of a 2012 compromise and release agreement.

During 2014, we issued 1.32 million shares of common stock upon net share exercises and 0.08 million shares of common stock on cash exercises of warrants.

In December 2014, we pledged to issue common stock valued at $0.075 million to Novosom, related to our license agreement with MiNA, for the portion due under its sublicensing agreement. Pricing of the common stock was to occur on receipt of the payment from MiNA. As of December 2014, the pledge was issued as a dollar denominated liability and was not influenced by changes in stock price. This obligation is included in Fair Value of Stock to be Issued to Settle Liabilities at December 31, 2014.

Warrants — In consideration of additional promissory note amendments in 2013, we issued additional price adjustable warrants to purchase 5.0 million shares of our common stock at an exercise price of $0.28, expiring in 2018 and 2019.

In December 2013, we issued warrants to purchase up to 0.10 million shares of our common stock to a consultant who is our interim chief financial officer. These warrants vest over two years, have a fixed strike price of $0.48, and expire in December 2023. At December 31, 2014, the unvested warrants have a fair value of $0.03 million.

In March 2014, in conjunction with the issuance of Series C Preferred, we issued price adjustable warrants to purchase up to 6.0 million shares of our common stock at an exercise price of $0.75 per share.

During 2014, we issued 1.32 million shares of common stock upon net share exercises and 0.08 million shares on cash exercises of warrants.

In April 2014, we issued warrants to purchase up to 0.075 million shares of our common stock to a vendor. These warrants have a fixed strike price of $0.89 and expire in April 2024. The fair value of these warrants is immaterial.

In December 2014, we issued warrants to purchase up to 0.117 million shares to five consultants providing financial, scientific and development consulting services to our company. The fair value of these warrants is immaterial.

The following summarizes warrant activity during the years ended December 31, 2013 and 2014.

	Warrant Shares	Weighted Average Exercise Price
Outstanding, January 1, 2013	11,916,801	1.71
Issued	5,100,800	0.28
Outstanding, December 31, 2013	17,017,601	1.29
Issued	6,191,500	0.75
Exercised or cancelled	(1,996,288)	0.36
Outstanding, December 31, 2014	21,212,813	1.19
Expiring in 2015	285,345	
Expiring in 2016	—	
Expiring in 2017	7,235,622	
Expiring thereafter	13,691,846	

Note 7 — Stock Incentive Plans

At December 31, 2014, options to purchase up to 1.1 million shares of our common stock were outstanding, and 8.4 million shares were reserved for future awards under our stock incentive plans.

Our current stock incentive plans include the 2008 Stock Incentive Plan and the 2014 Long Term Incentive Plan. Under our stock compensation plans, we are authorized to grant options to purchase shares of common stock to our employees, officers and directors and other persons who provide services to us.

The options to be granted are designated as either incentive stock options or non-qualified stock options by our board of directors, which also has discretion as to the person to be granted options, the number of shares subject to the options and the terms of the option agreements. Only employees, including officers and part-time employees, may be granted incentive stock options. Under our 2008 and 2014 stock incentive plans, we are authorized to grant awards of stock options, restricted stock, stock appreciation rights and performance shares. At December 31, 2014, no stock appreciation rights or performance shares have been granted. Standard options granted under the plans generally have terms of ten years from the date of grant and vest over three years.

Stock-based Compensation. Certain option and share awards provide for accelerated vesting if there is a change in control as defined in the applicable plan and certain employment agreements. The following table summarizes stock-based compensation expense:

	Year Ended December 31,	
(In thousands)	2013	2014
Research and development	$ 53	$ 48
General and administrative	82	229
Total	$135	$277

Stock Options — Stock option activity in 2013 and 2014 was as follows:

	Year Ended December 31,			
	2013		2014	
	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
Outstanding on January 1	284,829	$39.46	284,829	$39.46
Issued	—	—	1,039,000	1.07
Forfeited/Expired	—	—	(239,723)	18.02
Outstanding on December 31	284,829	$39.46	1,084,106	$ 5.52
Exercisable as of December 31	246,559	$45.28	179,106	$28.06

The following table summarizes additional information on our stock options outstanding at December 31, 2014:

	Options Outstanding			Options Exercisable	
Range of Exercise Prices	Number Outstanding	Weighted-Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price
$0.82	20,000	4.80	$ 0.82	10,000	$ 0.82
$1.07	1,019,000	8.49	1.07	124,000	1.07
$2.00 − $2.20	2,500	6.70	2.20	2,500	2.20
$11.60 − $50.00	10,500	3.44	47.60	10,500	47.60
$50.00 − $90.80	10,500	3.40	87.60	10,500	87.60
$127.60 − $207.60	21,500	3.40	158.30	21,500	158.30
$420.00 − $588.80	106	2.10	526.40	106	526.40
Totals	1,084,106	8.23	$ 5.52	179,106	$ 28.06
		Weighted-Average Exercisable Remaining Contractual Life (Years)			4.44

We use Black-Scholes to determine the fair value of our stock-based awards. The determination of the fair value of stock-based awards on the date of grant using an option-pricing model is affected by our stock price, as well as by assumptions regarding a number of complex and subjective variables. We meet the criteria, having had significant past structural changes, such that our historical exercise data are not

reasonably extrapolated to an expected term. Given the terms of the awards and the population of recipients, we believe that expected term is equal to the contractual term. We estimate volatility of our common stock by using our stock price history to forecast stock price volatility. The risk-free interest rates used in the valuation model were based on U.S. Treasury issues with terms similar to the expected term on the options. We do not anticipate paying any dividends in the foreseeable future. No options were granted in 2013 and 1.0 million options were granted in 2014.

At December 31, 2014, we had $1.6 million of total unrecognized compensation expense related to unvested stock options. We expect to recognize this cost over a weighted average period of 2.0 years.

At December 31, 2014, the intrinsic value of options outstanding or exercisable was zero as there were no options outstanding with an exercise price less than the per share closing market price of our common stock at that date. No options were exercised in either 2013 or 2014. The total grant date fair value of options that vested during 2013 and 2014 was $0.15 million and $0.12 million, respectively.

In January 2015, we issued options to purchase up to an aggregate of 152,000 shares of our common stock to the non-employee members of our board of directors at an exercise price of $0.635 per share as the annual grant to such directors for their service on our board of directors during 2015, and we issued options to purchase up to an aggregate of 80,000 shares of our common stock to the members of our scientific advisory board at an exercise price of $0.63 per share as the annual grant to such persons for their service on our scientific advisory board during 2015.

Note 8 — Income Taxes

We have identified our federal and Massachusetts state tax returns as "major" tax jurisdictions. The periods our income tax returns are first subject to examination for federal and Massachusetts jurisdictions are 2010 and 2005, respectively. We believe our income tax filing positions and deductions will be sustained on audit, and we do not anticipate any adjustments that would result in a material change to our financial position. Therefore, no liabilities for uncertain income tax positions have been recorded.

At December 31, 2014, we had available net operating loss carry-forwards for federal and state income tax reporting purposes of $310.0 million and $0.0 million, respectively, and had available tax credit carry-forwards for federal and state income tax reporting purposes of $10.6 million and $0.1 million, which are available to offset future taxable income. Portions of these carry-forwards will expire through 2032 if not otherwise utilized. We have not performed a formal analysis, but our ability to use such net operating losses and tax credit carry-forwards is subject to annual limitations due to change of control provisions under Sections 382 and 383 of the Internal Revenue Code, and such limitation could be significant.

