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

FORM 10-K

☑ Annual report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the year ended December 31, 2016
or
☐ Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
Commission File Number: 001-37566

Mirna Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**26-1824804**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

1250 South Capital of Texas Highway
Austin, TX 78746
(Address of principal executive offices and zip code)
(512) 901-0950
(Registrant's telephone number, including area code)

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

Title of each class	**Name of exchange on which registered**
Common Stock, par value $0.001 per share	NASDAQ Stock Market LLC

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

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 of 1934 (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 Exchange Act 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 website, 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 ☑ 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 common stock held by non-affiliates computed by reference to the last reported sale price on June 30, 2016 was approximately $60.5 million.

As of March 3, 2017, there were 20,856,693 shares of the registrant's Common Stock outstanding.

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MIRNA THERAPEUTICS, INC.
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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements concerning our business, operations and financial performance and condition, as well as our plans, objectives and expectations for our business operations and financial performance and condition. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "aim," "anticipate," "assume," "believe," "contemplate," "continue," "could," "due," "estimate," "expect," "goal," "intend," "may," "objective," "plan," "predict," "potential," "positioned," "seek," "should," "target," "will," "would," and other similar expressions that are predictions or indicate future events and future trends, or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements regarding:

- our evaluation of strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company;
- the initiation, cost, timing, progress and results of any research and development activities;
- our ability to obtain funding for our operations;
- our ability to attract collaborators with development, regulatory and/or commercialization expertise;
- our ability to maintain intellectual property protection for our product candidates;
- regulatory developments in the United States and foreign countries;
- the performance of our third-party suppliers and manufacturers;
- the success of competing therapies that are or become available;
- our ability to retain key scientific or management personnel;
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act; and
- the accuracy of our estimates regarding expenses, future revenues, capital requirements and need for additional financing.

These forward-looking statements are based on management's current expectations, estimates, forecasts, and projections about our business and the industry in which we operate and management's beliefs and assumptions and are not guarantees of future performance or development and involve known and unknown risks, uncertainties, and other factors that are in some cases beyond our control. As a result, any or all of our forward-looking statements in this Annual Report on Form 10-K may turn out to be inaccurate. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under Item 1A. "Risk Factors" and elsewhere in this Annual Report on Form 10-K. These forward-looking statements speak only as of the date of this Annual Report on Form 10-K. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future. Given these risks and uncertainties, you are cautioned not to place undue reliance on such forward-looking statements.

PART I

ITEM 1. BUSINESS

Overview

We are a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics, which are short ribonucleic acid, or RNA, molecules, or oligonucleotides.

Our first product candidate, MRX34, a mimic of naturally occurring microRNA 34 (miR 34) encapsulated in a liposomal nanoparticle formulation, was studied as a single agent in a Phase 1 clinical trial. In September 2016, we voluntarily halted the Phase 1 trial following multiple immune-related serious adverse events, or SAEs, observed in patients dosed with MRX34 in the trial. Subsequently, we received notification from the U.S. Food and Drug Administration, or the FDA, that the Investigational New Drug Application, or IND, for MRX34 is on full clinical hold. Following our suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, we discontinued development of MRX34 and our microRNA product pipeline.

In November 2016, we discontinued research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. We also initiated a plan in November 2016 to reduce personnel and expenses to preserve capital and further streamline our operations consistent with our decision to discontinue development of MRX34 and our microRNA product pipeline. We expect to devote significant time and resources to identifying and evaluating strategic alternatives, however, there can be no assurance that such activities will result in any agreements or transactions that will enhance shareholder value. Further, any strategic transaction that is completed ultimately may not deliver the anticipated benefits or enhance shareholder value.

We were incorporated in 2007 under the laws of Delaware and were maintained as a wholly-owned subsidiary of our former parent company, Asuragen, Inc., or Asuragen, until the end of 2009, when we became an independent entity.

Our Strategy

Our corporate strategy currently is focused on pursuing strategic initiatives to enhance stockholder value. We have implemented operating cost reductions, organizational restructuring, including a recent reduction in our workforce, to reduce overall cash burn and facilitate our pursuit of strategic initiatives. We have engaged a financial and strategic advisor to explore a range of alternatives to enhance stockholder value, including but not limited to a merger or the sale of the Company. Our strategic process is both active and ongoing and includes a range of interactions with transaction counterparties. Thus, we believe it is in our stockholders' best interest to allow sufficient opportunity to pursue and consummate one or more such transactions and to consider additional alternatives that may materialize in the future before making a decision regarding a liquidation of the Company.

Our Historical microRNA Platform

More than 10 years ago, while working at Ambion®, our scientists discovered through extensive microRNA expression and functional assay work that microRNAs are expressed differently in cancer tissue compared to normal adjacent tissue and that several naturally occurring microRNAs function as tumor suppressors by regulating the expression of key oncogenes and preventing the development, progression and dissemination of cancer.

To enable therapeutic application of these tumor suppressor microRNAs, we pioneered technologies for creating RNA molecules that function as natural microRNAs when they enter human cells. These RNA molecules, which we call microRNA mimics, may be used to replace those tumor suppressor microRNAs that are lost, or under-expressed, in cancer cells. We pioneered the development of therapeutic miRNA mimics that feature two complementary RNA strands that are hybridized to produce a double-stranded RNA. The active strand has a sequence that is identical to a microRNA normally expressed in a cell, while the second, passenger strand is modified to facilitate proper loading of the active strand onto the cytoplasmic protein complex necessary for microRNA function inside the cells. While similar in structure, microRNA mimics are clearly differentiated from small interfering RNAs (siRNAs) through their biological heritage and activity. In contrast to the man-made sequences of siRNAs that target a single gene, microRNA mimics function like naturally occurring microRNAs to orchestrate the expression of many different genes to enable normal cell development and function. We believe our microRNA mimics have the mechanistic flexibility to be used as:

- first-line agents in combination with current standards of care, including targeted therapies, immuno-oncology therapies, chemotherapies and/or radiation therapies;
- monotherapies in advanced or refractory patient settings;

- monotherapies in patients who would be intolerant of current standards of care; and
- monotherapies in tumor settings that do not have any approved therapies.

Delivery of microRNA Mimics to Target Tissues

Systemic delivery of oligonucleotides, including microRNAs, has been a major challenge, principally due to the fact that after intravenous administration these molecules have to overcome multiple barriers before reaching their ultimate place of action, which is the RNA-induced silencing complex (RISC) in the cytoplasm of cells.

We have evaluated a wide variety of proprietary delivery systems with our microRNA compounds for *in vivo* and *ex vivo* testing. Based on this testing, we previously selected SMARTICLES® formulation technology, licensed from Marina Biotech, Inc. as the delivery technology for miR-34. miR-34 was the target tumor suppressor microRNA of our first product candidate MRX34. In September 2016, the FDA placed the IND for MRX34 on full clinical hold and we have discontinued development of MRX34 and our microRNA product pipeline.

Product Pipeline

In November 2016, we discontinued research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. Prior to discontinuing our research and development activities, we were developing a pipeline of tumor suppressor microRNA mimics. Each microRNA mimic in our pipeline was designed to replicate the activity of a single tumor suppressor miRNA and regulate the expression of key oncogenes across multiple oncogenic pathways. We were granted therapeutic use patent claims related to several tumor suppressor microRNAs as well as composition of matter claims for multiple chemistries and structures.

Through execution of our *in silico*, *in vitro* and *in vivo* analysis of multiple tumor suppressor microRNAs we previously prioritized a pipeline of candidate molecules for further validation toward clinical candidate nomination. Before we discontinued our research and development activities in November 2016, each of these candidates was previously studied for therapeutic potential in specific cancer indications, as set forth in the table below:

MicroRNAPROGRAM	KEY ONCOGENE TARGETS	PATHWAYS	CANCER INDICATION
miR-215	BCL2, BMI1, DHFR, IGF, IGFR1, MDM2, PIM1, WNK1, XIAP, ZEB1/2	Cell Cycle, Apoptosis, DNA Repair, EMT	Esophageal, Kidney, Multiple Myeloma
miR-101	MYCN, EZH2, ERK2, FOS, MCL1, COX2, DNMT3A, VEGF, MET, ZEB1/2	Angiogenesis, Cell Cycle, Apoptosis, EMT, Inflammation	Bladder, Gastric, Lung, Ovarian
miR-16	BCL2, VEGF-A, Cyclin-D1, HMGA1, FGFR1, CDK6, BMI1	Apoptosis, Autophagy, Angiogenesis, EMT, Cell Cycle	Chronic Lymphocytic Leukemia, Lymphoma
let-7	RAS, MYC, HMGA2, TGFBR1,MYCN, Cyclin D2, IL6, ITGB3	Cell Cycle, Angiogenesis, Cancer Stem Cell, EMT	Prostate, Pancreatic, Melanoma

MRX34

MRX34 is a double-stranded RNA mimic of the tumor suppressor microRNA, miR-34, encapsulated in a liposomal nanoparticle formulation called SMARTICLES. Based on preclinical data and a potential new mechanism for the treatment of cancer, we opened IND applications in the United States and Korea and initiated our first-in-human Phase 1 clinical trial, titled MRX34-101. However, in September 2016, we voluntarily halted the Phase 1 trial following multiple immune-related SAEs observed in patients dosed with MRX34 over the course of the trial. Three of these immune-related events resulted in the patient's death. Subsequently, we received notification from the FDA that the IND for MRX34 is on full clinical hold. Following our suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, we discontinued development of MRX34 and our microRNA product pipeline.

Intellectual Property

We have previously worked to protect and enhance the proprietary technologies that we believed were important to our business, including seeking and maintaining patents intended to cover our products and compositions, their methods of use and

any other inventions important to the development of our business. We have also relied on trade secrets to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection.

Our Patent Portfolio

We own or in-license a portfolio of patents and patent applications that has protected various aspects of our business. The patents and patent applications that make up our patent portfolio have been primarily focused on various aspects of microRNA therapeutics. As of December 31, 2016, we own or in-licensed over 10 issued U.S. patents and over 42 pending U.S. and ex-U.S. patent applications. The expiration dates of the currently issued patents range from 2025 to 2032. We also have multiple pending patent applications that, if issued, will expire between 2025 and 2035.

Patent Term

The term of individual patents and patent applications in our portfolio will depend upon the legal term of the patents in the countries in which they are obtained. In most countries, the patent term is 20 years from the date of filing of the patent application (or parent application, if applicable). For example, if an international Patent Cooperation Treaty, or PCT, application is filed, any patent issuing from the PCT application in a specific country expires 20 years from the filing date of the PCT application. In the United States, however, if a patent was in force on June 8, 1995, or issued on an application that was filed before June 8, 1995, that patent will generally have a term that is the greater of twenty years from the filing date or 17 years from the date of issue.

Under the Hatch-Waxman Act, the term of a patent that covers an FDA-approved drug or biological product may also be eligible for patent term extension, or PTE. PTE permits restoration of a portion of the patent term of a U.S. patent as compensation for the patent term lost during product development and the FDA regulatory review process if approval of the application for the product is the first permitted commercial marketing of a drug or biological product containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of an IND and the submission date of a new drug application, or NDA, plus the time between the submission date of an NDA and the approval of that application. The Hatch-Waxman Act permits the owner of a patent to apply for a PTE for only one patent applicable to an approved drug, and the maximum period of restoration is five years beyond the expiration of the patent. A PTE cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, and a patent can only be extended once, and thus, even if a single patent is applicable to multiple products, it can only be extended based on one product. Similar provisions may be available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug. When possible, depending upon the length of clinical trials and other factors involved in the filing of an NDA, we expect to apply for PTEs for patents covering our product candidates and their methods of use, or to work with our licensors, as owners of such patents, to obtain such extensions, if available.

Strategic Partnerships and Licenses

CPRIT

In August 2010, we entered into a grant contract with the Cancer Prevention and Research Institute of Texas (CPRIT), under which we received a $10.3 million commercialization award from the State of Texas through CPRIT. CPRIT was established to expedite innovation and commercialization in the area of cancer research and to enhance access to evidence-based prevention programs and services throughout the State of Texas. The award was a three-year award that was funded annually, and the contract terminated on January 31, 2014, subject to our obligations to make certain payments that survive termination. Under the terms of the award, we will be required to pay to CPRIT a portion of our revenues from sales of certain products by us, or received from our licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to our right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. The 2010 grant contract also contains a provision that provides for repayment to CPRIT some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas.

On September 1, 2015, we entered into a new grant contract with CPRIT in connection with an approximately $16.8 million award, subject to extension by mutual agreement by us and CPRIT. In October 2015, concurrent with our IPO, we realized this 2015 award in the form of an agreement by CPRIT to purchase approximately $16.8 million of shares of our common stock in a private placement. In contrast to our 2010 award, this 2015 award does not include any royalty obligation upon commercialization of our product candidates, nor are we required to repay the grant proceeds under specified circumstances. Pursuant to this grant contract, we will conduct preclinical and clinical development of certain combination therapy approaches for lung or liver cancer involving MRX34. If, at any time during the term of the grant contract, we determine that the project provided for by the grant

contract is no longer commercially feasible for us, then we and CPRIT are required to consult in order to reallocate the remaining unspent budget for the project to another oncology project in our product candidate pipeline.

Manufacturing

In November 2016, we discontinued further research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. We do not currently own or operate facilities for product manufacturing, storage and distribution or testing and we have previously contracted with third parties to manufacture our compounds for nonclinical and clinical testing purposes.

Manufacturing is subject to extensive regulations that impose various procedural and documentation requirements, which govern recordkeeping, manufacturing processes and controls, personnel, quality control and quality assurance. If we resume research and development activities, our systems and contractors would be required to be in compliance with these regulations.

Drug Substance

Following our suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, we discontinued development of MRX34 and our microRNA product pipeline; however, we previously used NITTO DENKO Avecia, or Avecia, to manufacture our MRX34 drug substance.

Drug Product

Our drug product for our microRNA mimics consists of the drug substance formulated in the SMARTICLES liposomal delivery system. The drug product was provided as a concentrated, frozen aqueous solution that was defrosted, thawed and diluted for infusion in the clinic. The exclusive manufacturer of drug product for MRX34 was Polymun; however, this product candidate has been discontinued and we have disposed of all of our finished product that was outstanding.

Research and Development

In November 2016, we discontinued our research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. Before we discontinued our research and development activities, we conducted clinical trials and other development activities to support the development of our product candidates. In the years ended December 31, 2016, 2015 and 2014, we incurred $13.9 million, $18.9 million, and $10.5 million, respectively, of research and development expense.