Our net deferred tax assets, liabilities and valuation allowance as of December 31, 2013 and 2014 are as follows:

	Year Ended December 31,	
(In thousands)	**2013**	**2014**
Deferred tax assets:		
Net operating loss carryforwards	$ 108,110	$ 108,348
Tax credit carryforwards	10,783	10,696
Depreciation and amortization	3,605	3,709
Other	78	185
Total deferred tax assets	122,576	122,938
Valuation allowance	(122,576)	(122,938)
Net deferred tax assets	—	—
Deferred tax liabilities:		
Intangible assets	(2,345)	(2,345)
Net deferred tax liabilities	$ (2,345)	$ (2,345)

We record a valuation allowance in the full amount of deferred tax assets not otherwise offset by deferred tax liabilities that we expect to reverse since realization of such tax benefits has been determined by our management to be less likely than not. The valuation allowance decreased $0.06 million and increased $0.36 million during 2013 and 2014, respectively.

Income Tax Expense. In 2013 there was a deferred income tax benefit of $0.04 million due to changes in effective state tax rates and in 2014 there was no income tax benefit or recorded expense.

Note 9 — Intellectual Property and Collaborative Agreements

MiNA — In December 2014, we entered into a license agreement with MiNA regarding the development and commercialization of small activating RNA-based therapeutics utilizing MiNA's proprietary oligonucleotides and our SMARTICLES nucleic acid delivery technology. MiNA will have full responsibility for the development and commercialization of any products arising under the agreement. We received an upfront fee of $0.5 million in January 2015. We could receive up to an additional $49 million in clinical and commercialization milestone payments, as well as royalties on sales, based on the successful development of MiNA's potential product candidates.

Arcturus — In August 2013, we and Arcturus entered into a patent assignment and license agreement pursuant to which Arcturus was granted an assignment of select RNA related patents and certain transferable agreements, including agreements with F. Hoffmann-La Roche Inc. and F. Hoffmann-La Roche Ltd., dated February 2009, and Tekmira, dated November 2012. We received an irrevocable, royalty-free, worldwide, non-exclusive sublicense to use the transferred technologies in the development and commercialization of our products. As compensation under this agreement, we received a one-time payment of $0.8 million.

Tekmira — In November 2012, we and Tekmira entered into a license agreement pursuant to which Tekmira was granted a worldwide, non-exclusive and selectively sub-licensable license to develop and commercialize products using our Unlocked Nucleobase Analog ("UNA") technology. We received a $0.3 million upfront payment and an additional $0.2 million received in April 2013. This agreement was transferred to Arcturus as part of the patent assignment and license agreement in August 2013.

Mirna — In December 2011, we entered into agreement with Mirna relating to the development and commercialization of miRNA-based therapeutics utilizing Mirna's proprietary miRNAs and our SMARTICLES delivery technology. The agreement provides that Mirna will have full responsibility for the development and commercialization of any products arising under the agreement and that we will support pre-clinical and process development efforts. Under terms of the agreement, we could receive up to $63.0 million in upfront, clinical and commercialization milestone payments, as well as royalties on product sales in the low single digit percentages. Either party may terminate the agreement upon the occurrence of a default by the other party. Mirna has the right to terminate the agreement upon 60 days prior written notice. In December 2013, the agreement was amended to add the right for Mirna to select additional compounds for development. Mirna identified three selected compounds for an upfront payment of $1.0 million. Future additional selections can be identified for an upfront payment of $0.5 million per selection. All other per compound payments remain unchanged, except that no royalties will be owed on sales of the original licensed compound.

Novosom — In July 2010, we entered into an agreement pursuant to which we acquired the intellectual property for Novosom AG's ("Novosom") SMARTICLES-based liposomal delivery system. We issued to Novosom 0.14 million shares of our common stock with a value of $3.8 million as consideration for the acquired assets, which was recorded as an R&D expense. As additional consideration, we are obligated to pay an amount equal to 30% of the value of each upfront (or combined) payment received by us in respect of the license or disposition of SMARTICLES technology or related product, up to a maximum of $3.3 million, which will be paid in a combination of cash and/or shares of our common stock, at our discretion. In December 2011, we recognized $0.1 million as R&D expense for additional consideration paid to Novosom for an upfront payment receipt. During 2012, we reserved 0.51 million shares of common stock for future issuance with no cash component as additional consideration as a result of the license agreements that we entered into with Mirna and Monsanto Company. During 2013, as a result of the payment received from Mirna for additional compounds, we opted to record a $0.15 million cash payable and reserve an

additional 0.45 million shares for future issuance. All balances due Novosom as of December 2013, both cash and stock, were paid or issued in March 2014. In December 2014, we recorded an upfront license fee from MiNA, and recorded an amount due Novosom of $0.075 million and pledged to issue $0.075 million in common stock. In January 2015, we settled amounts due with cash and 0.12 million shares of common stock.

Valeant Pharmaceuticals — In March 2010, we acquired intellectual property related to conformationally restricted nucleotide ("CRN") technology from Valeant Pharmaceuticals North America ("Valeant") for a licensing fee recorded as R&D expense. Subject to meeting certain milestones, we may be obligated to make a development milestone payment of $5.0 million and $2.0 million within 180 days of FDA approval of a New Drug Application for our first and second CRN related product, respectively. As of December 31, 2014, we had not satisfied any conditions triggering milestone payments. Valeant is entitled to receive low single-digit percentage based earn-out payments on commercial sales and revenue from sublicensing. The agreement requires us to use commercially reasonable efforts to develop and commercialize at least one covered product and if we have not made earn-out payments of at least $5.0 million prior to March 2016, we are required to pay Valeant an annual amount equal to $0.05 million per assigned patent, which shall be creditable against other payment obligations. The term of our financial obligations under the agreement shall end, on a country-by-country basis, when there no longer exists any valid claim in such country. We may terminate the agreement upon 30 days written notice, or upon 10 days written notice in the event of adverse results from clinical studies. Upon termination, we are obligated to pay all accrued amounts due but shall have no future payment obligations.

University of Helsinki — In June 2008, we entered into a collaboration agreement with Dr. Pirjo Laakkonen and the Biomedicum Helsinki. The agreement terminated in June 2012. After termination, we may still be obligated to make development milestone payments of up to €0.275 million for each product developed. At December 31, 2014, none of the milestone triggers had been met. In addition, upon the first commercial sale of a product, we are required to pay an advance of €0.25 million credit against future royalties. We will owe in low single digit percentage royalty payments on product sales.

Note 10 — Commitments and Contingencies

Standby Letter of Credit/Leases — In connection with the lease termination of our Bothell, Washington facility, the landlord drew $0.38 million from our letter of credit in 2013 before the credit facility was closed in March 2013. At March 1, 2013, we had terminated all facility leases.

Contingencies — We are subject to various legal proceedings and claims that arise in the ordinary course of business. Our management currently believes that resolution of such legal matters will not have a material adverse impact on our consolidated financial position, results of operations or cash flows.

Note 11 — Subsequent Events

All material subsequent events have been included within footnotes 1, 6, 7 and 9 of the Consolidated Financial Statements.

ITEM 9. ***Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.***

None.

ITEM 9A. ***Controls and Procedures.***

(a) *Disclosure Controls and Procedures.* As of the end of the period covered by this Annual Report on Form 10-K, we carried out an evaluation, under the supervision and with the participation of senior management, including our chief executive officer ("CEO") and interim chief financial officer ("CFO"), of the effectiveness of the design and operation of our disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Based on that evaluation, our CEO and CFO concluded that our disclosure controls and procedures were effective in recording, processing, summarizing and reporting, on a timely basis, information required to be disclosed by us in the reports that we file or submit under the Exchange Act.

(b) *Internal Control over Financial Reporting.* Management had previously reported to the Board of Directors and the Audit Committee thereof material weaknesses described under the heading "Management Report on Internal Control" contained in Item 9A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2013. With the availability of funds, we have been able to resume and strengthen internal control processes throughout 2014 with increased oversight on our financial reporting, and, as a result, the material weaknesses discussed therein have been remediated. Specifically, during the fiscal quarter ended December 31, 2014, we finalized the implementation of internal control enhancements regarding the impairment testing of the fair value of intangible assets, the separation of duties (including account reconciliation), and the institution of a formal monthly close and timely reporting to management.

(c) *Management Report on Internal Control.* Management is responsible for establishing and maintaining effective internal control over financial reporting. Internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act, is a process designed by, or under the supervision of, our CEO and CFO, or persons performing similar functions, and effected by our Board, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles (GAAP). Our management, with the participation of our CEO and CFO, has established and maintained policies and procedures designed to maintain the adequacy of our internal control over financial reporting, and include those policies and procedures that:

1) Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets;

2) Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

3) Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Management has evaluated the effectiveness of our internal control over financial reporting as of December 31, 2014, based on the control criteria established in a report entitled *Internal Control — Integrated Framework*, issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") (1992 Framework). Based on our assessment and those criteria, our management has concluded that our internal control over financial reporting is effective as of December 31, 2014.

This annual report does not include an attestation report of our registered public accounting firm regarding internal control over financial reporting. Such a report is not required for smaller reporting companies such as us pursuant to The Dodd-Frank Wall Street Reform and Consumer Protection Act that Congress enacted in July 2010, which permanently exempts companies with less than $75 million in market capitalization from Section 404(b) of the Sarbanes-Oxley Act of 2002 requiring an outside auditor to attest annually to a company's internal-control evaluations.

(d) Because of its inherent limitations, internal control over financial reporting may not prevent or detect all errors or misstatements and all fraud. Therefore, even those systems determined to be effective can provide only reasonable, not absolute, assurance that the objectives of the policies and procedures are met. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

ITEM 9B. ***Other Information.***

None.

PART III

ITEM 10. ***Directors, Executive Officers and Corporate Governance.***

General

As of February 17, 2015, the number of members of our Board of Directors is fixed at five (5). The members of our Board of Directors as of February 17, 2015 are as follows:

Name	Age	Position	Director Since
J. Michael French	55	Chief Executive Officer, President and Chairman of the Board of Directors	September 2008
Stefan C. Loren, Ph.D. . .	50	Lead Independent Director	August 2012
Joseph W. Ramelli	46	Director	August 2012
Philip C. Ranker	55	Director	January 2014
Donald A. Williams	56	Director	September 2014

The biographies of each director below contains information regarding the person's service as a director, business experience, director positions held currently or at any time during the last five years, and information regarding involvement in certain legal or administrative proceedings, if applicable.

J. Michael French — Mr. French has served as our chief executive officer ("CEO") since June 23, 2008, as our president since October 1, 2008, and as a member of our board of directors since September 11, 2008. Mr. French was appointed chairman of our board of directors on August 21, 2012. Prior to joining us, Mr. French served as president of Rosetta Genomics, Inc. from May 2007 to August 2007. Mr. French also served as senior vice president of corporate development for Sirna Therapeutics, Inc. ("Sirna") from July 2005 to January 2007, when Sirna was acquired by Merck and Co., Inc., and he served in various executive positions, including chief business officer, senior vice president of business development and vice president of strategic alliances, of Entelos, Inc., a pre-IPO biotechnology company, from 2000 to 2005. Mr. French, holds a B.S. in aerospace engineering from the U.S. Military Academy at West Point and a M.S. in physiology and biophysics from Georgetown University.

Stefan C. Loren, Ph.D. — Dr. Loren has served as a director of our company since August 2012. Dr. Loren is currently the founder at Loren Capital Strategy, an investment fund. He was previously managing director at Westwicke Partners, a healthcare-focused consulting firm, from 2008 through February 2014. Dr. Loren has over 20 years of experience as a research and investment professional in the healthcare space, including roles at Perceptive Advisors, MTB Investment Advisors, Legg Mason, and Abbott Laboratories. Prior to industry, Dr. Loren served as a researcher at The Scripps Research Institute working with Nobel Laureate K. Barry Sharpless on novel synthetic routes to chiral drugs. His scientific work has been featured in Scientific American, Time, Newsweek and Discover, as well as other periodicals and journals. Dr. Loren has served as a director of GenVec, Inc. since September 2013, and within the past five years, he has served on the board of directors of Orchid Cellmark Inc. and PolyMedix, Inc. Dr. Loren received a doctorate degree in organic/pharmaceutical chemistry from the University of California at Berkeley and a bachelor's degree in chemistry from the University of California San Diego.

Joseph W. Ramelli — Mr. Ramelli has served as a director of our company since August 2012. Mr. Ramelli currently works as a consultant for several investment funds providing in-depth due diligence and investment recommendations. He has over 20 years of experience in the investment industry, having worked as both an institutional equity trader and as an equity analyst at Eos Funds, Robert W. Duggan & Associates and Seneca Capital Management. Mr. Ramelli graduated with honors from the University of California at Santa Barbara, with a B.A. in business economics.

Philip C. Ranker — Mr. Ranker has served as a director of our company since January 2014. Currently, Mr. Ranker serves as chief financial officer at Bioness, Inc. Previously he served as our chief accounting officer from September 7, 2011 until September 30, 2011, and then served as our interim chief financial officer and secretary from October 1, 2011 until December 31, 2013. Before that, Mr. Ranker served as chief financial officer of Suneva Medical, Inc. from 2009 to 2011, and as vice president of finance at Amylin Pharmaceuticals, Inc. from 2008 to 2009. Prior to Amylin, Mr. Ranker held various positions

with Nastech Pharmaceutical Company Inc. (the predecessor to Marina Biotech) from 2004 to 2008, including vice president of finance from August 2004 until September 2005, and chief financial officer and secretary from September 2005 until January 2008. From September 2001 to August 2004, Mr. Ranker served as director of finance for ICOS Corporation. Prior to working at ICOS, Mr. Ranker served in various positions in corporate accounting, managed care contracting and research and development, including senior finance director, at Aventis Pharmaceutical and its predecessor companies during his nearly 15 years with the organization. From February 2006 until 2010, Mr. Ranker also served as a member of the board of directors and as the chair of the audit committee of ImaRx Therapeutics, Inc., which executed an initial public offering during his tenure. Prior to Aventis, Mr. Ranker was employed by Peat Marwick (currently KPMG) as a Certified Public Accountant. Mr. Ranker holds a B.S. in accounting from the University of Kansas.

Donald A. Williams — Mr. Williams has served as a director of our company since September 2014. Mr. Williams is a 35-year veteran of the public accounting industry, retiring in 2014. Mr. Williams spent 18 years as an Ernst & Young (EY) Partner and the last seven years as a partner with Grant Thornton (GT). Mr. Williams' career focused on private and public companies in the technology and life sciences sectors. During the last seven years at GT, he served as the national leader of Grant Thornton's life sciences practice and the managing partner of the San Diego Office. He was the lead partner for both EY and GT on multiple initial public offerings; secondary offerings; private and public debt financings; as well as numerous mergers and acquisitions. From 2001 to 2014, Mr. Williams served on the board of directors and is past president and chairman of the San Diego Venture Group and has served on the board of directors of various charitable organizations in the communities in which he has lived. Mr. Williams is a graduate of Southern Illinois University with a B.S. degree.

Executive Officers of Our Company

Biographical information concerning J. Michael French, our president and CEO, is set forth above. Biographical information concerning our interim chief financial officer is set forth below.