Before we discontinued our research and development activities, our research programs were directed towards the following:

- Determining if biomarkers can be used to select cancer patients who are more likely to respond to MRX34 therapy.
- Selecting and developing a second miRNA-based therapeutic candidate.
- Developing a next-generation systemic delivery technology that will improve the tolerability and efficacy profiles of miRNA mimics and expand the cancer indications that can be targeted for therapeutic intervention.

Competition

The biotechnology and pharmaceutical industries are characterized by intense and rapidly changing competition to develop new technologies and proprietary products. If we commence research and development activities, we would face potential competition from many different sources, including larger and better-funded pharmaceutical and biotechnology companies.

Government Regulation

The FDA and comparable regulatory authorities in state and local jurisdictions and in other countries impose substantial and burdensome requirements upon companies involved in the clinical development, manufacture, marketing and distribution of drugs, such as those we are developing. These agencies and other federal, state and local entities regulate, among other things, the research and development, testing, manufacture, quality control, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion, distribution, post-approval monitoring and reporting, sampling and export and import of our product candidates.

In the United States, the FDA regulates drug products under the Federal Food, Drug and Cosmetic Act, or FFDCA, and the FDA's implementing regulations. Drugs are also subject to other federal, state and local statutes and regulations. If we fail to

comply with applicable FDA or other requirements at any time during the drug development process, clinical testing, the approval process or after approval, we may become subject to administrative or judicial sanctions. These sanctions could include, among other things, the FDA's refusal to approve pending applications, license suspension or revocation, withdrawal of an approval, warning letters, product recalls, clinical holds, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties or criminal prosecution. Any FDA enforcement action could have a material adverse effect on us.

FDA approval is required before any new unapproved drug or dosage form, including a new use of a previously approved drug, can be marketed in the United States. The process required by the FDA before a drug may be marketed in the United States generally involves:

- completion of extensive nonclinical laboratory tests, nonclinical animal studies and formulation studies many of which must be performed in accordance with the FDA's current Good Laboratory Practice, or cGLP, regulations;
- submission to the FDA of an IND application which must become effective before human clinical trials in the United States may begin;
- approval by an independent Institutional Review Board (IRB) at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials to establish the safety and efficacy of the drug candidate for each proposed indication in accordance with the FDA's current Good Clinical Practice (cGCP), regulations;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with current Good Manufacturing Practice (cGMP), regulations;
- submission to the FDA of an NDA;
- satisfactory completion of a potential review by an FDA advisory committee, if applicable; and
- FDA review and approval of the NDA prior to any commercial marketing, sale or shipment of the drug.

The nonclinical and clinical testing and approval process requires substantial time, effort and financial resources, and, if we resume our research and development activities, we cannot be certain that any approvals for our product candidates will be granted on a timely basis, if at all. Nonclinical tests include laboratory evaluation of product chemistry, formulation, stability and toxicity, as well as animal studies to assess the characteristics and potential safety and efficacy of the product. The results of nonclinical tests, together with manufacturing information, analytical data and a proposed clinical trial protocol and other information, are submitted as part of an IND to the FDA. Some nonclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises concerns or questions relating to one or more proposed clinical trials and places the clinical trial on a clinical hold, including concerns that human research subjects will be exposed to unreasonable health risks. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, a submission of an IND may not result in FDA authorization to commence a clinical trial. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development.

Clinical trials involve the administration of the investigational drug to human subjects under the supervision of qualified investigators. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, the parameters to be used in monitoring safety and the effectiveness criteria to be used. Each protocol must be submitted to the FDA as part of the IND. An IRB for each medical center proposing to conduct a clinical trial must also review and approve a plan for any clinical trial before it can begin at that center and the IRB must monitor the clinical trial until it is completed. The FDA, the IRB, or the sponsor may suspend or discontinue a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk. Clinical testing also must satisfy cGCP requirements, including the requirement to obtain effective informed consent from study subjects.

All clinical research performed in the United States in support of an NDA must be authorized in advance by the FDA under the IND regulations and procedures described above. However, a sponsor who wishes to conduct a clinical trial outside the United States may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of an NDA so long as the clinical trial is conducted in compliance with an international guideline for the ethical conduct of clinical research known as the Declaration of Helsinki and/or the laws and regulations of the country or countries in which the clinical trial is performed, whichever provides the greater protection to the participants in the clinical trial.

Clinical Trials

For purposes of NDA submission and approval, clinical trials are typically conducted in three or four sequential phases, which may overlap or be combined.

- *Phase 1:* Clinical trials are initially conducted in a limited population of subjects to test the drug candidate for safety, dose tolerance, absorption, metabolism, distribution and excretion in healthy humans or, on occasion, in patients with severe problems or life-threatening diseases to gain an early indication of its effectiveness.
- *Phase 2:* Clinical trials are generally conducted in a limited patient population to evaluate dosage tolerance and appropriate dosage, identify possible adverse effects and safety risks, and evaluate preliminarily the efficacy of the drug for specific indications in patients with the disease or condition under study.
- *Phase 3:* Clinical trials are typically conducted when Phase 2 clinical trials demonstrate that a dose range of the product candidate is effective and has an acceptable safety profile. Phase 3 clinical trials are commonly referred to as "pivotal" studies, which typically denotes a study that presents the data that the FDA or other relevant regulatory agency will use to determine whether or not to approve a drug. Phase 3 clinical trials are generally undertaken with large numbers of patients, such as groups of several hundred to several thousand, to further evaluate dosage, to provide substantial evidence of clinical efficacy and to further test for safety in an expanded and diverse patient population at multiple, geographically-dispersed clinical trial sites.
- *Phase 4:* In some cases, the FDA may condition approval of an NDA for a product candidate on the sponsor's agreement to conduct additional clinical trials after NDA approval. In other cases, a sponsor may voluntarily conduct additional clinical trials post-approval to gain more information about the drug. Such post approval trials are typically referred to as Phase 4 clinical trials.

The FDA, the IRB or the clinical trial sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether or not a trial may move forward at designated check points based on access to certain data from the study.

Concurrent with clinical trials, companies usually complete additional animal trials and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the drug in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the drug candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the drug candidate does not undergo unacceptable deterioration over its shelf life.

New Drug Applications

The results of nonclinical studies and of the clinical trials, including negative or ambiguous results as well as positive findings, together with other detailed information, including extensive manufacturing information and information on the composition of the drug, are submitted to the FDA in the form of an NDA requesting approval to market the drug for one or more specified indications. The FDA reviews an NDA to determine, among other things, whether a drug is safe and effective for its intended use.

Once an NDA has been accepted for filing, by law the FDA has 180 days to review the application and respond to the applicant. However, the review process is often significantly extended by FDA requests for additional information or clarification. Under the Prescription Drug User Fee Act, the FDA has a goal of responding to NDAs within 10 months of the filing date for standard review, but this timeframe is also often extended. The FDA may refer the application to an advisory committee for review, evaluation and recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an application, the FDA will inspect the facility or the facilities at which the finished drug product, and sometimes the active drug ingredient, is manufactured, and will not approve the drug unless cGMP compliance is satisfactory. The FDA may also inspect the sites at which the clinical trials were conducted to assess their compliance, and will not approve the drug unless compliance with cGCP requirements is satisfactory.

After the FDA evaluates the NDA and conducts its inspections, it may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application is not ready for approval. A Complete Response Letter may require additional clinical data and/or an additional pivotal Phase 3 clinical trial(s), and/or other significant, expensive and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. Even if such data are submitted, the FDA may ultimately decide that the NDA does not satisfy the criteria for approval. Data from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret data. The FDA could also approve the NDA with a Risk Evaluation and Mitigation Strategy (REMS) plan to mitigate risks, which could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries

and other risk minimization tools. The FDA also may conditionally approve the NDA, among other things, requiring changes to proposed labeling, development of adequate controls and specifications, or a commitment to conduct one or more post-market studies or clinical trials. Such post-market testing may include Phase 4 clinical trials and surveillance to further assess and monitor the product's safety and effectiveness after commercialization. Regulatory approval of oncology products often requires that patients in clinical trials be followed for long periods after approval to determine the overall survival benefit of the drug. The FDA has the authority to prevent or limit further marketing of a drug based on the results of these post-marketing programs.

Drugs may be marketed only for the FDA approved indications and in accordance with the provisions of the approved labeling. Further, if there are any modifications to the drug, including changes in indications, labeling, or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA or NDA supplement, which may require us to develop additional data or conduct additional nonclinical studies and clinical trials. Depending on the nature of the change proposed, an NDA supplement must be filed and approved before the change may be implemented. For many proposed post-approval changes to an NDA, the FDA has up to 180 days to review the application. As with new NDAs, the review process is often significantly extended by the FDA requests for additional information or clarification.

The testing and approval processes require substantial time, effort and financial resources, and each may take several years to complete. Nonclinical and clinical data may be interpreted by the FDA in different ways, which could delay, limit or prevent regulatory approval. We may encounter difficulties or unanticipated costs in our efforts to secure necessary governmental approvals, which could delay or preclude us from marketing drugs. The FDA may limit the indications for use or place other conditions on any approvals that could restrict the commercial application of the drugs.

Other Regulatory Requirements

Any drugs manufactured or distributed by us or our collaborators pursuant to FDA approvals would be subject to continuing regulation by the FDA, including recordkeeping requirements and reporting of adverse experiences associated with the drug. Drug manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with ongoing regulatory requirements, including cGMPs, which impose certain procedural and documentation requirements upon us and our third party manufacturers. Failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as warning letters, suspension of manufacturing, seizure of product, injunctive action or possible civil penalties.

The FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. A company can make only those claims relating to safety and efficacy that are approved by the FDA. Failure to comply with these requirements can result in adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available drugs for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use.

Expedited Review and Accelerated Approval Programs

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of NDAs. For example, Fast Track Designation may be granted to a drug intended for treatment of a serious or life-threatening disease or condition that has potential to address unmet medical needs for the disease or condition. The key benefits of fast track designation are potential eligibility for priority review, rolling review (submission of portions of an application before the complete marketing application is submitted), and accelerated approval, if relevant criteria are met. Based on results of clinical studies submitted in an NDA, upon the request of an applicant, the FDA may grant the NDA a priority review designation, which sets the target date for FDA action on the application at six months after the FDA accepts the application for filing. Priority review is granted where there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis, or prevention of a serious condition. If criteria are not met for priority review, the application is subject to the standard FDA review period of 10 months after FDA accepts the application for filing. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

Under the accelerated approval program, the FDA may approve an NDA on the basis of either a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into

account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the drug's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the Food and Drug Administration Safety and Innovation Act, or FDASIA, which was enacted and signed into law in 2012, established the new Breakthrough Therapy designation. A sponsor may seek FDA designation of its product candidate as a breakthrough therapy if the drug is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition, which is generally defined as a disease or condition that affects fewer than 200,000 individuals in the United States. Orphan drug designation must be requested before submitting an NDA. In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA applicant to receive FDA approval for a particular active ingredient to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug for the same orphan indication, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity or if FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. However, the FDA can still approve other drugs that have a different active ingredient for use in treating the same indication or disease. We have not sought or obtained orphan drug designation for any of our product candidates.

Employees

As of March 3, 2017, we had 9 full-time employees, of whom two have medical degrees and one has a Ph.D. degree. These employees are primarily engaged in assisting the Company with the evaluation of strategic alternatives following the closure of the Company's Phase 1 trial of MRX34, as well as finance, human resources and general management functions necessary to operate as a public company. We have no collective bargaining agreements with our employees and we have not experienced any work stoppages. We consider our relations with our employees to be good.

About Us

We were incorporated in late 2007 under the laws of Delaware and were maintained as a wholly-owned subsidiary of our former parent company, Asuragen, Inc., until the end of 2009 when we became an independent entity. We completed the initial public offering of our common stock in October 2015. Our common stock is currently listed on The NASDAQ Global Market under the symbol "MIRN." We are an "emerging growth company" under the Jumpstart Our Business Startups Act of 2012, and therefore we are subject to reduced public company reporting requirements.

Our principal executive offices are located at 1250 S. Capital of Texas Highway, Austin, TX 78746 and our telephone number is (512) 329-2450. Our website address is www.mirnarx.com. The information contained on, or that can be accessed through, our website is not part of this Annual Report on Form 10-K or any other filings we make with the U.S. Securities and Exchange Commission, or the SEC. We have included our website address in this document solely as an inactive textual reference.

Available Information

We make available on or through our website certain reports and amendments to those reports that we file with, or furnish to, the SEC in accordance with the Securities Exchange Act of 1934, as amended, or the Exchange Act. These include our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. We make this information available on or through our website free of charge as soon as reasonably practicable after we electronically file the information with, or furnish it to, the SEC. Copies of this information may be obtained at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room may be obtained by calling the SEC at 1-800-SEC-0330. The SEC maintains a website that contains reports, proxy and information statements, and other information regarding our filings, at www.sec.gov. The information on, or that can be accessed through, our website is not incorporated by reference into this document or any other filings we make with the SEC.

ITEM 1A. RISK FACTORS

Our business involves a high degree of risk. You should consider carefully the following risks, together with all the other information in this periodic report, including our financial statements and notes thereto and "Management's Discussion and Analysis of Financial Condition and Results of Operations." If any of the following risks actually materializes, our operating results, financial condition and liquidity could be materially adversely affected. As a result, the trading price of our common stock could decline. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations.

Risk Factors

Risks Related to Our Evaluation of Strategic Alternatives

Our business to date has been almost entirely dependent on the success of MRX34, and we have decided to discontinue further development of MRX34 and our microRNA product pipeline and devote significant time and resources to identifying and evaluating strategic alternatives, which may not be successful.

To date, we have invested substantially all of our efforts and financial resources in the research and development of MRX34, which was our only product candidate to enter in clinical trials. On September 20, 2016, we voluntarily halted the Phase 1 trial following multiple immune-related SAEs and the IND for MRX34 was placed on full clinical hold. In November 2016, we discontinued research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. There can be no assurance that our process to identify and evaluate potential strategic alternatives will result in any definitive offer to consummate a strategic transaction, or if made what the terms thereof will be or that any transaction will be approved or consummated. If any definitive offer to consummate a strategic transaction is received, there can be no assurance that a definitive agreement will be executed or that, if a definitive agreement is executed, the transaction will be consummated. In addition, there can be no assurance that any transaction, involving our company and/or assets, that is consummated would enhance shareholder value. There can be no assurance that this transaction would enhance shareholder value. There also can be no assurance that we will conduct further drug research or development activities in the future.