Daniel E. Geffken — Mr. Geffken, age 58, is a founder and managing director at Danforth Advisors, LLC, where he has served since 2011. He has worked in both the life science and renewable energy industries for the past 20 years. His work has ranged from early start-ups to publicly traded companies with market capitalizations of in excess of $1 billion. Previously, he served as chief operating officer ("COO") or CFO of four publicly traded and four privately held companies, including Seaside Therapeutics, Inc., where he served as COO from 2009 to 2011. In addition, he has been involved with multiple rare disease-focused companies in areas such as Huntington's disease, amyotrophic lateral sclerosis, fragile X syndrome, hemophilia A and Gaucher disease, including the approval of enzyme replacement therapies for the treatments of Fabry disease and Hunter syndrome. Mr. Geffken has raised more than $700 million in equity and debt securities. Mr. Geffken started his career as a C.P.A. at KPMG and, later, as a principal in a private equity firm. Mr. Geffken received his M.B.A from the Harvard Business School and his B.S. in economics from The Wharton School, University of Pennsylvania.

Director's Qualifications

In selecting a particular candidate to serve on our Board of Directors, we consider the needs of our company based on particular attributes that we believe would be advantageous for our Board members to have and would qualify such candidate to serve on our Board given our business profile and the environment in which we operate. The table below sets forth such attributes and identifies which attributes each director possesses.

Attributes	Mr. French	Dr. Loren	Mr. Ramelli	Mr. Ranker	Mr. Williams
Financial Experience	X	X	X	X	X
Public Board Experience	X	X		X	
Industry Experience	X	X		X	X
Scientific Experience		X			
Commercial Experience	X		X	X	X

Attributes	Mr. French	Dr. Loren	Mr. Ramelli	Mr. Ranker	Mr. Williams
Corporate Governance Experience	X	X		X	X
Capital Markets Experience	X	X	X	X	X
Management Experience	X	X	X	X	X

Certain Relationships and Related Transactions

J. Michael French. Pursuant to the terms and conditions of Mr. French's employment agreement, we agreed, for the term of Mr. French's employment with us, to nominate Mr. French for successive terms as a member of the Board of Directors, and to use all best efforts to cause Mr. French to be elected by our shareholders as a member of the Board of Directors.

Family Relationships

There are no familial relationships between any of our officers and directors.

Director or Officer Involvement in Certain Legal Proceedings

Our directors and executive officers were not involved in any legal proceedings as described in Item 401(f) of Regulation S-K in the past ten years.

Audit Committee

Our Audit Committee consists of Mr. Williams (chair) and Mr. Ramelli. The Audit Committee authorized and approved the engagement of the independent registered public accounting firm, reviewed the results and scope of the audit and other services provided by the independent registered public accounting firm, reviewed our financial statements, reviewed and evaluated our internal control functions, approved or established pre-approval policies and procedures for all professional audit and permissible non-audit services provided by the independent registered public accounting firm and reviewed and approved any proposed related party transactions.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires our executive officers and directors, and persons who own more than 10% of a registered class of our equity securities ("Reporting Persons"), to file reports of ownership and changes in ownership with the SEC and with NASDAQ. Based solely on our review of the reports filed by Reporting Persons, and written representations from certain Reporting Persons that no other reports were required for those persons, we believe that, during the year ended December 31, 2014, the Reporting Persons met all applicable Section 16(a) filing requirements, other than Mr. Geffken, who was not timely with respect to the filing of the Initial Statement of Beneficial Ownership of Securities on Form 3 necessitated by his appointment as our interim chief financial officer in May 2014, and Mr. Williams, who was not timely with respect to the Statement of Changes in Beneficial Ownership of Securities on Form 4 necessitated by the grant to him of options to purchase shares of our common stock on September 15, 2014.

Code of Ethics

We have adopted a Code of Business Conduct and Ethics that applies to all of our employees and officers, and the members of our Board of Directors. The Code of Business Conduct and Ethics is available on our corporate website at www.marinabio.com. You can access the Code of Business Conduct and Ethics on our website by first clicking "About Marina Biotech" and then "Corporate Governance." Printed copies are available upon request without charge. Any amendment to or waiver of the Code of Business Conduct and Ethics will be disclosed on our website promptly following the date of such amendment or waiver.

ITEM 11. *Executive Compensation.*

Summary of Executive Compensation

SUMMARY COMPENSATION TABLE

The following table sets forth information regarding compensation earned during 2014 and 2013 by our CEO and our other most highly compensated executive officers as of the end of the 2014 fiscal year ("Named Executive Officers").

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)	Option Awards ($)[3]	All Other Compensation ($)	Total ($)
J. Michael French,	2014	288,083[1]	—	—	774,929	—	1,063,012
President, CEO and Director	2013	127,500	—	—	—	—	127,500
Daniel E. Geffken,							
Interim CFO[2]	2014	—	—	—	—	136,422	136,422

(1) Although Mr. French's employment agreement provides for an annual base salary of $340,000, due to our company's financial challenges in 2012 and 2013 he worked for a reduced wage during a significant portion of each of those fiscal years. Mr. French agreed to settle outstanding compensation obligations with respect to the 2012 and 2013 fiscal years in the amount of $415,000 in return for the issuance of 1,130,000 shares of common stock. We approved the issuance of these shares to Mr. French, which were valued based on the volume weighted average price of our common stock for the ten trading days ending December 31, 2013 (i.e., $0.33), in January 2014.

(2) Mr. Geffken was appointed to serve as our interim chief financial officer on May 13, 2014. Mr. Geffken is compensated for his services in this position pursuant to a Consulting Agreement, effective as of January 9, 2014, that we entered into with Danforth Advisors, LLC ("Danforth"). Mr. Geffken is a founder and managing director at Danforth. We paid an aggregate amount of $299,947 to Danforth during the 2014 fiscal year pursuant to the terms of the Consulting Agreement, of which amount Danforth paid $136,422 to Mr. Geffken, with the remainder being paid by Danforth to third-party contractors who performed services under the Consulting Agreement or being utilized for entity expenses. Upon the effectiveness of the Consulting Agreement, we issued to Danforth 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and shall vest on a monthly basis over the two-year period beginning on the effective date of the Consulting Agreement.

(3) Represents the aggregate grant date fair value under FASB ASC Topic 718 of options to purchase shares of our common stock granted during 2014. On September 15, 2014, pursuant to the Amended and Restated Employment Agreement that we entered into with Mr. French, we granted ten-year options to Mr. French to purchase up to 771,000 shares of common stock at an exercise price of $1.07 per share, of which 257,000 options shall vest on the first anniversary of the grant date, and 514,000 options shall vest in 24 equal monthly installments commencing after the first anniversary of the grant date and shall be vested in full on the third anniversary of the grant date.

Narrative Disclosures Regarding Compensation; Employment Agreements

We have entered into an employment agreement with Mr. French, which was amended and restated on September 15, 2014, and a consulting agreement with Danforth, an entity controlled by Mr. Geffken. The terms and conditions of these agreements are summarized below.

J. Michael French Employment Agreement

On June 10, 2008, we entered into an employment agreement (the "Original French Agreement") with J. Michael French pursuant to which Mr. French served as our President and our CEO. The initial term began on June 23, 2008 and ended on June 9, 2011. Thereafter, it continued per its terms on a quarter-to-quarter basis. On September 15, 2014, we entered into an Amended and Restated Employment

Agreement (the "Restated French Agreement") with Mr. French pursuant to which Mr. French shall serve as our President and CEO until September 14, 2017. A copy of the Original French Agreement was filed as Exhibit 10.2 to our Current Report on Form 8-K dated June 10, 2008, and a copy of the Restated French Agreement was filed as Exhibit 10.1 to our Current Report on Form 8-K dated September 15, 2014.

Pursuant to the Original French Agreement, Mr. French was entitled to annual base compensation of $340,000, which amount was increased to $425,000 in the Restated French Agreement. He is also eligible to receive annual performance-based incentive cash compensation, with the targeted amount of such incentive cash compensation being 40% of his annual base compensation for the year under the Original French Agreement, and 50% of his annual base compensation for the year under the Restated French Agreement, but with the actual amount to be determined by the Board or the Compensation Committee.