Any such strategic transaction may require us to incur non-recurring or other charges, may increase our near-and long-term expenditures and may pose significant integration challenges or disrupt our management or business, which could adversely affect our operations and financial results. For example, these transactions may entail numerous operational and financial risks, including:

- exposure to unknown liabilities;
- incurrence of substantial debt or dilutive issuances of equity securities to pay for acquisitions;
- higher-than-expected acquisition and integration costs;
- write-downs of assets or goodwill or impairment charges;
- increased amortization expenses;
- difficulty and cost in combining the operations and personnel of any acquired businesses with our operations and personnel;
- impairment of relationships with key suppliers or customers of any acquired businesses due to changes in management and ownership; and
- inability to retain key employees of our company or any acquired businesses.

If we do not successfully consummate a strategic transaction, our board of directors may decide to pursue a dissolution and liquidation of our company. In such an event, the amount of cash available for distribution to our stockholders will depend heavily on the timing of such liquidation as well as the amount of cash that will need to be reserved for commitments and contingent liabilities.

There can be no assurance that the process to identify a strategic transaction will result in a successfully consummated transaction. If no transaction is completed, our board of directors may decide to pursue a dissolution and liquidation of our company. In such an event, the amount of cash available for distribution to our stockholders will depend heavily on the timing of such decision and, ultimately, such liquidation, since the amount of cash available for distribution continues to decrease as we fund our

operations while we evaluate our strategic alternatives. In addition, if our board of directors were to approve and recommend, and our stockholders were to approve, a dissolution and liquidation of our company, we would be required under Delaware corporate law to pay our outstanding obligations, as well as to make reasonable provision for contingent and unknown obligations, prior to making any distributions in liquidation to our stockholders. Our commitments and contingent liabilities may include (i) obligations under our employment and related agreements with certain employees that provide for severance and other payments following a termination of employment occurring for various reasons, including a change in control of our company; (ii) potential litigation against us, and other various claims and legal actions arising in the ordinary course of business; and (iii) non-cancelable facility lease obligations. As a result of this requirement, a portion of our assets may need to be reserved pending the resolution of such obligations. In addition, we may be subject to litigation or other claims related to a dissolution and liquidation of our company. If a dissolution and liquidation were pursued, our board of directors, in consultation with its advisors, would need to evaluate these matters and make a determination about a reasonable amount to reserve. Accordingly, holders of our common stock could lose all or a significant portion of their investment in the event of a liquidation, dissolution or winding up of our company.

We are substantially dependent on our remaining employees to facilitate the consummation of a strategic transaction.

Our ability to successfully complete a strategic transaction depends in large part on our ability to retain certain of our remaining personnel, particularly Paul Lammers, M.D., M.Sc., our president and chief executive officer. Despite our efforts to retain these employees, one or more may terminate their employment with us on short notice. The loss of the services of any of these employees could potentially harm our ability to evaluate and pursue strategic alternatives, as well as fulfill our reporting obligations as a public company.

Risks Related to Our Limited Operating History, Financial Position and Capital Requirements

We have incurred significant losses since inception. We anticipate that we will continue to incur significant losses for the foreseeable future, and if we are unable to achieve and sustain profitability, the market value of our common stock will likely decline.

We are a biopharmaceutical company with a limited operating history. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. We have not generated any product revenues and we do not expect to generate any product revenues for the foreseeable future. We have incurred losses in each year since our founding in 2007 and we expect to continue to incur significant operating losses for the foreseeable future. The amount of future losses is uncertain. None of our product candidates has been approved for sale. We have historically devoted substantially all of our efforts to research and development, including our preclinical and nonclinical development activities. In November 2016, we discontinued research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. To date, we have derived all of our funding from our collaboration with our former parent company, Asuragen, Inc., or Asuragen, private and public placements of our capital stock and government grants for research and development. Our net loss for the year ended December 31, 2016 was $26.3 million. Since inception, we have incurred net losses leading to an accumulated deficit of approximately $102.8 million as of December 31, 2016.

We expect to continue to incur significant expenses and operating losses for the foreseeable future as we evaluate strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' equity and working capital. If we are unable to achieve and sustain profitability, the market value of our common stock will likely decline. Because of the numerous risks and uncertainties associated with developing biopharmaceutical products, we are unable to predict the extent of any future losses or whether we will become profitable.

Our short operating history may make it difficult to evaluate the success of our business to date and to assess our future viability.

We are a biopharmaceutical company that was founded in 2007 and did not exist as a standalone company until 2009. Our operations to date have been limited to organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying and evaluating potential product candidates and delivery technologies, undertaking nonclinical studies, filing an IND application with the FDA, and conducting a Phase 1 clinical trial of MRX34. None of our product candidates are in clinical development and, in November 2016, we discontinued our research and development activities relating to our product candidates that were in preclinical development. We have not demonstrated our ability to initiate clinical trials for product candidates other than MRX34, or successfully complete any clinical trials, including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial scale medicine, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Typically, it takes many years to develop one new product candidate from the time it is discovered to when it is available for treating patients. Consequently, any predictions

about our future success or viability, or any evaluation of our business or prospects, may not be as accurate as they could be if we had a longer operating history. In addition, as a new business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown challenges.

Risks Related to Product Development and Commercialization

We face potential product liability, and, if successful claims are brought against us, we may incur substantial liability and costs. If the use or misuse of our product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to our product candidates, we could be subject to costly and damaging product liability claims. If we are unable to obtain adequate insurance or are required to pay for liabilities resulting from a claim excluded from, or beyond the limits of, our insurance coverage, a material liability claim could adversely affect our financial condition.

The use or misuse of our product candidates in clinical trials exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. There is a risk that our product candidates may induce adverse events. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. Certain oligonucleotide therapeutics and liposomal drug delivery products have shown injection site reactions, infusion reactions, and pro-inflammatory effects, and may also lead to organ dysfunction, including impairment of kidney or liver function. There is a risk that our product candidates may induce similar adverse events. Patients with the diseases targeted by our product candidates are often already in severe and advanced stages of disease and have both known and unknown significant pre-existing and potentially life-threatening health risks. During the course of treatment, patients may suffer adverse events, including death, for reasons that may be related to our product candidates. Such events could subject us to costly litigation, require us to pay substantial amounts of money to injured patients, delay, negatively impact or end our opportunity to receive or maintain regulatory approval to market our products, or require us to suspend or abandon our commercialization efforts. Even in a circumstance in which we do not believe that an adverse event is related to our products, the investigation into the circumstance may be time-consuming or inconclusive. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on our business, financial condition or results of operations.

We have product liability insurance that we feel is appropriate for our stage of development, which covers clinical trials in the United States, for up to $1 million per occurrence, up to an aggregate limit of $5 million; however, our insurance may be insufficient to reimburse us for any expenses or losses we may suffer. Our product liability insurance policy for clinical trials completed in the United States expires on December 31, 2017. In addition, we have product liability insurance, which covers clinical trials in the Republic of Korea, for up to KRW 625,000,000 per occurrence, or approximately $500,000, up to an aggregate limit of KRW 2,500,000,000 or approximately $2,000,000. Our product liability insurance policy for clinical trials completed in the Republic of Korea includes one additional year of coverage expiring on October 11, 2017. We do not know whether we will be able to continue to obtain product liability coverage and obtain expanded coverage if we require it, in sufficient amounts to protect us against losses due to liability, on acceptable terms, or at all. We may not have sufficient resources to pay for any liabilities resulting from a claim excluded from, or beyond the limits of, our insurance coverage. Where we have provided indemnities in favor of third parties under our agreements with them, there is also a risk that these third parties could incur liability and bring a claim under such indemnities. An individual may bring a product liability claim against us alleging that one of our product candidates or products causes, or is claimed to have caused, an injury or is found to be unsuitable for consumer use. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability, and a breach of warranties. Claims could also be asserted under state consumer protection acts. Any product liability claim brought against us, with or without merit, could result in:

- initiation of investigations by regulators;
- substantial costs of litigation, including monetary awards to patients or other claimants;
- liabilities that substantially exceed our product liability insurance, which we would then be required to pay ourselves;
- an increase in our product liability insurance rates or the inability to maintain insurance coverage in the future on acceptable terms, if at all;
- the diversion of management's attention from our business; and
- damage to our reputation and the reputation of our products and our technology.

Product liability claims may subject us to the foregoing and other risks, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

Risks Related to Our Reliance on Third Parties

If we attempt to form collaborations in the future with respect to our product candidates, we may not be able to do so.

We may attempt to form strategic alliances, create joint ventures or collaborations or enter into licensing arrangements with third parties with respect to our programs that we believe will complement or augment our existing business. We may face significant competition in seeking appropriate strategic partners, and the negotiation process to secure appropriate terms is time-consuming and complex. We may not be successful in our efforts to establish such a strategic partnership for any product candidates and programs on terms that are acceptable to us, or at all. This may be because our product candidates and programs may be deemed to be at too early of a stage of development for collaborative effort, our research and development pipeline may be viewed as insufficient, the competitive or intellectual property landscape may be viewed as too intense or risky, and/or third parties may not view our product candidates and programs as having sufficient potential for commercialization, including the likelihood of an adequate safety and efficacy profile.

If we entered into a collaboration, we may be unable to realize the potential benefits of any collaboration.

If we enter into a collaboration with respect to the development and/or commercialization of one or more product candidates, there is no guarantee that the collaboration would be successful. Collaborations may pose a number of risks, including:

- collaborators often have significant discretion in determining the efforts and resources that they will apply to the collaboration, and may not commit sufficient resources to the development, marketing or commercialization of the product or products that are subject to the collaboration;
- collaborators may not perform their obligations as expected;
- any such collaboration may require us to relinquish potentially valuable rights to our current product candidates, potential products or proprietary technologies or grant licenses on terms that are not favorable to us;
- collaborators may cease to devote resources to the development or commercialization of our product candidates if the collaborators view our product candidates as competitive with their own products or product candidates;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the course of development, might cause delays or termination of the development or commercialization of product candidates, and might result in legal proceedings, which would be time-consuming, distracting and expensive;
- collaborators may be impacted by changes in their strategic focus or available funding, or business combinations involving them, which could cause them to divert resources away from the collaboration;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- the collaborations may not result in us achieving revenues to justify such transactions; and
- collaborations may be terminated and, if terminated, may result in a need for us to raise additional capital to resume further development or commercialization of the applicable product candidate.

As a result, a collaboration may not result in the successful development or commercialization of our product candidates.

Reliance on government funding for our programs may add uncertainty to our research and commercialization efforts with respect to those programs that are tied to such funding and may impose requirements that limit our ability to take certain actions, increase the costs of commercialization and production of product candidates developed under those programs and subject us to potential financial penalties, which could materially and adversely affect our business, financial condition and results of operations.

During the course of our development of our product candidates, we have been funded in significant part through federal and state grants, including but not limited to the substantial funding we have received from the Texas Emerging Technology Fund and the Cancer Prevention and Research Institute of Texas, or CPRIT. In addition to the funding we have received to date, we have in the past applied for federal and state grants to receive additional funding. Contracts and grants funded by the U.S. government, state governments and their related agencies, including our contracts with the State of Texas pertaining to funds we have already received, include provisions that reflect the government's substantial rights and remedies, many of which are not typically found in commercial contracts, including powers of the government to:

- potentially require repayment of all or a portion of the grant proceeds, in certain cases with interest, in the event we violate certain covenants pertaining to various matters that include any potential relocation outside of the State of Texas, failure to achieve certain milestones or to comply with terms relating to use of grant proceeds, or failure to comply with certain laws;
- terminate agreements, in whole or in part, for any reason or no reason;

- reduce or modify the government's obligations under such agreements without the consent of the other party;
- claim rights, including intellectual property rights, in products and data developed under such agreements;
- audit contract-related costs and fees, including allocated indirect costs;
- suspend the contractor or grantee from receiving new contracts pending resolution of alleged violations of procurement laws or regulations;
- impose U.S. manufacturing requirements for products that embody inventions conceived or first reduced to practice under such agreements;
- impose qualifications for the engagement of manufacturers, suppliers and other contractors as well as other criteria for reimbursements;
- suspend or debar the contractor or grantee from doing future business with the government;
- control and potentially prohibit the export of products;
- pursue criminal or civil remedies under the False Claims Act, False Statements Act and similar remedy provisions specific to government agreements; and
- limit the government's financial liability to amounts appropriated by the U.S. Congress on a fiscal-year basis, thereby leaving some uncertainty about the future availability of funding for a program even after it has been funded for an initial period.

In addition to those powers set forth above, the government funding we may receive could also impose requirements to make payments based upon sales of our products in the future, if any. For example, under the terms of our 2010 award from CPRIT, we are required to pay CPRIT a portion of our revenues from sales of certain products by us, or received from our licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to our right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. In addition, the 2010 grant contract also contains a provision that provides for repayment to CPRIT some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas. See also "Business-Strategic Partnerships and Licenses" for a description of this CPRIT agreement, which includes a description of our obligations to make royalty payments.

We may not have the right to prohibit the U.S. government from using certain technologies developed by us, and we may not be able to prohibit third-party companies, including our competitors, from using those technologies in providing products and services to the U.S. government. The U.S. government generally takes the position that it has the right to royalty-free use of technologies that are developed under U.S. government contracts. These and other provisions of government grants may also apply to intellectual property we license now or in the future.

In addition, government contracts and grants normally contain additional requirements that may increase our costs of doing business, reduce our profits, and expose us to liability for failure to comply with these terms and conditions. These requirements include, for example:

- specialized accounting systems unique to government contracts and grants;
- mandatory financial audits and potential liability for price adjustments or recoupment of government funds after such funds have been spent;
- public disclosures of certain contract and grant information, which may enable competitors to gain insights into our research program; and
- mandatory socioeconomic compliance requirements, including labor standards, non-discrimination and affirmative action programs and environmental compliance requirements.

If we fail to maintain compliance with any such requirements that may apply to us now or in the future, we may be subject to potential liability and to termination of our contracts.

Risks Related to Administrative Operations

Recent changes in our executive leadership and any similar changes in the future may serve as a significant distraction for our management and employees.

Since the beginning of 2016, there have been three changes to our executive leadership team. In May 2016, we transitioned our Chief Medical Officer from Dr. Sinil Kim to Dr. Vincent O'Neill and, in June 2016, we mutually agreed with Dr. Miguel Barbosa that Dr. Barbosa would resign as our Chief Scientific Officer. Effective in December 2016, we terminated the employment of Jon Irvin, our Vice President of Finance, in connection with our restructuring as part of a plan to reduce operating costs. Such changes, or any other future changes in our executive leadership, may disrupt our operations as we adjust to the reallocation of

responsibilities and assimilate new leadership and, potentially, differing perspectives on our strategic direction. If the transition in executive leadership is not smooth, the resulting disruption could negatively affect our ability to execute our strategic plan.

Our internal computer systems, or those of our CROs or other contractors or consultants, may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our CROs (if any) and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our programs. For example, the loss of clinical trial data from completed or ongoing clinical trials for any of our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, including the confidential medical information of clinical trial participants, we could incur liability.

Our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees, independent contractors, principal investigators, CROs, consultants and vendors, if any, may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violates: (i) FDA regulations, including those laws requiring the reporting of true, complete and accurate information to the FDA; (ii) manufacturing standards; (iii) federal and state healthcare fraud and abuse laws and regulations; or (iv) laws that require the true, complete and accurate information or data. Specifically, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Activities subject to these laws also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter misconduct by our employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Requirements associated with being a public company have increased and will continue to increase our costs significantly, as well as divert significant company resources and management attention.

Prior to our initial public offering in 2015, we were not subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or the other rules and regulations of the Securities and Exchange Commission, or SEC, or any securities exchange relating to public companies. We are working with our legal, independent accounting and financial advisors to identify those areas in which changes should be made to our financial and management control systems to manage our growth and our obligations as a public company. These areas include corporate governance, corporate control, disclosure controls and procedures and financial reporting and accounting systems. We have made, and will continue to make, changes in these and other areas. However, the expenses associated with operating as a public company are material, particularly after we cease to be an "emerging growth company." Compliance with the various reporting and other requirements applicable to public companies also requires considerable time and attention of management. In addition, the changes we have made, and continue to make, may not be sufficient to allow us to satisfy our obligations as a public company on a timely basis, or at all.

However, for as long as we remain an "emerging growth company" as defined in the Jumpstart our Business Startups Act, or the JOBS Act, we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies," including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. Because the JOBS Act has only recently been enacted, it is not yet clear whether investors will accept the more limited disclosure requirements that we may be entitled to follow while we are an "emerging growth company." If they do not, we may elect to comply with

disclosure requirements as if we were not an "emerging growth company," in which case we would incur the greater expenses associated with such disclosure requirements.

We will remain an "emerging growth company" for up to five years after the completion of our initial public offering, although if the market value of our common stock that is held by non-affiliates exceeds $700 million as of any June 30 before that time or if we have total annual gross revenues of $1 billion or more during any fiscal year before that time, we would cease to be an "emerging growth company" as of the end of that fiscal year, or if we issue more than $1 billion in non-convertible debt in a three-year period, we would cease to be an "emerging growth company" immediately.

In addition, being a public company could make it more difficult or costly for us to obtain certain types of insurance, including directors' and officers' liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

If we are not able to implement the requirements of Section 404 of the Sarbanes-Oxley Act of 2002 in a timely manner or with adequate compliance, we may be subject to sanctions by regulatory authorities.

Section 404 of the Sarbanes-Oxley Act of 2002 requires that we evaluate and determine the effectiveness of our internal controls over financial reporting and, beginning with our annual report for fiscal year 2016, provide a management report on the internal control over financial reporting. If we have a material weakness in our internal control over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We will be evaluating our internal controls systems to allow management to report on, and eventually allow our independent auditors to attest to, our internal controls. We will be performing the system and process evaluation and testing (and any necessary remediation) required to comply with the management certification and eventual auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002. The aforementioned auditor attestation requirements will not apply to us until we are no longer considered an "emerging growth company."

We cannot be certain as to the timing of completion of our evaluation, testing and remediation actions or the impact of the same on our operations. If we are not able to implement the requirements of Section 404 in a timely manner or with adequate compliance, we may be subject to sanctions or investigation by regulatory authorities, such as the SEC or The NASDAQ Stock Market LLC, or NASDAQ. Any such action could adversely affect our financial results or investors' confidence in us and could cause our stock price to fall. Moreover, if we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal controls that are deemed to be material weaknesses, we could be subject to sanctions or investigations by the SEC, NASDAQ or other regulatory authorities, which would entail expenditure of additional financial and management resources and could materially adversely affect our stock price. Deficient internal controls could also cause us to fail to meet our reporting obligations or cause investors to lose confidence in our reported financial information, which could have a negative effect on our stock price.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses during our history and were not profitable in 2016 and may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. We may be unable to use these losses to offset income before such unused losses expire. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, if a corporation undergoes an "ownership change," generally defined as a greater than 50 percentage point change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss, or NOL, carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be further limited. We believe that we have experienced at least one ownership change in the past. We may also experience additional ownership changes as a result of subsequent shifts in our stock ownership. Accordingly, our ability to use our pre-change NOL carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. For these reasons, we may not be able to utilize any or a material portion of our NOL carryforwards and other tax attributes.

We, or the third parties upon whom we depend, may be adversely affected by natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Natural disasters could severely disrupt our operations, and have a material adverse effect on our business, financial condition and results of operations. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as our enterprise financial systems or manufacturing resource planning and enterprise quality systems, or that otherwise disrupted operations, it may be difficult or, in

certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which could have a material adverse effect on our business.

Furthermore, if we resume our research and development activities and integral parties in our supply chain are geographically concentrated and operating from single sites, this would increasing their vulnerability to natural disasters or other sudden, unforeseen and severe adverse events. If such an event were to affect such parties in our supply chain, it could have a material adverse effect on our business.

Risks Related to Intellectual Property

If we are sued for infringing the patent rights or misappropriating the trade secrets of third parties, such litigation could be costly and time consuming.

It is also possible that we have failed to identify relevant third-party patents or applications. For example, applications filed before November 29, 2000 and certain applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Moreover, it is difficult for industry participants, including us, to identify all third-party patent rights that may be relevant to our product candidates and technologies because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. We may fail to identify relevant patents or patent applications or may identify pending patent applications of potential interest but incorrectly predict the likelihood that such patent applications may issue with claims of relevance to our technology. In addition, we may be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of a current or future product candidate, or we may incorrectly conclude that a third-party patent is invalid, unenforceable or not infringed by our activities. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our technologies, our products or the use of our products.

There is a substantial amount of intellectual property litigation in the biotechnology and pharmaceutical industries, and we may become party to, or threatened with, litigation or other adversarial proceedings regarding patent rights with respect to our technology or products candidates, including interferences, oppositions and *inter partes* review proceedings before the USPTO and corresponding foreign patent offices. We also monitor patent prosecution activities and pending applications of competitors and potential competitors in our field in order to identify third party patent rights that could pose a potential threat to our freedom to operate in the market with respect to our product candidates, once commercialized. We are currently pursuing and may in the future pursue available administrative proceedings in the U.S. or foreign patent offices to challenge third party patent rights that could adversely impact our ability to commercialize one or more of our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our current or future product candidates may be subject to claims of infringement of the patent rights of third parties, who may assert infringement claims against us based on existing or future patent rights. Third parties may assert that we are employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates and third parties could allege that our technology infringes such claims. Further, because patent applications can take many years to issue, third parties may have currently pending patent applications which may later result in issued patents that our product candidates may infringe, or which such third parties claim are infringed by the use of our technologies. The outcome of patent litigation is subject to uncertainties that cannot be adequately quantified in advance. The pharmaceutical and biotechnology industries have produced a significant number of patents, and it may not always be clear to industry participants, including us, which patents cover various types of products or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If we are sued for patent infringement, we would need to demonstrate that our product candidates, products or methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid, and we may not be able to do this. Proving that a patent is invalid is difficult. For example, in the United States, proving invalidity requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on us. In addition, we may not have sufficient resources to bring these actions to a successful conclusion.

If we are found to infringe a third party's patent rights, we could be forced, including by court order, to cease developing, manufacturing or commercializing the infringing product candidate or product. Alternatively, we may be required to obtain a license from such third party in order to use the infringing technology and continue developing, manufacturing or marketing the infringing product candidate. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same

technologies licensed to us. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

Parties making claims against us for infringement of their patent rights may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we could be required to redesign our infringing products or obtain a license from such third party to continue developing and commercializing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms, or at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. It may be impossible to redesign our products and technology, or it may require substantial time and monetary expenditure, which could force us to cease commercialization of one or more of our product candidates or some of our business operations, which could materially harm our business. In addition, in any such proceeding, we may be required to pay substantial damages, including treble damages and attorneys' fees in the event we are found liable for willful infringement.

If we breach any of the agreements under which we license patent rights to use, develop and commercialize our product candidates or our technologies from third parties or, in certain cases, we fail to meet certain development deadlines, we could lose license rights that are important to our business.

We are a party to a number of license agreements under which we are granted rights to intellectual property that are important to our business and we expect that we may need to enter into additional license agreements in the future, if we resume our research and development activities which have been discontinued. These include our exclusive cross-license agreement with Asuragen, our exclusive licenses from Yale University, or Yale, Marina, the University of Zurich, and Rosetta Genomics Ltd., or Rosetta Genomics.

Our existing license agreements, except our cross-license agreement with Asuragen, generally impose, and we expect that future license agreements (if any) would impose on us, various development, regulatory and/or commercial diligence obligations, and financial obligations, such as payment of milestones and/or royalties. If we fail to comply with our obligations under these agreements, or we are subject to a bankruptcy, the licensor may have the right to terminate the license, in which event we may not be able to market products covered by the license. Our business could suffer, for example, if any current or future licenses terminate, if the licensors fail to abide by the terms of the license, if the licensed patents or other rights are found to be invalid or unenforceable, or if we are unable to enter into necessary licenses on acceptable terms. See "Business-Strategic Partnerships and Licenses" for a description of our license agreements, which sets forth the material terms and obligations, including a description of the termination provisions, under our agreements with Asuragen, Yale, Marina, the University of Zurich and Rosetta Genomics.

As we have done previously, if we commence research and development of product candidates, we may need to obtain licenses from third parties to advance research or allow commercialization of product candidates, and we cannot provide any assurances that third-party patents do not exist that might be enforced against our current product candidates or future products in the absence of such a license. We may fail to obtain any of these licenses on commercially reasonable terms, if at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology, if we resume our research and development activities. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates, which could materially harm our business and the third parties owning such intellectual property rights could seek either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues. Disputes may arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;

- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates, and what activities satisfy those diligence obligations; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed arise, we would expect to exercise all rights and remedies available to us, including seeking to cure any breach by us, and otherwise seek to preserve our rights under the patents licensed to us. However, we may not be able to do so in a timely manner, at an acceptable cost or at all. Generally, the loss of any one of our current licenses, or any other license we may acquire in the future, could prevent or impair our ability to successfully develop and commercialize the affected product candidates and thus materially harm our business, prospects, financial condition and results of operations.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We were previously involved in discussions with Yale regarding the inventorship and ownership of certain patents and patent applications licensed to us by Asuragen. An independent third party expert was engaged to determine the inventorship and the ownership of patents and patent applications potentially subject to Yale and Asuragen co-ownership. This determination confirmed Asuragen's sole ownership of the patents and patent applications where co-ownership had been under consideration and resulted in a determination that Yale should be removed as a co-owner of one of the pending patent applications, an action we are currently undertaking.

Although we seek to protect our ownership of our patents and other intellectual property by ensuring that our agreements with our employees and certain collaborators and other third parties with whom we do business include provisions requiring, for instance, such parties to assign rights in inventions to us, we may be subject to claims that former or current employees, collaborators or other third parties have an ownership interest in our patents, in-licensed patents or other intellectual property. In some situations, our confidentiality agreements may conflict with, or be subject to, the rights of third parties with whom our employees, consultants or advisors have previous employment or consulting relationships, and further, many of our consultants are currently retained by other biotechnology or pharmaceutical companies, including our competitors or potential competitors, and may be subject to conflicting obligations to these third parties. To the extent that our employees, consultants or contractors use any intellectual property owned by third parties in their work for us, disputes may arise as to the ownership of rights in any related or resulting know-how and inventions, arising, for example, from such conflicting obligations of consultants, employees or others who are involved in developing our product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Obtaining and maintaining patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent prosecution process. Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or patent applications will be due to be paid to the USPTO and various patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we employ reputable law firms and other professionals and rely on such third parties to effect payment of these fees with respect to the USPTO and non-U.S. patent agencies with respect to the patents and patent applications we own, and we rely upon our licensors to effect payment of these fees with respect to the patents and patent applications that we in-license. Even if we do not control prosecution and maintenance of our in-licensed patents, we may be responsible for reimbursing our licensors for some or all of the costs associated with such activities. If we fail to make timely payment to our licensors for such fees, our licensors may have the right to terminate the affected license, in which event we would not be able to market products covered by the license. We also employ reputable law firms and other professionals to help us comply with the various documentary and other procedural requirements with respect to the patents and patent applications that we own. In some cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market and this circumstance would have a material adverse effect on our business.

We may be subject to claims that our employees or consultants or independent contractors have wrongfully used or disclosed confidential information or trade secrets of third parties or that our employees or consultants have wrongfully used or disclosed alleged trade secrets of former or other employers.

Many of our employees, independent contractors and consultants, including our senior management, have been previously employed or retained by other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and independent contractors do not use the proprietary information or know-how of third parties in their work for us, and do not perform work for us that is in conflict with their obligations to another employer or any other entity, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise improperly used or disclosed confidential information, including trade secrets or other proprietary information, of a former employer or other third parties. We may also be subject to claims that an employee, advisor, consultant, or independent contractor performed work for us that conflicts with that person's obligations to a third party, such as an employer, and thus, that the third party has an ownership interest in the intellectual property arising out of work performed for us. We are not aware of any threatened or pending claims related to these matters, but in the future litigation may be necessary to defend against such claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable personnel or intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property disputes could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and/or management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the market price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

Risks Related to Our Common Stock

Our stock price is volatile and our stockholders may not be able to resell shares of our common stock at or above the price they paid.