We agreed in the Restated French Agreement to pay to Mr. French a lump sum within thirty (30) days following full execution of the Restated French Agreement, with such amount being the excess of Mr. French's base salary under the Restated French Agreement from April 1, 2014 through September 15, 2014, over whatever compensation we had paid to Mr. French as base salary during such period.

Under the Original French Agreement, we granted options to Mr. French to purchase up to 31,500 shares of common stock, of which 10,500 options were exercisable at $50.80 per share, 10,500 options were exercisable at $90.80 per share, and 10,500 options were exercisable at $130.80 per share. The options had a term of 10 years beginning on June 23, 2008. Mr. French has agreed to cancel these options effective as of December 31, 2014. Under the Restated French Agreement, we granted ten-year options to Mr. French to purchase up to 771,000 shares of common stock at an exercise price of $1.07 per share, of which 257,000 options shall vest on the first anniversary of the grant date, 257,000 options shall vest monthly in equal installments commencing after the first anniversary of the grant date and shall be vested in full on the second anniversary of the grant date, and 257,000 options shall vest monthly commencing after the second anniversary of the grant date and shall be vested in full on the third anniversary of the grant date.

If Mr. French's employment under the Restated French Agreement is terminated without cause or he chooses to terminate his employment for good reason, all of Mr. French's options that are outstanding on the date of termination shall be fully vested and exercisable upon such termination and shall remain exercisable for the remainder of their terms. In addition, he will receive (i) base salary, (ii) incentive cash compensation determined on a pro-rated basis as to the year in which the termination occurs, (iii) pay for accrued but unused paid time off, and (iv) reimbursement for expenses through the date of termination, plus an amount equal to 12 months of his specified base salary at the rate in effect on the date of termination.

If Mr. French's employment under the Restated French Agreement is terminated for cause or he chooses to terminate his employment other than for good reason, vesting of the options shall cease on the date of termination and any then unvested options shall terminate, however the then-vested options shall remain vested and exercisable for the remainder of their respective terms. He will also receive salary, pay for accrued but unused paid time off, and reimbursement of expenses through the date of termination.

If Mr. French's employment under the Restated French Agreement is terminated due to death or disability, Mr. French or his estate, as applicable, is entitled to receive (i) salary, reimbursement of expenses, and pay for accrued but unused paid time off; (ii) incentive cash compensation determined on a pro-rated basis as to the year in which the termination occurs; and (iii) a lump sum equal to base salary at the rate in effect on the date of termination for the lesser of (A) twelve (12) months and (B) the remaining term of the Employment Agreement at the time of such termination. In addition, vesting of all of Mr. French's options that are outstanding on the date of termination shall cease, and any then vested options shall remain exercisable as specified in the applicable grant agreements.

If Mr. French's employment under the Restated French Agreement is terminated by us (other than for cause) or by Mr. French (for good reason), and in either case other than because of death or disability, during the one-year period following a change in control of our company, then Mr. French will be entitled to receive as severance: (i) salary, expense reimbursement and pay for unused paid time off through the date of termination; and (ii) a lump-sum amount equal to twelve (12) months of base salary at the rate in effect on the date of termination. In addition, all of Mr. French's outstanding stock options shall be fully vested and exercisable upon a change of control and shall remain exercisable as specified in the option grant agreements.

Pursuant to the Restated French Agreement, a change in control generally means (i) the acquisition by any person or group of 40% or more of our voting securities, (ii) our reorganization, merger or consolidation, or sale of all or substantially all of our assets, following which our stockholders prior to the consummation of such transaction hold 60% or less of the voting securities of the surviving or acquiring entity, as applicable, (iii) a turnover of the majority of the Board as currently constituted, provided that under most circumstances any individual approved by a majority of the incumbent Board shall be considered as a member of the incumbent Board of Directors for this purpose, or (iv) a complete liquidation or dissolution of our company.

The Restated French Agreement also provides that we shall cause the nomination and recommendation of Mr. French for election as a director at the annual meetings of our stockholders that occur during the employment term, and use all best efforts to cause Mr. French to be elected as a non-independent director.

In general, Mr. French has agreed in the Restated French Agreement not to compete with us during the employment term and for six months thereafter, to solicit our partners, consultants or employees for one year following the end of the employment term, or to solicit our clients during the employment term and for twelve months thereafter.

Daniel E. Geffken Consulting Agreement

We have entered into a Consulting Agreement, effective as of January 9, 2014, with Danforth, pursuant to which we engaged Danforth to serve as an independent consultant for the purpose of providing us with certain strategic and financial advice and support services during the one-year period beginning on January 9, 2014. In January 2015, we extended the term of the Consulting Agreement to January 2016. Mr. Geffken, who was appointed to serve as our interim chief financial officer on May 13, 2014, is a founder and managing director at Danforth. We paid to Danforth approximately $299,947 during 2014, of which amount Danforth paid $136,422 to Mr. Geffken, with the remainder being paid by Danforth to third-party contractors who performed services under the Consulting Agreement or being utilized for entity expenses. We also issued to Danforth, upon the effectiveness of the consulting agreement, 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and shall vest on a monthly basis over the two-year period beginning on the effective date of the consulting agreement. The Consulting Agreement may be terminated by either party thereto: (a) with Cause (as defined below), upon thirty (30) days prior written notice; or (b) without Cause upon sixty (60) days prior written notice. “Cause” shall include: (i) a breach of the terms of the Consulting Agreement which is not cured within thirty (30) days of written notice of such default or (ii) the commission of any act of fraud, embezzlement or deliberate disregard of a rule or policy of our company.

Outstanding Equity Awards at Fiscal Year End

OUTSTANDING EQUITY AWARDS AT FISCAL YEAR-END TABLE

The following table sets forth information regarding the outstanding equity awards held by our Named Executive Officers as of the end of our 2014 fiscal year:

		Option Awards					Stock Awards			
Name		Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested ($)
J. Michael French . . .	(1)	—	771,000[2]	—	$1.07	9/15/24	—	—	—	—
Daniel E. Geffken . .	(3)	—	—	—	$ —	—	—	—	—	—

(1) As per an agreement between Mr. French and our company, options to purchase up to 88,972 shares of common stock previously granted to Mr. French were cancelled effective as of December 31, 2014.

(2) One-third of these options shall vest on September 15, 2015. The remaining options shall vest in 24 equal monthly installments during the two-year period commencing after September 15, 2015.

(3) Pursuant to the Consulting Agreement, effective as of January 9, 2014, that we entered into with Danforth, an entity controlled by Mr. Geffken, we issued to Danforth, upon the effectiveness of the Consulting Agreement, 10-year warrants to purchase up to 100,800 shares of our common stock, which warrants are exercisable at $0.481 per share and vest on a monthly basis over the two-year period beginning on January 9, 2014.

Option re-pricings

We have not engaged in any option re-pricings or other modifications to any of our outstanding equity awards to our Named Executive Officers during fiscal year 2014.

Compensation of Directors

Director Compensation Table

The following Director Compensation table sets forth information concerning compensation for services rendered by our independent directors for fiscal year 2014.