The trading price of our common stock is highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include those discussed in this "Risk Factors" section of this report and others such as:

- announcement of a strategic transaction, including the acquisition of our company or its assets;
- announcements relating to collaborations that we may enter into with respect to the development or commercialization of our product candidates;
- announcements relating to the receipt, modification or termination of government contracts or grants;
- success of our competitors in discovering, developing or commercializing products;
- product liability claims related to our clinical trials or product candidates;
- prevailing economic conditions;
- additions or departures of key personnel;
- business disruptions caused by earthquakes or other natural disasters;
- disputes concerning our intellectual property or other proprietary rights;
- FDA or other U.S. or foreign regulatory actions affecting us or our industry;
- sales of our common stock by us, our executive officers and directors or stockholders in the future;
- future sales or issuances of equity or debt securities by us;
- lack of an active, liquid and orderly market in our common stock;
- fluctuations in our quarterly operating results; and
- the issuance of new or changed securities analysts' reports or recommendations regarding us.

In addition, the stock markets in general, and the markets for pharmaceutical, biopharmaceutical and biotechnology stocks in particular, have experienced extreme volatility that have been often unrelated to the operating performance of the issuer. These broad market fluctuations may adversely affect the trading price or liquidity of our common stock. In the past, when the market price of a stock has been volatile, holders of that stock have sometimes instituted securities class action litigation against the issuer. If any of our stockholders were to bring such a lawsuit against us, we could incur substantial costs defending the lawsuit and the attention of our management would be diverted from the operation of our business.

Our common stock may be delisted from the NASDAQ Global Market if we are unable to maintain compliance with NASDAQ's continued listing standards.

NASDAQ imposes, among other requirements, continued listing standards including minimum bid and public float requirements. The price of our common stock must trade at or above $1.00 to comply with NASDAQ's minimum bid requirement for continued listing on the NASDAQ. If our stock trades at bid prices of less than $1.00 for a period in excess of 30 consecutive business days, the NASDAQ could send a deficiency notice to us for not remaining in compliance with the minimum bid listing standards. During the third quarter of fiscal year 2016, our common stock never traded below $1.00. However, if the closing bid price of our common stock fails to meet NASDAQ's minimum closing bid price requirement, or if we otherwise fail to meet any other applicable requirements of the NASDAQ and we are unable to regain compliance, NASDAQ may make a determination to delist our common stock.

Any delisting of our common stock could adversely affect the market liquidity of our common stock and the market price of our common stock could decrease. Furthermore, if our common stock were delisted it could adversely affect our ability to obtain financing for the continuation of our operations and/or result in the loss of confidence by investors, customers, suppliers and employees.

Our principal stockholders and management own a significant percentage of our stock and are able to exert significant control over matters subject to stockholder approval.

Based on the beneficial ownership of our common stock as of December 31, 2016, our officers and directors, together with holders of 5% or more of our outstanding common stock and their respective affiliates, beneficially own approximately 68.0% of our common stock. Accordingly, these stockholders have significant influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, any merger, consolidation or sale of all or substantially all of our assets or any other significant corporate transaction. The interests of these stockholders may not be the same as or may even conflict with your interests. For example, these stockholders could delay or prevent a change of control of our company, even if such a change of control would benefit our other stockholders, which could deprive our stockholders of an opportunity to receive a premium for their common stock as part of a sale of our company or our assets and might affect the prevailing market price of our common stock. The significant concentration of stock ownership may adversely affect the trading price of our common stock due to investors' perception that conflicts of interest may exist or arise.

We are an "emerging growth company" and we cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act, and may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, Section 102 of the JOBS Act also provides that an "emerging growth company" can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act of 1933, as amended, or the Securities Act, for complying with new or revised accounting standards. An "emerging growth company" can therefore delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. However, we are choosing to "opt out" of such extended transition period, and as a result, we will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies. Section 107 of the JOBS Act provides that our decision to opt out of the extended transition period for complying with new or revised accounting standards is irrevocable.

Future sales of our common stock or securities convertible or exchangeable for our common stock may depress our stock price.

If our existing stockholders or holders of our options sell, or indicate an intention to sell, substantial amounts of our common stock in the public market, the trading price of our common stock could decline. The perception in the market that these sales may occur could also cause the trading price of our common stock to decline. As of December 31, 2016, we have a total of 20,841,393 shares of common stock outstanding

In addition, based on the number of shares subject to outstanding awards under our 2008 Long Term Incentive Plan, or 2008 Stock Plan, as of December 31, 2016, and including the initial reserves under our 2015 Equity Incentive Award Plan, or 2015 Plan, and Employee Stock Purchase Plan, or ESPP, approximately 3.9 million shares of common stock that are either subject to outstanding options, outstanding but subject to vesting, or reserved for future issuance under the 2008 Stock Plan, 2015 Plan or ESPP will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules. We also filed a registration statement permitting certain shares of common stock issued in the future pursuant to the 2008 Plan, 2015 Plan and ESPP to be freely resold by plan participants in the public market, subject to the applicable vesting schedules and, for shares held by directors, executive officers and other affiliates, volume limitations under Rule 144 under the Securities Act. The 2015 Plan and ESPP also contain provisions for the annual increase of the number of shares reserved for issuance under such plans, which shares we also intend to register. If the shares we may issue from time to time under the 2008 Stock Plan, 2015 Plan or ESPP are sold, or if it is perceived that they will be sold, by the award recipient in the public market, the trading price of our common stock could decline.

Certain holders of approximately 13.6 million shares of our common stock at December 31, 2016 are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates. Sales of such shares could also cause the trading price of our common stock to decline.

An active, liquid and orderly market for shares of our common stock may not be sustained.

Prior to our initial public offering in October 2015, there had been no public market for our common stock, and an active public market for our shares may not be sustained. Further, certain of our existing institutional investors, including investors affiliated with certain of our directors, purchased approximately 2.4 million shares of common stock in our initial public offering and consequently fewer shares may be actively traded in the public market because these stockholders are restricted from selling the shares by restrictions under applicable securities laws, which would reduce the liquidity of the market for our common stock. If an active market for shares of our common stock is not maintained it may be difficult for our stockholders' to sell their shares at the time they wish to sell them or at a price that they consider reasonable or it may result in volatility in our stock price. An inactive market may also impair our ability to raise capital by selling shares and may impair our ability to acquire other businesses or technologies or in-license new product candidates using our shares as consideration.

Our quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

We expect our operating results to be subject to quarterly fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- variations in the level of our operating expenses;
- receipt, modification or termination of government contracts or grants, and the timing of payments we receive under these arrangements;
- our execution of any collaborative, licensing or similar arrangements, and the timing of payments we may make under these arrangements; and
- any intellectual property infringement lawsuit or opposition, interference or cancellation proceeding in which we may become involved.

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may, in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

Provisions of our charter documents or Delaware law could delay or prevent an acquisition of our company, even if the acquisition would be beneficial to our stockholders, and could make it more difficult for you to change management.

Provisions in our amended and restated certificate of incorporation and our amended and restated bylaws may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable, including transactions in which stockholders might otherwise receive a premium for their shares. In addition, these provisions may frustrate or prevent any attempt by our stockholders to replace or remove our current management by making it more difficult to replace or remove our board of directors. These provisions include:

- a classified board of directors so that not all directors are elected at one time;
- a prohibition on stockholder action through written consent;
- no cumulative voting in the election of directors;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director;
- a requirement that special meetings of stockholders be called only by the board of directors, the chairman of the board of directors, the chief executive officer or, in the absence of a chief executive officer, the president;
- an advance notice requirement for stockholder proposals and nominations;
- the authority of our board of directors to issue preferred stock with such terms as our board of directors may determine; and
- a requirement of approval of not less than 66 2/3% of all outstanding shares of our capital stock entitled to vote to amend any bylaws by stockholder action, or to amend specific provisions of our certificate of incorporation.

In addition, Delaware law prohibits a publicly held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person who, together with its affiliates, owns or within the last three years has owned 15% or more of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. Accordingly, Delaware law may discourage, delay or prevent a change in control of our company. Furthermore, our amended and restated certificate of incorporation will specify that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving actions brought against us by stockholders. We believe this provision benefits us by providing increased consistency in the application of Delaware law by chancellors particularly experienced in resolving corporate disputes, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in such action.

Provisions in our charter and other provisions of Delaware law could limit the price that investors are willing to pay in the future for shares of our common stock.

Our employment agreements with our officers may require us to pay severance benefits to any of those persons who are terminated in connection with a change of control of us, which could harm our business, financial condition or results of operations.

Our officers are parties to employment agreements providing for aggregate cash payments of up to approximately $2.5 million at December 31, 2016 for severance and other benefits in the event of a termination of employment in connection with a change of control of us. The payment of these severance benefits could harm our business, financial condition and results of operations. In addition, these potential severance payments may discourage or prevent third parties from seeking a business combination with us.

We do not anticipate paying any cash dividends on our common stock in the foreseeable future; therefore, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

We have never declared or paid cash dividends on our common stock. We do not anticipate paying any cash dividends on our common stock in the foreseeable future. We currently intend to retain all available funds and any future earnings to fund our operations. In addition, the terms of any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

If securities or industry analysts do not publish research, or publish inaccurate or unfavorable research, about our business, our stock price and trading volume could decline.

The trading market for our common stock will depend, in part, on the research and reports that securities or industry analysts publish about us or our business. Securities and industry analysts do not currently, and may never, publish research on our company. If no securities or industry analysts commence coverage of our company, the trading price for our common stock would likely be negatively impacted. In the event securities or industry analysts initiate coverage, if one or more of the analysts who cover us downgrade our common stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline. In addition, if our operating results fail to meet the forecast of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, demand for our common stock could decrease, which might cause our stock price and trading volume to decline.

Changes in, or interpretations of, accounting rules and regulations could result in unfavorable accounting charges or require us to change our compensation policies.

Accounting methods and policies for biopharmaceutical companies, including policies governing revenue recognition, research and development and related expenses and accounting for stock-based compensation, are subject to further review, interpretation and guidance from relevant accounting authorities, including the SEC. Changes to, or interpretations of, accounting methods or policies may require us to reclassify, restate or otherwise change or revise our financial statements, including those contained in this periodic report.

ITEM 1B. ***UNRESOLVED STAFF COMMENTS***

None.

ITEM 2. ***PROPERTIES***

Our corporate headquarters are located in Austin, Texas and consist of approximately 924 square feet of office space for which we have a lease that expires on May 31, 2017. In addition, in June 2016, we entered into a lease agreement for approximately 23,578 square feet of office and laboratory space, and we have not occupied this space as we are evaluating our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. The initial term of such lease expires in January 2027 and may be extended by us for up to two consecutive 60-month terms. We believe that our existing facilities are sufficient for our needs for the foreseeable future.

ITEM 3. ***LEGAL PROCEEDINGS***

From time to time, we are subject to various legal proceedings, claims and administrative proceedings that arise in the ordinary course of our business activities. Although the results of litigation and claims cannot be predicted with certainty, as of the date of this report, we do not believe we are party to any claim, proceeding or litigation the outcome of which, if determined adversely to us, would individually or in the aggregate be reasonably expected to have a material adverse effect on our business. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

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*

Price Range of Common Stock

Our common stock has been publicly traded on The NASDAQ Stock Market LLC, or NASDAQ, under the symbol "MIRN" since the initial public offering, or IPO, of our common stock on October 1, 2015. Prior to that time, there was no public market for our common stock. The following table sets forth on a per share basis, for the periods indicated, the low and high sale prices of our common stock as reported by NASDAQ.

	High	Low
Year Ended December 31, 2016		
First quarter	$ 6.65	$ 3.57
Second quarter	$ 4.94	$ 3.96
Third quarter	$ 4.45	$ 1.82
Fourth quarter	$ 1.98	$ 1.12
Year Ended December 31, 2015		
Fourth quarter (beginning October 1)	$ 11.01	$ 5.54

Holders of Record

At March 1, 2017, there were approximately 144 stockholders of record of our common stock, and the closing price per share of our common stock was $2.29. Since many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

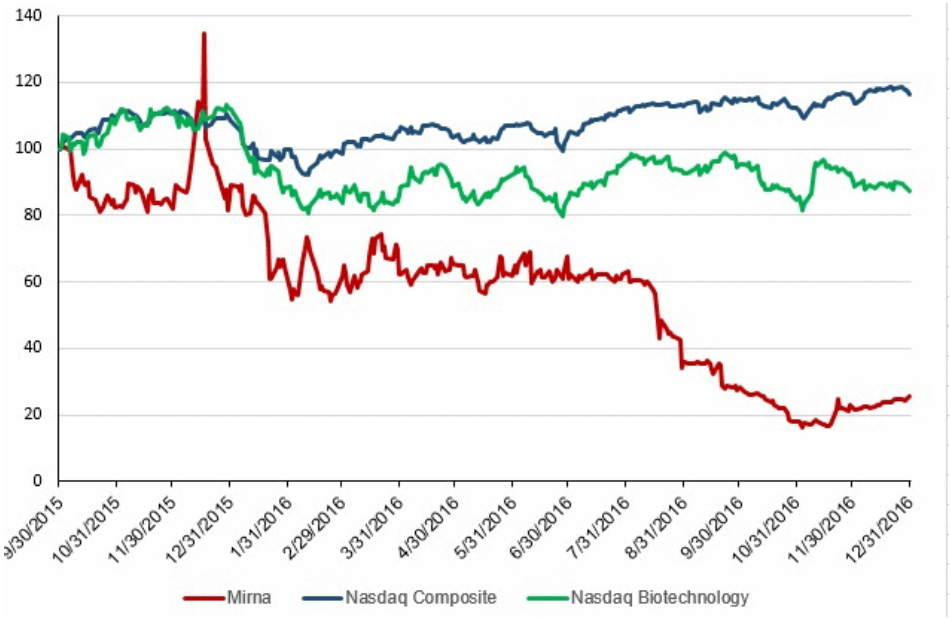
Dividends

We have never declared or paid cash dividends on our capital stock. However, we issued shares of common stock to the holders of Series C convertible preferred stock and Series D convertible preferred stock as part of our IPO under the terms of our then-effective certificate of incorporation as a result of an accruing paid-in-kind dividend.

We intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to dividend policy will be made at the discretion of our board of directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements, contractual restrictions, business prospects and other factors our board of directors may deem relevant.