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)	Option Awards ($)[3]	All Other Compensation ($)	Total ($)
Stefan C. Loren, Ph.D.[1][2]	$ 32,500	—	$15,579	—	$ 48,079
Joseph W. Ramelli[1][2]	32,500	—	15,579	—	48,079
Philip C. Ranker[2]	32,500	—	15,579		48,079
Donald A. Williams[4]	22,500	—	15,579		38,079
Total	$120,000	—	$62,316	—	$182,316

(1) Due to our financial condition prior to March 2014, neither Dr. Loren nor Mr. Ramelli, each of whom was appointed in August 2012, received any cash payments during 2012 or 2013 in connection with their service to our company. However, in January 2014 we issued to each such non-employee director 151,000 shares of common stock in lieu of approximately $50,000 of fees otherwise due to such director with respect to his service on the Board representing approximately $10,000 of fees from the period August 2012 through December 2012 and approximately $40,000 of fees for 2013. The number of shares issued to each of Dr. Loren and Mr. Ramelli was based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33).

(2) On January 1, 2014, we issued 30,303 shares of our common stock to each of Dr. Loren, Mr. Ramelli and Mr. Ranker, in lieu of a cash payment in the amount of $10,000, as compensation for service on our Board of Directors during the first quarter of 2014. The number of shares issued to each director was based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33).

(3) Represents the aggregate grant date fair value under FASB ASC Topic 718 of options to purchase shares of our common stock granted during 2014. On September 15, 2014, we granted to each of our non-employee directors options to purchase up to an aggregate of 62,000 shares of our common stock at an exercise price of $1.07 per share, of which 43,000 options represented the initial option grant to such non-employee directors, and 19,000 options represented the option grant covering service during the third and fourth quarters of 2014.

(4) Mr. Williams became a member of our Board of Directors on September 15, 2014.

As of December 31, 2014, Dr. Loren, Mr. Ramelli and Mr. Williams each held options to purchase up to 62,000 shares of our common stock, and Mr. Ranker held options to purchase up to 64,500 shares of our common stock.

J. Michael French, current director, has not been included in the Director Compensation Table because he is a Named Executive Officer and does not receive any additional compensation for services provided as a director.

2014 Director Compensation Program: On January 1, 2014, our Board approved a compensation program for non-employee directors during the 2014 calendar year that consisted of an annual fee of $40,000, payable in advance. We paid the portion of this annual fee attributable to the first quarter of 2014 by the issuance of 30,303 shares of our common stock to each of our non-employee directors who served as members of our Board of Directors during the first quarter of 2014, with the number of shares issued to each director being based on the volume weighted average price of our common stock for the 10-trading day period ending on December 31, 2013 (i.e., $0.33). On September 15, 2014, the Board revised the compensation program for non-employee directors, effective starting in the third quarter of 2014, so that it would consist of: (i) an initial grant of 5-year options to purchase up to 43,000 shares of our common stock, which options shall vest 50% immediately and 50% after one year; (ii) an annual grant of 5-year options to purchase up to 38,000 shares of our common stock, which options shall vest 50% immediately and 50% after one year; and (iii) an annual cash payment of $45,000 per year, payable quarterly in advance.

ITEM 12. *Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.*

The following table sets forth certain information regarding the ownership of our common stock as of February 17, 2015 (the "Determination Date") by: (i) each current director of our company; (ii) each of our Named Executive Officers; (iii) all current executive officers and directors of our company as a group; and (iv) all those known by us to be beneficial owners of more than five percent (5%) of our common stock.

Beneficial ownership and percentage ownership are determined in accordance with the rules of the SEC. Under these rules, beneficial ownership generally includes any shares as to which the individual or entity has sole or shared voting power or investment power and includes any shares that an individual or entity has the right to acquire beneficial ownership of within 60 days of the Determination Date, through the exercise of any option, warrant or similar right (such instruments being deemed to be "presently

exercisable"). In computing the number of shares beneficially owned by a person and the percentage ownership of that person, shares of our common stock that could be issued upon the exercise of presently exercisable options and warrants are considered to be outstanding. These shares, however, are not considered outstanding as of the Determination Date when computing the percentage ownership of each other person.

To our knowledge, except as indicated in the footnotes to the following table, and subject to state community property laws where applicable, all beneficial owners named in the following table have sole voting and investment power with respect to all shares shown as beneficially owned by them. Percentage of ownership is based on 25,525,716 shares of common stock outstanding as of the Determination Date. Unless otherwise indicated, the business address of each person in the table below is c/o Marina Biotech, Inc., P.O. Box 1559, Bothell, WA 98041. No shares identified below are subject to a pledge.

Name	Number of Shares	Percent of Shares Outstanding (%)
Officers and Directors:		
J. Michael French, Director, President and CEO	822,283[1]	3.2%
Stefan C. Loren, Ph.D., Director	244,835[2]	*
Joseph W. Ramelli, Director	267,103[3]	1.0%
Philip C. Ranker, Director	962,553[4]	3.8%
Donald A. Williams, Director	59,500[5]	*
Daniel E. Geffken, Interim CFO	63,000[6]	*
All directors and executive officers as a group (6 persons)	2,419,274[7]	9.4%

* Beneficial ownership of less than 1.0% is omitted.

(1) Pursuant to a settlement agreement, certain securities beneficially owned by Mr. French are held in constructive trust by Mr. French for the benefit of Mr. French and his former spouse.

(2) Includes presently exercisable options to purchase 59,500 shares of common stock and presently exercisable warrants to purchase 4,032 shares of common stock.

(3) Includes presently exercisable options to purchase 59,500 shares of common stock.

(4) Includes presently exercisable options to purchase 62,000 shares of common stock.

(5) Consists of presently exercisable options to purchase 59,500 shares of common stock.

(6) Consists of presently exercisable warrants to purchase up to 58,800 shares of common stock issued to Danforth.

(7) Includes presently exercisable options to purchase 240,500 shares of common stock and presently exercisable warrants to purchase 67,032 shares of common stock.

EQUITY COMPENSATION PLAN INFORMATION

The following table provides aggregate information as of December 31, 2014 with respect to all of the compensation plans under which our common stock is authorized for issuance, including our 2004 Stock Incentive Plan (the "2004 Plan"), our 2008 Stock Incentive Plan (the "2008 Plan") and our 2014 Long-Term Incentive Plan (the "2014 Plan"):

	Number of Securities to be Issued Upon Exercise of Outstanding Options	Weighted-Average Exercise Price of Outstanding Options	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a))
Equity compensation plans approved by security holders	1,084,106[1]	5.52	8,412,519
Total	1,084,106	5.52	8,412,519

(1) Consists of: (i) 106 shares of common stock underlying awards made pursuant to the 2004 Plan, (ii) 45,000 shares of common stock underlying awards made pursuant to the 2008 Plan and (iii) 1,039,000 shares of common stock underlying awards made pursuant to the 2014 Plan.

ITEM 13. ***Certain Relationships and Related Transactions, and Director Independence.***

APPROVAL FOR RELATED PARTY TRANSACTIONS

It has been our practice and policy to comply with all applicable laws, rules and regulations regarding related-person transactions. Our Code of Business Conduct and Ethics requires that all employees, including officers and directors, disclose to the CFO the nature of any company business that is conducted with any related party of such employee, officer or director (including any immediate family member of such employee, officer or director, and any entity owned or controlled by such persons). If the transaction involves an officer or director of our company, the CFO must bring the transaction to the attention of the Audit Committee or, in the absence of an Audit Committee the full Board, which must review and approve the transaction in writing in advance. In considering such transactions, the Audit Committee (or the full Board, as applicable) takes into account the relevant available facts and circumstances.

INDEPENDENCE OF THE BOARD OF DIRECTORS

The Board of Directors utilizes NASDAQ's standards for determining the independence of its members. In applying these standards, the Board considers commercial, industrial, banking, consulting, legal, accounting, charitable and familial relationships, among others, in assessing the independence of directors, and must disclose any basis for determining that a relationship is not material. The Board has determined that three (3) of its current members, namely Stephen Loren, Ph.D., Joseph W. Ramelli and Donald A. Williams, are independent directors within the meaning of the NASDAQ independence standards, and that two (2) of its current members, namely J. Michael French and Philip C. Ranker, are not independent directors within the meaning of the NASDAQ independence standards. In making these independence determinations, the Board did not exclude from consideration as immaterial any relationship potentially compromising the independence of any of the above directors.

ITEM 14. ***Principal Accounting Fees and Services.***

Wolf & Company, P.C. has served as our independent registered public accounting firm since May 2014. KPMG LLP previously served as the principal accountants for our company.

Total fees to our independent registered public accounting firms for the years ended December 31, 2014 and 2013 were $0.124 million and $0.081 million, respectively, and were comprised of the amounts set forth below.

Audit Fees. The aggregate fees for professional services rendered in connection with: (i) the audit of our annual financial statements and (ii) the review of the financial statements included in our Quarterly Reports on Form 10-Q for the quarters ended March 31, June 30 and September 30 were $0.096 million for the year ended December 31, 2014 and $0.081 million for the year ended December 31, 2013.

Audit-Related Fees. The aggregate fees for professional services rendered in connection with consents and services provided in connection with statutory and regulatory filings or engagements were $0.028 million for the year ended December 31, 2014. We did not incur any fees related to audits for the year ended December 31, 2013.

Tax Fees. We did not incur any fees to our independent registered public accounting firm for professional services rendered in connection with tax compliance, tax planning and federal and state tax advice for the years ended December 31, 2014 and December 31, 2013.

All Other Fees. We did not incur any such other fees to our independent registered public accounting firm for the years ended December 31, 2014 and December 31, 2013.

PRE-APPROVAL POLICIES AND PROCEDURES

The Audit Committee has the authority to appoint or replace our independent registered public accounting firm (subject, if applicable, to stockholder ratification). The Audit Committee is also responsible for the compensation and oversight of the work of the independent registered public accounting firm (including resolution of disagreements between management and the independent registered public accounting firm regarding financial reporting) for the purpose of preparing or issuing an audit report or related work. The independent registered public accounting firm was engaged by, and reports directly to, the Audit Committee.

The Audit Committee pre-approves all audit services and permitted non-audit services (including the fees and terms thereof) to be performed for us by our independent registered public accounting firm, subject to the *de minimis* exceptions for non-audit services described in Section 10A(i)(1)(B) of the Exchange Act and SEC Rule 2-01(c)(7)(i)(C) of Regulation S-X, provided that all such excepted services are subsequently approved prior to the completion of the audit. In the event pre-approval for such audit services and permitted non-audit services cannot be obtained as a result of inherent time constraints in the matter for which such services are required, the Chairman of the Audit Committee had been granted the authority to pre-approve such services, provided that the estimated cost of such services on each such occasion does not exceed $15,000, and the Chairman of the Audit Committee reported for ratification such pre-approval to the Audit Committee at its next scheduled meeting. We have complied with the procedures set forth above, and the Audit Committee has otherwise complied with the provisions of its charter.

PART IV

ITEM 15. ***Exhibits, Consolidated Financial Statement Schedules.***

(a)(1) *Consolidated Financial Statements and Consolidated Financial Statement Schedule*

The consolidated financial statements listed in the Index to Financial Statements are filed as part of this Form 10-K.

(a)(3) *Exhibits*

The exhibits required by this item are set forth on the Exhibit Index attached hereto.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, State of Massachusetts, on February 17, 2015.

MARINA BIOTECH, INC.

By: /s/ J. Michael French
J. Michael French
Director, President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed by the following persons on behalf of the Registrant and in the capacities indicated on February 17, 2015.

Signature	Title
/s/ J. Michael French J. Michael French	Chairman of the Board, President and Chief Executive Officer (Principal Executive Officer and Principal Financial Officer)
/s/ Philip C. Ranker Philip C. Ranker	Director
/s/ Stefan C. Loren Stefan C. Loren, Ph.D.	Director
/s/ Joseph W. Ramelli Joseph W. Ramelli	Director
/s/ Donald A. Williams Donald A. Williams	Director

EXHIBIT INDEX

Exhibit No.	Description
2.1	Agreement and Plan of Merger dated as of March 31, 2010 by and among the Registrant, Cequent Pharmaceuticals, Inc., Calais Acquisition Corp. and a representative of the stockholders of Cequent Pharmaceuticals, Inc. (filed as Exhibit 2.1 to our Current Report on Form 8-K dated March 31, 2010, and incorporated herein by reference).
3.1	Restated Certificate of Incorporation of the Registrant dated July 20, 2005 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated July 20, 2005, and incorporated herein by reference).
3.2	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant, dated June 10, 2008 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated June 10, 2008, and incorporated herein by reference).
3.3	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant, dated July 21, 2010 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated July 21, 2010, and incorporated herein by reference).
3.4	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant, dated July 21, 2010 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated July 21, 2010, and incorporated herein by reference).
3.5	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant, dated July 18, 2011 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated July 14, 2011, and incorporated herein by reference).
3.6	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of the Registrant, dated December 22, 2011 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated December 22, 2011, and incorporated herein by reference).
3.7	Amended and Restated Bylaws of the Registrant dated August 21, 2012 (filed as Exhibit 3.7 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, and incorporated herein by reference).
3.8	Certificate of Designation, Rights and Preferences of Series A Junior Participating Preferred Stock dated January 17, 2007 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated January 19, 2007, and incorporated herein by reference).
3.9	Amended Designation, Rights, and Preferences of Series A Junior Participating Preferred Stock, dated June 10, 2008 (filed as Exhibit 3.2 to our Current Report on Form 8-K dated June 10, 2008, and incorporated herein by reference).
3.10	Certificate of Designations or Preferences, Rights and Limitations of Series B Preferred Stock dated December 22, 2011 (filed as Exhibit 3.1 to our Current Report on Form 8-K dated December 22, 2011, and incorporated herein by reference).
3.11	Certificate of Designation of Rights, Preferences and Privileges of Series C Convertible Preferred Stock (filed as Exhibit 3.1 to our Current Report on Form 8-K dated March 7, 2014, and incorporated herein by reference).
4.1	Form of Amended and Restated Common Stock Purchase Warrant originally issued by the Registrant in April 2008 (filed as Exhibit 10.2 to our Quarterly Report on Form 10-Q for the quarter ended June 30, 2009, and incorporated herein by reference).
4.2	Form of Common Stock Purchase Warrant issued by the Registrant in June 2009 (filed as Exhibit 10.3 to our Current Report on Form 8-K dated June 10, 2009, and incorporated herein by reference).
4.3	Form of Common Stock Purchase Warrant issued by the Registrant in December 2009 (filed as Exhibit 4.2 to our Current Report on Form 8-K dated December 22, 2009, and incorporated herein by reference).
4.4	Form of Common Stock Purchase Warrant issued by the Registrant in January 2010 (filed as Exhibit 4.1 to our Current Report on Form 8-K dated January 13, 2010, and incorporated herein by reference).