Stock Performance Graph

The following graph illustrates a comparison of the total cumulative stockholder return on our common stock since September 30, 2015, which is the date our common stock first began trading on NASDAQ, to two indices: the NASDAQ Composite Index and the NASDAQ Biotechnology Index. The graph assumes an initial investment of $100 on September 30, 2015. The stockholder return shown in the graph below is not necessarily indicative of future performance, and we do not make or endorse any predictions as to future stockholder returns. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.



Recent Sales of Unregistered Securities

From January 1, 2016 through December 31, 2016, we have not issued any securities in a transaction not registered under the Securities Act that have not been previously disclosed in a Quarterly Report on Form 10-Q or Current Report on Form 8-K.

Use of Proceeds

On September 30, 2015, the U.S. Securities and Exchange Commission declared effective our registration statement on Form S-1 (File No. 333-206544), as amended, filed in connection with our initial public offering. Pursuant to the registration statement, we registered the offer and sale of 6,250,000 shares of our common stock with an aggregate offering price of approximately $43.8 million, as well as the issuance of an additional 704,962 shares of our common stock pursuant to the underwriters' partial exercise of their option to purchase additional shares, for an aggregate offering price of approximately $4.9 million. In total, we issued and sold an aggregate of 6,954,962 shares of our common stock at a price to the public of $7.00 per share for an aggregate offering price of approximately $48.7 million. The managing underwriters of the offering were Citigroup, Leerink Partners, Oppenheimer & Co. and Cantor Fitzgerald & Co. After deducting underwriting discounts and commissions and offering expenses paid or payable by us of $5.0 million, the aggregate net proceeds from the offering were $43.7 million. No offering expenses were paid or are payable, directly or indirectly, to our directors or officers, to persons owning 10% or more of any class of our equity securities or to any of our affiliates.

The net proceeds from our initial public offering have been invested in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities. Following the close of the Company's Phase 1 clinical trial of MRX34, the Company is evaluating strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company, and has discontinued further research and development activities to reduce operating expenses while it evaluates these opportunities. We currently expect to use the remaining net proceeds from our initial public offering primarily for working capital and other general corporate purposes, which include our activities to evaluate and pursue strategic alternatives.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

ITEM 6. ***SELECTED FINANCIAL DATA***

The following selected statement of operations data for the years ended December 31, 2014, 2015 and 2016, and the selected balance sheet data at December 31, 2014, 2015 and 2016 have been derived from our audited financial statements included elsewhere in this Annual Report on Form 10-K. Our historical results for any prior period are not necessarily indicative of results to be expected in any future period.

The information set forth below should be read in conjunction with the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report on Form 10-K and with our financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K.

	Year Ended December 31,			
	2016	2015	2014	2013
	(in thousands, except share and per share data)			
Statement of Operations Data:				
Operating expenses:				
Research and development	$ 13,930	$ 18,947	$ 10,545	$ 4,391
General and administrative	8,118	6,080	3,369	2,384
Restructuring expense	4,442	—	—	—
Loss on disposal of assets	128	—	—	—
Write-off of offering expenses	—	—	1,920	—
Total operating expenses	26,618	25,027	15,834	6,775
Other income (expense):				
Interest income (expense)	350	44	—	—
Change in fair value of option liability	—	—	—	339
Net loss	$ (26,268)	$ (24,983)	$ (15,834)	$ (6,436)
Less: Accretion and dividends on convertible preferred stock	—	(4,320)	(2,824)	(2,324)
Net loss attributable to common stockholders	$ (26,268)	$ (29,303)	$ (18,658)	$ (8,760)
Net loss per share attributable to common stockholders, basic and diluted	$ (1.26)	$ (5.85)	$ (291.00)	$ 4,408.65
Common shares used to compute basic and diluted net loss per share attributable to common stockholders	5,010,323	5,010,323	64,131	1,987

	At December 31,			
	2016	2015	2014	2013
	(in thousands)			
Balance Sheet Data:				
Cash and cash equivalents	$ 16,432	$ 89,713	$ 9,319	$ 23,182
Short-term marketable securities	44,066	—	—	—
Total assets	64,166	90,917	9,825	23,684
Total liabilities	3,814	5,901	2,499	1,145
Convertible preferred stock	—	—	55,277	52,453
Common stock	21	21	—	—
Additional paid-in capital	163,126	161,518	—	890
Accumulated deficit	(102,791)	(76,523)	(47,951)	(30,804)
Other comprehensive income	(4)	—	—	—
Total stockholders' (deficit) equity	64,166	85,016	(47,951)	(29,914)

ITEM 7. *MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS*

You should read the following management's discussion and analysis of our financial condition and results together with the section entitled "Selected Financial Data" and our financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This discussion and other parts of this Annual Report contain forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations and intentions. Our actual results could differ materially from those discussed in these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the "Risk Factors" section in Part I Item IA.

Overview

We are a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics, which are short ribonucleic acid, or RNA, molecules, or oligonucleotides.

Our first product candidate, MRX34, was studied as a single agent in a Phase 1 clinical trial. In September 2016, we voluntarily halted the Phase 1 trial following multiple immune-related serious adverse events, or SAEs, observed in patients dosed with MRX34 in the trial. Subsequently, we received notification from the U.S. Food and Drug Administration, or the FDA, that the Investigational New Drug Application, or IND, for MRX34 was on full clinical hold. Following our suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, we discontinued development of MRX34 and our microRNA product pipeline.

In November 2016, we discontinued research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. We also initiated a plan in November 2016 to reduce personnel and expenses to preserve capital and further streamline our operations consistent with our decision to discontinue development of MRX34 and our microRNA product pipeline. We expect to devote significant time and resources to identifying and evaluating strategic alternatives, however, there can be no assurance that such activities will result in any agreements or transactions that will enhance shareholder value. Further, any strategic transaction that is completed ultimately may not deliver the anticipated benefits or enhance shareholder value.

We were incorporated in 2007 under the laws of Delaware and were maintained as a wholly-owned subsidiary of our former parent company, Asuragen, Inc., or Asuragen, until the end of 2009, when we became an independent entity.

Our operations have historically focused on developing our understanding of and capabilities in microRNA biology, identifying potential product candidates, undertaking preclinical studies, initiating and conducting a clinical trial, protecting and enhancing our intellectual property estate and providing general and administrative support for these activities. We have not generated any revenue from product sales and, to date, have funded our operations primarily through the private placement of convertible preferred stock, federal and state government grants, offerings of our common stock, and support from our former parent company, Asuragen. From our inception through December 31, 2016, we have raised an aggregate of approximately $167.3 million to fund our operations, of which approximately $89.9 million was from the issuance of preferred stock for cash and assets, $48.7 million from a public offering of our common stock, $16.8 million from a private placement of our common stock and $11.9 million was from federal and state grants.

Since our inception, we have incurred significant operating losses. Our net loss was $26.3 million for the year ended December 31, 2016. At December 31, 2016, we had an accumulated deficit of $102.8 million. We expect to continue to incur significant expenses and operating losses. Our net losses may fluctuate significantly from quarter to quarter and from year to year. We anticipate that our expenses will decrease as we proceed with our reduction in force; discontinue our research and development activities; and focus on evaluating our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company.

Financial Operations Overview

Revenue

We have not generated any revenue from product sales or from collaborations. In the future, we may generate revenue following a potential strategic transaction, which may result in a clinical asset. Revenue may fluctuate from period to period, and the timing and extent of any future revenue will depend on our ability to consummate a strategic transaction.

Research and Development Expenses

Research and development expenses have consisted primarily of costs incurred for our research activities, including our historical drug discovery efforts, and the development of our product candidates, which included the following:

- employee-related expenses, including salaries, benefits, travel and stock-based compensation;
- external research and development expenses incurred under arrangements with third parties, such as contract research organizations, or CROs, consultants and our scientific advisory board;
- lab supplies, and acquiring, developing and manufacturing preclinical study materials in accordance with Good Laboratory Practices;
- costs of clinical trials, including costs for management, investigator fees and related vendors that provide services for the clinical trials;
- costs to manufacture the drug used in the clinical trials in accordance with Good Manufacturing Practices;
- license and milestone fees;
- development and prosecution of intellectual property; and
- costs of facilities, depreciation and other expenses.

In September 2016, Mirna announced its decision to close the Phase 1 study of MRX34 and voluntarily halted the enrollment and dosing of patients in the study. Further, in November 2016, the Company discontinued research and development activities to reduce operating expenses.

Research and development costs have been expensed as incurred. In certain circumstances, we have made nonrefundable advance payments to purchase goods and services for future use pursuant to contractual arrangements. In those instances, we deferred and recognized an expense in the period that we receive or consume the goods or services.

Our research and development expenses have been offset by proceeds derived from federal and state grants. These government grants, which have supplemented our research efforts on specific projects, generally provided for reimbursement of approved costs, as defined in the terms of the grant awards. The proceeds from these reimbursement grants are treated as a reduction to the associated expenses as the allowable expenses are incurred.

Prior to discontinuing our research and development activities, at any point in time, we typically had various early stage research and drug discovery projects ongoing. Our internal resources, employees and infrastructure were not directly tied to any one research or drug discovery project and were typically deployed across multiple projects. As such, we did not maintain information regarding the costs incurred for these early stage research and drug discovery programs on a basis. However, we historically spent the vast majority of our research and development resources on our first product candidate, MRX34, which has been placed on full clinical hold by the FDA.

We anticipate that our research and development expenses will decrease as we initiate our reduction in force; discontinue our research and development activities; focus on evaluating our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company; and the complete closure of the Phase 1 clinical trial for MRX34.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related benefits, including stock-based compensation, related to our executive, finance and support functions. Other general and administrative expenses include allocated facility-related costs not otherwise included in research and development expenses, travel expenses and professional fees for auditing, tax and legal services. We expect that general and administrative expenses related to our operations will decrease as a result of the workforce reduction and discontinuance of our research and development activities. These decreases may be offset in whole or in part following the change in our corporate strategy to focus on pursuing potential strategic initiatives to enhance stockholder value.

Recent Accounting Pronouncements

For recent accounting pronouncements see Note 2. *Summary of Significant Accounting Policies* of Notes to the Financial Statements in Part II, Item 8 of this Report.

Critical Accounting Policies and Estimates

This management's discussion and analysis of financial condition and results of operations is based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States, or GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the revenue and expenses incurred during the reported periods. On an ongoing basis, we evaluate our estimates and judgments, including those related to stock-based compensation, clinical trial and pre-clinical study accruals, and restructuring expenses. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not apparent from other sources. Changes in estimates are reflected in reported results for the period in which they become known. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in the Notes to our financial statements appearing elsewhere in this Annual Report on Form 10-K, we believe that the following critical accounting policies are most important to understanding and evaluating our reported financial results.

Stock-Based Compensation

We account for our stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation,* or "ASC 718". ASC 718 requires all stock-based payments to employees, including grants of employee stock options, to be recognized in the statements of operations based on their grant date fair values. For stock options granted to employees and to members of our board of directors for their services on the board of directors, we estimate the grant date fair value of each option award using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires our management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, we recognize stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period.

Clinical Trial and Pre-Clinical Study Accruals

Prior to discontinuing our research and development activities, we estimated pre-clinical study and clinical trial expenses pursuant to contracts with research institutions and contract research organizations that conduct and manage pre-clinical studies and clinical trials on our behalf. These estimates were based on the level of service performed and the underlying agreement. Further, we accrued expenses related to clinical trials based on the level of patient enrollment and other activities according to the related agreements. At such time, we monitored patient enrollment levels and other activities to the extent reasonably possible and adjusted estimates accordingly. If actual costs incurred or the timing of services varied from our estimate, we adjusted the accrual accordingly. On September 20, 2016 we announced our decision to close the ongoing Phase 1 study of MRX34 and halted enrollment and dosing of patients in the study.

Restructuring

Following the closing of the Phase 1 MRX34 clinical trial, we implemented a workforce reduction in the fourth quarter of 2016 to reduce operating expenses while we evaluate strategic alternatives. The majority of severance and benefits payments were settled during the first quarter of 2017. We entered into retention agreements with key employees if these employees remained with us until June 30, 2017 or were terminated by the Company without cause prior to such date. We have recognized the restructuring liability for such retention agreements over our employees' service period.

In accordance with ASC 420, *Exit and Disposal Cost Obligations*, we have also recognized contract termination costs in connection with a leased property we intended to occupy as our corporate headquarters and research facility, as well as a temporary lab in use prior to the suspension of the Company's research and development activities. In addition, we have recognized asset impairments related to our lab equipment used in the Phase 1 clinical trial, construction in process, and other property and equipment for which we do not expect to receive a future benefit.

Amounts recorded in restructuring charges can result from a complex series of judgments about future events and uncertainties and can heavily rely on estimates and assumptions.

Results of Operations

Comparison of years ended December 31, 2016 and 2015:

	Year Ended December 31,		Dollar	
	2016	2015	Change	% Change
	(in thousands)			
Statement of operations data:				
Operating expenses:				
Research and development, before grant reimbursement	$ 13,986	$ 19,405	$ (5,419)	(27.9)%
Less grant reimbursement	(56)	(458)	402	(87.8)%
Research and development	13,930	18,947	(5,017)	(26.5)%
General and administrative	8,118	6,080	2,038	33.5 %
Restructuring expenses	4,442	—	4,442	100.0 %
Loss on Assets	128	—	128	100.0 %
Interest income	(350)	(44)	(306)	100.0 %
Net loss	$ 26,268	$ 24,983	$ 1,285	5.1 %

Research and Development Expenses

Research and development expenses were $13.9 million for the year ended December 31, 2016, which was a decrease of $5.0 million, or 27%, compared to research and development expenses of approximately $18.9 million for the year ended December 31, 2015. The decrease in the year ended December 31, 2016 was primarily due to the following:

- A decrease of approximately $6.5 million in general research and development expenses following our decision to close the Phase 1 study of MRX34 in September 2016 and voluntarily halt the enrollment and dosing of patients in the study and subsequently discontinued further research and development activities. In addition, we incurred certain one-time costs associated with the development and manufacturing of MRX34 during the year ended December 31, 2015, our only product candidate that was in clinical trials through September 2016.
- An offsetting increase of approximately $1.3 million in employee compensation and benefits due to increased headcount compared to the prior period.

Research and development spending was partially offset by approximately $56,000 of grant reimbursements for the year ended December 31, 2016, compared to reimbursement of approximately $458,000 for the year ended December 31, 2015. The decrease is primarily due to two grants which expired in August 2015 and a third grant expiring in August 2016.

General and Administrative Expenses

General and administrative expenses were approximately $8.1 million for the year ended December 31, 2016, which was an increase of approximately $2.0 million, or 34%, compared to the year ended December 31, 2015. The increase for the year ended December 31, 2015 was primarily due to the following:

- Approximately $1.0 million for additional costs associated with operating as a publicly-traded company, including higher legal, audit, insurance, professional fees and administrative costs.
- Approximately $1.0 million of increased employee compensation, benefits and stock compensation expense due to increased headcount and changes in compensation, of which $455,000 related to increased payroll and benefits expenses and $545,000 related to stock-based compensation expense

Restructuring Charges

Restructuring charges were approximately $4.4 million for the year ended December 31, 2016. We did not have restructuring charges during the year ended December 31, 2015. On September 20, 2016, we announced our decision to close the Phase 1 clinical trial of MRX34, voluntarily halted the enrollment and dosing of patients in the study and subsequently discontinued our research and development activities. Following the announcement, we received notice from the FDA that our Investigational New Drug MRX 34 had been placed on full clinical hold. Following our announcement and notification from the FDA, our Board of Directors approved a reduction of the total number of our full-time employees from 36 to 12. We also committed to retention payments to certain key employees if such employees remained with us until June 30, 2017 or were terminated by us without cause prior to such date. The restructuring expenses recognized during the year ended December 31, 2016 included approximately $1.5 million for employee severance and benefits, $1.5 million for lease facility termination costs, and $1.4 million for non-cash impairment charges of property and equipment. The majority of employee severance and related benefits are expected to be settled in the first quarter of 2017. We expect to incur additional restructuring charges of approximately $0.3 million through the six months ended June 30, 2017.

Comparison of year ended December 31, 2015 and 2014:

	Year Ended December 31,		Dollar	
	2015	2014	Change	% Change
	(in thousands)			
Statement of operations data:				
Operating expenses:				
Research and development, before grant reimbursement	$ 19,405	$ 10,626	$ 8,779	82.6 %
Less grant reimbursement	(458)	(81)	(377)	465.4 %
Research and development	18,947	10,545	8,402	79.7 %
General and administrative	6,080	3,369	2,711	80.5 %
Write off of offering expenses	—	1,920	(1,920)	(100.0)%
Interest income	(44)	—	(44)	100.0 %
Net loss	$ 24,983	$ 15,834	$ 9,149	57.8 %

Research and Development Expenses

Research and development spending, prior to the offset of grant reimbursements, was $19.4 million for the year ended December 31, 2015, which was an increase of approximately $8.8 million, or 83%, compared to research and development spending, prior to the offset of grant reimbursements, of $10.6 million for the year ended December 31, 2014. After giving effect to the offset of grant reimbursements, research and development expenses were $18.9 million for the year ended December 31, 2015, which was an increase of $8.4 million, or 80%, compared to research and development expenses of approximately $10.5 million for the year ended December 31, 2014. The increase in the year ended December 31, 2015 was primarily due to increased clinical trial costs related to our Phase 1 clinical trial, including a higher number of patients, additional investigator sites related to the increased trial activity; increased personnel costs due to increases in headcount, and increased intellectual property and licensing costs.

Research and development spending was partially offset by approximately $458,000 of grant reimbursements for the year ended December 31, 2015, compared to reimbursement of approximately $81,000 for the same period in 2014. The increase was due to a higher volume of work being performed on the research funded by the federal grants.

General and Administrative Expenses

General and administrative expenses were approximately $6.1 million for the year ended December 31, 2015, which was an increase of approximately $2.7 million, or 81%, compared to the same period in 2014. General and administrative expenses increased primarily due to increased personnel-related expenses, higher outside professional costs, consulting costs and recruiting costs.

Write-off of Offering Expenses

We deferred costs incurred for a planned initial public offering, or IPO, through August 2014, which included legal, audit, tax and other professional fees. The IPO was delayed and, as a result, we recorded a write-off of deferred offering costs of $1.9 million during the year ended December 31, 2014. Deferred offering costs incurred through December 31, 2015 have been recorded as a reduction of proceeds from a concurrent private placement and the IPO.

Liquidity and Capital Resources

Liquidity and Capital Expenditures

Since inception, we have raised $167.3 million to fund our operations, of which approximately $89.9 million was from the issuance of preferred stock for cash and assets, $48.7 million was from a public offering of our common stock, $16.8 million was from a private placement of our common stock and $11.9 million was from federal and state grants. At December 31, 2016, we had $16.4 million of cash and cash equivalents and $44.1 invested in marketable securities for a total of $60.5 million in liquid assets. Our primary uses of cash are to fund operating expenses and evaluate strategic alternatives. Cash used to fund operating expenses is impacted by the timing of when we pay these expenses, as reflected in the change in our outstanding accounts payable and accrued expenses.

We believe that our existing cash, cash equivalents and marketable securities as of December 31, 2016, will be sufficient to meet our anticipated cash requirements for at least the next 12 months. However, our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially.

Our future capital requirements are difficult to forecast and will depend on many factors, including:

- our ability to identify and consummate a strategic transaction for the Company;
- the timing and nature of any strategic transactions that we undertake;
- whether we enter into a partnership or business combination;
- our ability to establish and maintain collaboration partnerships, in-license/out-license or other similar arrangements and the financial terms of such agreements; and
- the cost incurred in responding to disruptive actions by activist stakeholders.

In addition, certain executive officers are entitled to certain payments if they are terminated without cause or as a result of a change in control. Upon termination without cause, and not as a result of death or disability, each of such officers is entitled to receive payment of base salary for 9 to 12 months following termination of employment and certain officers will be entitled to continue to receive coverage under medical and dental benefit plans for 9 to 12 months or until such officers are covered under a separate plan from another employer. Upon a termination other than for cause or with good reason following a change in control, each of such officers is entitled to receive payment of base salary for 12 to 18 months following termination of employment and 100% to 150% of the executive's target bonus pain in a single cash lump sum. In addition, the officers will be entitled to continue to receive coverage under medical and dental benefit plans for 12 to 18 months or until such officers are covered under a separate plan from another employer.

The following table shows a summary of our cash flows for the year ended December 31, 2016 and 2015:

	Year Ended December 31,		
	2016	2015	2014
	(in thousands)		
Net cash provided by (used in):			
Operating activities	$ (24,805)	$ (21,135)	$ (13,970)
Investing activities	(48,491)	(251)	(102)
Financing activities	16	101,780	209
Net increase (decrease)	$ (73,280)	$ 80,394	$ (13,863)

Operating Activities

Net cash used in operating activities was $24.8 million and $21.1 million for the year ended December 31, 2016 and 2015, respectively. The increase in overall spending for operating activities of approximately $3.7 million was due to increased headcount and personnel expenses, increased compliance costs related to operating as a public company for a full year, payment of licensing fees accrued at December 31, 2015, and severance and benefits payments in connection with the workforce reduction initiated by us in November 2016. The increase was partially offset by a decrease in research and development expenditures following our decision to close the ongoing Phase 1 study of MRX34 in September 2016 and voluntarily halt the enrollment and dosing of patients in the study, as well as discontinuing further research and development activities.

Net cash used in operating activities was $21.1 million and $14.0 million for the years ended December 31, 2015 and 2014, respectively. The increase in overall spending for operating activities of approximately $7.1 million was due to increased headcount and personnel expenses, increased spending for clinical trials and intellectual property related expenses and higher license fees for 2015. The increase was partially offset by the one-time write-off of IPO offering-related costs in August 2014.

Investing Activities

Net cash used in investing activities for the periods presented relates primarily to the purchase of marketable securities during the year ended December 31, 2016. We invested $103.1 million in US treasury, US government agency and corporate debt securities with maturities greater than 90 days using surplus proceeds received in connection with our IPO and concurrent private placement in October 2015, partially offset by maturities of debt securities during the period of $58.8 million. In addition, the Company obtained a standby letter of credit of $2.4 million in connection with the lease entered into in June 2016 reflected in fiscal year 2016 investing activities as restricted cash.

For the year ended December 31, 2016, 2015, and 2014, total amounts spent on the purchase of fixed assets were approximately $1,729,000, $313,000, and $102,000 respectively.

Financing Activities

Net cash provided by financing activities was $16,000 for the year ended December 31, 2016, which was due to the exercise of stock options.

Net cash provided by financing activities was approximately $101.8 million for the year ended December 31, 2015, which was due to the offering of our Series D convertible preferred stock, as well as our IPO and concurrent private placement.

For the year ended December 31, 2014 net cash provided by financing activities of $16.4 million was due to the net proceeds from the second funding round of our Series C convertible preferred stock in December 2013.

Contractual Obligations and Commitments

The following table presents payments due under the Company's contractual obligations as of December 31, 2016:

		Payments Due by Period			
	Total	Less than 1 Year	1-3 Years	3-5 Years	Over 5 Years
Operating lease	6,917,376	450,929	1,248,219	1,324,311	3,893,916
Other	73,736	73,736			
Total	6,991,112	524,665	1,248,219	1,324,311	3,893,916

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the Securities and Exchange Commission.

Segment Information

We have one primary business activity and operate as one reportable segment.

ITEM 7A. ***QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK***

The market risk inherent in our financial instruments and in our financial position represents the potential loss arising from adverse changes in interest rates. At December 31, 2016, we had cash and cash equivalents of $16.4 million, consisting of cash, interest-bearing money market accounts and U.S. treasury and agency securities with maturities of less than 90 days when purchased. At December 31, 2016, we had short-term marketable securities of $44.1 million, consisting of U.S. treasury and agency securities and investment-grade corporate debt securities with maturities greater than 90 days but less than 180 days when purchased. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. Due to the short-term maturities of our cash equivalents and the low risk profile of our investments, we do not believe a change in interest rates would have a material effect on the fair market value of our cash, cash equivalents and short-term marketable securities.

ITEM 8. ***FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA***

The following financial statements, and the related notes thereto, of Mirna Therapeutics, Inc. and the Reports of the Company's Independent Registered Public Accounting Firm are filed as a part of this Report.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of
Mirna Therapeutics, Inc.

We have audited the accompanying balance sheets of Mirna Therapeutics, Inc. (the "Company") as of December 31, 2016 and 2015, and the related statements of operations, stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2016. 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. We were not engaged to perform an audit of the Company's 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 and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Mirna Therapeutics, Inc. at December 31, 2016 and 2015, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2016 in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Austin, Texas
March 14, 2017

MIRNA THERAPEUTICS, INC.

Balance Sheets

(in thousands, except share and per share data)

	December 31, 2016	December 31, 2015
Assets		
Current Assets:		
Cash and cash equivalents	$ 16,432	$ 89,713
Short-term marketable securities	44,066	—
Prepaid expenses and other current assets	882	829
Total current assets	61,380	90,542
Property and equipment, net	354	375
Restricted cash	2,432	—
Total assets	$ 64,166	$ 90,917
Liabilities and Stockholders' Equity (Deficit)		
Current Liabilities:		
Accounts payable	$ 361	$ 3,687
Accrued expenses	2,400	2,214
Total current liabilities	2,761	5,901
Lease obligations, long-term	1,053	—
Total liabilities	$ 3,814	$ 5,901
Stockholders' Equity (Deficit):		
Preferred stock, $0.001 par value, 5,000,000 authorized at December 31, 2016 and 2015; 0 shares outstanding at December 31, 2016 and 2015	—	—
Common stock, $0.001 par value; 250,000,000 shares authorized at December 31, 2016 and 2015; 20,841,393 shares issued and outstanding at December 31, 2016; 20,830,555 shares issued and outstanding at December 31, 2015	21	21
Additional paid in capital	163,126	161,518
Accumulated deficit	(102,791)	(76,523)
Other comprehensive loss	(4)	—
Total stockholders' equity	60,352	85,016
Total liabilities and stockholders' equity	$ 64,166	$ 90,917

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Operations and Comprehensive Loss

(in thousands, except share and per share data)

	Year Ended December 31,		
	2016	2015	2014
Operating expenses:			
Research and development	$ 13,930	$ 18,947	$ 10,545
General and administrative	8,118	6,080	3,369
Restructuring charges	4,442	—	—
Loss on disposal of assets	128	—	—
Write-off of offering costs	—	—	1,920
Total operating expenses	26,618	25,027	15,834
Other income:			
Interest income	350	44	—
Net loss	$ (26,268)	$ (24,983)	$ (15,834)
Less: Accretion and dividends on convertible preferred stock	—	(4,320)	(2,824)
Net loss attributable to common stockholders	$ (26,268)	$ (29,303)	$ (18,658)
Other Comprehensive Loss:			
Unrealized loss on available-for-sale securities, net of tax	$ (4)	$ —	$ —
Total other comprehensive loss	$ (26,272)	$ (29,303)	$ (18,658)
Net loss per share attributable to common stockholders—basic and diluted	$ (1.26)	$ (5.85)	$ (291.00)
Common shares used to compute basic and diluted net loss per share attributable to common stockholders	20,833,963	5,010,323	64,131

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Stockholders' Equity (Deficit)

(in thousands, except share amounts)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Other Comprehensive Income	Total Stockholders Equity (Deficit)
	Shares	Amount				
Balance at January 1, 2014	2,061	$ —	$ 890	$ (30,804)	—	$ (29,914)
Exercise of stock options	80,816	—	209	—	—	209
Issuance of common stock	448	—	4	—	—	4
Stock-based compensation	—	—	408	—	—	408
Series C dividends	—	—	(1,511)	(1,313)	—	(2,824)
Net loss	—	—	—	(15,834)	—	(15,834)
Balance at December 31, 2014	83,325	—	—	(47,951)	—	(47,951)
Exercise of stock options	28,516	1	66	—	—	67
Stock-based compensation	—	—	985	—	—	985
Accretion of convertible preferred stock	—	—	(180)	(269)	—	(449)
Series C & Series D dividends	—	—	(551)	(3,320)	—	(3,871)
Conversion of preferred stock	11,368,742	11	100,927	—	—	100,938
Initial public offerings of common stock, net of offering costs of $5,021	6,954,962	7	43,657	—	—	43,664
Issuance of common stock in private placement concurrently with initial public offering, net of offering costs of $149	2,395,010	2	16,614	—	—	16,616
Net loss	—	—	—	(24,983)	—	(24,983)
Balance at December 31, 2015	20,830,555	21	161,518	(76,523)	—	85,016
Exercise of stock options	5,313	—	9	—	—	9
Issuance of stock under Employee Stock Purchase Plan	5,525	—	7	—	—	7
Stock-based compensation	—	—	1,592	—	—	1,592
Other comprehensive loss	—	—	—	—	(4)	(4)
Net loss	—	—	—	(26,268)	—	(26,268)
Balance at December 31, 2016	20,841,393	$ 21	$ 163,126	$ (102,791)	(4)	60,352