Exhibit No.	Description
4.5	Form of Common Stock Purchase Warrant issued by the Registrant in November 2010 (filed as Exhibit 4.2 to our Current Report on Form 8-K dated November 4, 2010, and incorporated herein by reference).
4.6	Form of Warrant Certificate issued by the Registrant in February 2011 (filed as Exhibit 4.1 to our Current Report on Form 8-K dated February 10, 2011, and incorporated herein by reference).
4.7	Form of Warrant Agreement by and between the Registrant and American Stock Transfer & Trust Company, LLC (filed as Exhibit 4.2 to our Current Report on Form 8-K dated February 10, 2011, and incorporated herein by reference).
4.8	Form of Series A Warrant (Common Stock Purchase Warrant) issued to the investors in the Registrant's underwritten offering of securities that closed in May 2011 (filed as Exhibit 4.13 to Amendment No. 2 to our Registration Statement on Form S-1 (No. 333-173108) filed with the SEC on May 10, 2011, and incorporated herein by reference).
4.9	Form of 15% Secured Promissory Note issued by the Registrant in February 2012 (filed as Exhibit 4.1 to our Current Report on Form 8-K dated February 10, 2012, and incorporated herein by reference).
4.10	Form of Common Stock Purchase Warrant issued by the Registrant to the holders of the 15% Secured Promissory Notes (filed as Exhibit 4.2 to our Current Report on Form 8-K dated February 10, 2012, and incorporated herein by reference).
4.11	Form of Common Stock Purchase Warrant issued by the Registrant in March 2012 (filed as Exhibit 4.1 to our Current Report on Form 8-K dated March 19, 2012, and incorporated herein by reference).
4.12	Form of Common Stock Purchase Warrant issued by the Registrant in March 2014 (filed as Exhibit 4.1 to our Current Report on Form 8-K dated March 7, 2014, and incorporated herein by reference).
10.1	Employment Agreement effective as of June 23, 2008 by and between the Registrant and J. Michael French (filed as Exhibit 10.2 to our Current Report on Form 8-K dated June 10, 2008, and incorporated herein by reference).**
10.2	Letter Agreement, dated August 7, 2012, between the Registrant and J. Michael French (filed as Exhibit 10.2 to our Current Report on Form 8-K dated August 2, 1012, and incorporated herein by reference).**
10.3	The Registrant's 2004 Stock Incentive Plan (filed as Exhibit 99 to our Registration Statement on Form S-8, File No. 333-118206, and incorporated herein by reference).**
10.4	Amendment No. 1 to the Registrant's 2004 Stock Incentive Plan (filed as Exhibit 10.4 to our Current Report on Form 8-K dated July 20, 2005, and incorporated herein by reference).**
10.5	Amendment No. 2 to the Registrant's 2004 Stock Incentive Plan (filed as Exhibit 10.18 to our Quarterly Report on Form 10-Q for the quarter ended September 30, 2005, and incorporated herein by reference).**
10.6	Amendment No. 3 to the Registrant's 2004 Stock Incentive Plan (filed as Exhibit 10.24 to our Annual Report on Form 10-K for the year ended December 31, 2005, and incorporated herein by reference).**
10.7	Amendment No. 4 to the Registrant's 2004 Stock Incentive Plan (filed as Exhibit 10.5 to our Registration Statement on Form S-8, File No 333-135724, and incorporated herein by reference).**
10.8	Amendment No. 5 to the Registrant's 2004 Stock Incentive Plan (filed as Exhibit 10.27 to our Quarterly Report on Form 10-K for the quarter ended September 30, 2006, and incorporated herein by reference).**
10.9	The Registrant's 2008 Stock Incentive Plan (filed as Appendix A to our Definitive Proxy Statement on Schedule 14A filed on April 29, 2008, and incorporated herein by reference).**

Exhibit No.	Description
10.10	License Agreement dated as of March 20, 2009 by and between Novartis Institutes for BioMedical Research, Inc. and the Registrant (filed as Exhibit 10.3 to our Quarterly Report on Form 10-Q/A for the quarter ended March 31, 2009, and incorporated herein by reference).[(1)]
10.11	License Agreement, effective as of December 22, 2011, by and between the Registrant and Mirna Therapeutics, Inc. (filed as Exhibit 10.3 to our Current Report on Form 8-K/A filed on February 22, 2012, and incorporated herein by reference).[(1)]
10.12	Note and Warrant Purchase Agreement, dated as of February 10, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified in the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated February 10, 2012, and incorporated herein by reference).
10.13	First Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated April 30, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.80 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, and incorporated herein by reference).
10.14	Second Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated May 31, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.81 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, and incorporated herein by reference).
10.15	Third Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated August 3, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated August 2, 2012, and incorporated herein by reference).
10.16	Fourth Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated October 4, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated October 4, 2012, and incorporated herein by reference).
10.17	Fifth Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated February 7, 2013, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated February 7, 2013, and incorporated herein by reference).
10.18	Sixth Amendment to Note and Warrant Purchase Agreement and Secured Promissory Notes, dated August 9, 2013, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc., and the purchasers identified on the signature pages thereto (filed as Exhibit 10.43 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2012, and incorporated herein by reference).
10.19	Security Agreement, dated as of February 10, 2012, among the Registrant, Cequent Pharmaceuticals, Inc., MDRNA Research, Inc. and Genesis Capital Management, LLC (filed as Exhibit 10.2 to our Current Report on Form 8-K dated February 10, 2012, and incorporated herein by reference).
10.20	Intellectual Property Security Agreement, dated as of February 10, 2012, by the Registrant, Cequent Pharmaceuticals, Inc. and MDRNA Research, Inc. in favor of Genesis Capital Management, LLC (filed as Exhibit 10.3 to our Current Report on Form 8-K dated February 10, 2012, and incorporated herein by reference).
10.21	Form of Securities Purchase Agreement, dated as of March 19, 2012, between and among the Registrant and the purchasers identified on the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated March 19, 2012, and incorporated herein by reference).

Exhibit No.	Description
10.22	Placement Agent Agreement, dated March 19, 2012, between the Registrant and Rodman & Renshaw, LLC (filed as Exhibit 10.2 to our Current Report on Form 8-K dated March 19, 2012, and incorporated herein by reference).
10.23	Exclusive License Agreement, effective as of March 13, 2012, by and between the Registrant and ProNAi Therapeutics, Inc. (filed as Exhibit 10.2 to our Current Report on Form 8-K/A dated March 13, 2012, and incorporated herein by reference).(1)
10.24	Term Sheet for Convertible Preferred Stock Financing (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K dated February 23, 2014, and incorporated herein by reference).
10.25	Securities Purchase Agreement, dated as of March 7, 2014, between and among the Registrant and each purchaser identified on the signature pages thereto (filed as Exhibit 10.1 to our Current Report on Form 8-K dated March 7, 2014, and incorporated herein by reference).
10.26	Consulting Agreement, dated as of January 9, 2014, by and between the Registrant and Danforth Advisors, LLC (filed as Exhibit 10.51 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2012, and incorporated herein by reference).**
10.27	Amended And Restated Employment Agreement, effective as of September 15, 2014, by and between the Registrant and J. Michael French (filed as Exhibit 10.1 to our Current Report on Form 8-K dated September 15, 2014, and incorporated herein by reference).**
10.28	2014 Long-Term Incentive Plan of the Registrant (filed as Exhibit 10.2 to our Current Report on Form 8-K dated September 15, 2014, and incorporated herein by reference).**
21.1	Subsidiaries of the Registrant.(2)
23.1	Consent of Wolf & Company, P.C., independent registered public accounting firm.(2)
31.1	Certification of our Principal Executive Officer and Principal Financial Officer pursuant to Rule 13a-14 and 15d-14 under the Securities Exchange Act of 1934, as amended.(2)
32.1	Certification of our Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.(3)
101INS	XBRL Instance Document(3)
101SCH	XBRL Taxonomy Extension Schema Document(3)
101CAL	XBRL Taxonomy Extension Calculation Linkbase Document(3)
101DEF	XBRL Taxonomy Extension Definition Linkbase Document(3)
101LAB	XBRL Taxonomy Extension Label Linkbase Document(3)
101PRE	XBRL Taxonomy Extension Presentation Linkbase Document(3)

(1) Portions of this exhibit have been omitted pursuant to a request for confidential treatment under Rule 24b-2 of the Securities Exchange Act of 1934, amended, and the omitted material has been separately filed with the SEC.

(2) Filed herewith.

(3) Furnished herewith.

** Indicates management contract or compensatory plan or arrangement.