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Cash Flows

(in thousands)

	Year Ended December 31,		
	2016	**2015**	**2014**
Operating activities			
Net loss	$ (26,268)	$ (24,983)	$ (15,834)
Adjustment to reconcile net loss to net cash used in operating activities:			
Restructuring charges	4,442	—	—
Depreciation and amortization	159	54	35
Stock-based compensation	1,592	985	408
Issuance of stock for services	—	—	4
Amortization of premiums/ discounts on marketable securities	260	—	—
Loss on disposal of assets	128	—	—
Changes in operating assets and liabilities:			
Grant reimbursement and other receivables	(160)	119	40
Prepaid expenses and other current assets	107	(650)	(99)
Deferred offering costs	—	—	105
Other noncurrent assets	—	—	17
Accounts payable	(3,264)	2,816	189
Accrued expenses	(1,801)	524	1,165
Net cash used in operating activities	(24,805)	(21,135)	(13,970)
Investing activities			
Purchases of marketable securities	(103,114)	—	—
Maturities of marketable securities	58,784	—	—
Restricted cash	(2,432)	—	—
Purchase of property and equipment	(1,729)	(251)	(102)
Net cash used in investing activities	(48,491)	(251)	(102)
Financing activities			
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	41,433	—
Proceeds from the issuance of common stock, net of issuance costs	—	60,280	—
Proceeds from the exercise of stock options	16	67	209
Cash provided by financing activities	16	101,780	209
Net increase (decrease) in cash and cash equivalents	(73,280)	80,394	(13,863)
Cash and cash equivalents at beginning of period	89,713	9,319	23,182
Cash and cash equivalents at end of period	$ 16,432	$ 89,713	$ 9,319
Supplemental disclosure of non-cash investing and financing activities			
Conversion of preferred stock to common stock	$ —	$ 100,938	$ —

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Notes to Financial Statements

1. Organization

Nature of business

Mirna Therapeutics, Inc. ("Mirna" or "the Company") is a biopharmaceutical company focused on microRNA-based oncology therapeutics. The Company was incorporated in Delaware in December 2007 as a wholly-owned subsidiary of Asuragen, Inc. ("Asuragen") and was spun out to existing Asuragen stockholders in December 2009. Following the close of the Company's Phase 1 clinical trial of MRX34 in September 2016, the Company is evaluating its strategic alternatives focusing on enhancing stockholder value, including the possibility of a merger or sale of the Company, and has discontinued further research and development activities (see Note 13) to reduce operating expenses while it evaluates these opportunities. The Company is located in Austin, Texas.

In October 2015, the Company sold 6,250,000 shares of common stock, $0.001 par value per share, in an underwritten public offering (the "IPO") and 2,395,010 shares of common stock in a concurrent private placement, with both offerings at a price of $7.00 per share. The underwriters of the IPO purchased an additional 704,962 shares of common stock pursuant to their option to purchase additional shares. The Company's aggregate net proceeds from the IPO were $43.7 million, after deducting the transaction offering costs and the underwriting discounts incurred. The Company also received net proceeds of $16.7 million after deducting the offering transaction costs from the concurrent private placement.

The Company continues to be subject to a number of risks common to companies in similar stages of development. Principal among these risks are uncertainties of technological innovations, dependence on key individuals, development of the same or similar technological innovations by the Company's competitors and protection of proprietary technology. The Company believes that its cash, cash equivalents and marketable securities of $60.5 million at December 31, 2016 will enable the Company to maintain its current and planned operations for at least the next twelve months.

2. Summary of Significant Accounting Policies

Use of estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires the Company's management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Prior to the IPO on October 6, 2015, the Company utilized significant estimates and assumptions in determining the fair value of its common stock. The board of directors determined the estimated fair value of the Company's common stock based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry sector and the prices at which the Company sold shares of convertible preferred stock, the superior rights and preferences of securities senior to its common stock at the time and the likelihood of achieving a liquidity event, such as an initial public offering or sale of the Company.

Prior to its IPO, the Company utilized various valuation methodologies in accordance with the framework of the American Institute of Certified Public Accountants, or AICPA, Audit and Accounting Practice Aid Series: *Valuation of Privately Held Company Equity Securities Issued as Compensation*, or the AICPA Practice Aid, to estimate the fair value of its common stock. The methodologies included the Option Pricing Method utilizing the Backsolve Method (a form of the market approach defined in the AICPA Practice Aid) and the Probability-Weighted Expected Return Method based upon the probability of occurrence of certain future liquidity events such as an initial public offering or sale of the Company. Each valuation methodology includes estimates and assumptions that require the Company's judgment. Significant changes to the key assumptions used in the valuations could result in different fair values of common stock at each valuation date.

Research and development costs

Research and development costs consist of costs the Company incurred for its own research and development activities and for preclinical studies and clinical trials. Research and development costs include salaries and personnel-related costs, consulting fees, fees paid for contract research services, the costs of laboratory equipment and facilities, license fees and other external costs. These research and development costs are expensed when incurred.

The Company records upfront and milestone payments made to third parties under licensing arrangements as an expense. Upfront payments are recorded when incurred and milestone payments are recorded when the specific milestone has been achieved.

The Company accounts for government grants as a reduction of research and development expenses. Government grants are recorded at the time the related research and development costs have been incurred by the Company and, accordingly, become eligible for reimbursement. The Company accrues for government grants that have been earned but not yet received.

Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

Stock-based compensation

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, including grants of employee stock options, to be recognized in the statements of operations based on their grant date fair values. For stock options granted to employees and to members of the board of directors for their services on the board of directors, the Company estimates the grant date fair value of each option award using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, the Company recognizes stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period.

Clinical trial and pre-clinical study accruals

Prior to the discontinuation of the Company's research and development activities, the Company estimated pre-clinical study and clinical trial expenses pursuant to contracts with research institutions and contract research organizations that conducted and managed pre-clinical studies and clinical trials on the Company's behalf. These estimates were based on the level of service performed and the underlying agreement. Further, the Company accrued expenses related to clinical trials based on the level of patient enrollment and other activities according to the related agreements. The Company monitored patient enrollment levels and other activities to the extent reasonably possible and adjusted estimates accordingly. If actual costs incurred or the timing of services varied from the Company's estimate, the Company adjusted the accrual accordingly. On September 20, 2016 the Company announced its decision to close the ongoing Phase 1 study of MRX34 and halted enrollment and dosing of patients in the study.

Restructuring

Following the closing of the Phase 1 MRX34 clinical trial, the Company implemented a workforce reduction in the fourth quarter of 2016 to reduce operating expenses while it evaluates strategic alternatives. The majority of severance and benefits payments were settled during the first quarter of 2017. The Company entered retention agreements with key employees necessary to close the Phase 1 clinical trial of MRX34 if employees remained with the Company until June 30, 2017 or were terminated by the Company without cause prior to such date. The Company has recognized the restructuring liability for such retention agreements over the employees' service period.

In accordance with ASC 420, *Exit and Disposal Cost Obligations,* the Company has also recognized contract termination costs in connection with a leased property it intended to occupy as its corporate headquarters and research facility, as well as a temporary lab in use prior to the discontinuation of the Company's research and development activities. In addition, the Company has recognized asset impairments related to its lab equipment used in the Phase 1 clinical trial, construction in process, and other property and equipment for which the Company does not expect to receive a future benefit.

Amounts recorded in restructuring charges can result from a complex series of judgments about future events and uncertainties and can heavily rely on estimates and assumptions.

Income taxes

Income taxes are recorded in accordance with ASC 740, *Accounting for Income Taxes* ("ASC 740"), which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. The Company determines its deferred tax assets and liabilities based on differences between financial reporting and tax bases of assets and liabilities, which are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. Valuation allowances are provided if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2016 and 2015, the Company does not have any significant uncertain tax positions.

Comprehensive loss

Comprehensive loss is composed of net loss and other comprehensive income or loss. Other comprehensive loss consists of unrealized gains and losses on marketable securities.

Cash and cash equivalents

The Company considers highly liquid investments with a maturity of three months or less when purchased to be cash equivalents. Cash equivalents, which consist primarily of cash, money market funds and U.S. treasury and agency securities with a maturity of less than 90 days when purchased, are stated at fair value.

Concentrations of credit risk

Financial instruments that potentially subject the Company to credit risk consist primarily of cash and cash equivalents and short-term marketable securities. The Company holds these investments in U.S. treasury and agency securities and highly-rated corporate debt securities, and limits the amounts of credit exposure to any one financial institution. These amounts at times may exceed federally insured limits. The Company has not experienced any credit losses in such accounts and does not believe it is exposed to any significant credit risk on these funds. The Company has no off-balance sheet concentrations of credit risk, such as foreign currency exchange contracts, option contracts or other hedging arrangements.

At December 31, 2016, available-for-sale securities are invested in U.S. treasury and agency securities and highly-rated corporate debt securities that had a maturity date of three months or greater when acquired. As discussed in Note 3, the fair value of these securities was $44.1 million, or $4,000 less than their original par value purchase price.

Fair value measurements

The Company records money market funds at fair value. ASC Topic 820, *Fair Value Measurements and Disclosures*, establishes a fair value hierarchy for those instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). The hierarchy consists of three levels:

- Level 1—Unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2—Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability.
- Level 3—Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date.

The carrying amounts reflected in the balance sheets for cash, prepaid expenses and other current assets, accounts payable, and accrued expenses approximate their fair values at December 31, 2016 and 2015, due to their short-term nature.

There have been no changes to the valuation methods during the years ended December 31, 2016 and 2015. The Company evaluates transfers between levels at the end of each reporting period. There were no transfers of assets or liabilities between Level 1, Level 2 or Level 3 during the years ended December 31, 2016 or 2015.

Marketable securities

Marketable securities with maturities at purchase beyond one year, but less than twenty-four months, may be classified as short-term marketable securities based on their highly liquid nature and because such marketable securities represent the investment of cash that is available for current operations. Marketable securities with maturities at purchase beyond twenty-four months are classified as non-current. Available-for-sale securities are maintained by an investment manager and may consist of U.S. Treasury securities and government agency securities and corporate debt securities. Available-for-sale securities are carried at fair value with the unrealized gains and losses included in other comprehensive loss as a component of stockholders' equity until realized. Any premium or discount arising at purchase is amortized and/or accreted to interest income and/or expense over the life of the instrument. Realized gains and losses are determined using the specific identification method and are included in other income.

If any adjustment to fair value reflects a decline in value of the investment, the Company considers all available evidence to evaluate the extent to which the decline is "other-than-temporary" and, if so, mark the investment to market through a charge to the Company's statement of operations and comprehensive loss.

Restricted cash

Restricted cash consists of cash amounts held for specific or limited purposes and, therefore, not available for general operating activities. In June 2016, the Company secured a standby letter of credit of $2.4 million for the benefit of the landlord for the Company's lease of approximately 23,578 square feet of office and laboratory space in the event of default. The restricted cash consists of cash providing security under the terms of the lease described in Note 13.

Property and equipment

Property and equipment consist of laboratory equipment, computer equipment and software, leasehold improvements, furniture and fixtures and office equipment. Property and equipment are stated at cost and depreciated using the straight-line method over the estimated useful lives of the respective assets:

● Laboratory equipment	5-7 years
● Computer equipment and software	3 years
● Leasehold improvements	shorter of asset's useful life or remaining term of lease
● Furniture and fixtures	5 years
● Office equipment	5 years

Costs of major additions and betterments are capitalized; maintenance and repairs, which do not improve or extend the life of the respective assets, are charged to expense as incurred. Upon retirement or sale, the cost of the disposed asset and the related accumulated depreciation are removed from the accounts and the resulting gain or loss is recognized.

Impairment of long-lived assets

The Company periodically evaluates its long-lived assets for potential impairment in accordance with ASC Topic 360, *Property, Plant and Equipment*. Potential impairment is assessed when there is evidence that events or changes in circumstances indicate that the carrying amount of an asset may not be recovered. Recoverability of these assets is assessed based on undiscounted expected future cash flows from the assets, considering a number of factors, including past operating results, budgets and economic projections, market trends and product development cycles. If impairments are identified, assets are written down to their estimated fair value. The Company recognized an impairment charge of $1.4 million for the year ended December 31, 2016.

Offering costs

Deferred offering costs, which consist of direct incremental legal and professional accounting fees relating to preferred stock private placements and initial public offerings, are capitalized. The deferred offering costs are offset against the proceeds from the offering upon the consummation of the offering. In 2014, the Company's initial public offering was delayed and the deferred offering costs for that offering in the amount of $1,920,000 were expensed.

Segment and geographic information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer. The Company and the chief operating decision maker view the Company's operations and manage its business as one operating segment. The Company operates in only one geographic segment.

Net loss per share attributable to common stockholders

Prior to the IPO, the Company used the two-class method to compute net loss per common share attributable to common stockholders because the Company has issued securities, other than common stock, that contractually entitle the holders to participate in dividends and earnings of the Company. The two-class method requires earnings for the period to be allocated between common stock and participating securities based upon their respective rights to receive distributed and undistributed earnings. Historically, holders of the Company's Series A, Series B, Series B-1, Series C and Series D convertible preferred stock were entitled, on a *pari passu* basis, to receive dividends when, as and if declared by the board of directors, prior and in preference to any declaration or payment of any dividend on the common stock until such time as the total dividends paid on each share of Series C and Series D convertible preferred stock is equal to its cumulative dividends. The Series A, Series B and Series B-1 convertible preferred stock would also be entitled to the dividend amount paid to common stockholders on an as-if-converted-to-common stock basis. As a result, all series of the Company's convertible preferred stock were considered participating securities. All of the Company's outstanding preferred stock was converted to common stock in connection with the IPO in October 2015.

Under the two-class method, for periods with net income, basic net income per common share is computed by dividing the net income attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Net income attributable to common stockholders is computed by subtracting from net income the portion of current year earnings that the participating securities would have been entitled to receive pursuant to their dividend rights had all of the year's earnings been distributed. No such adjustment to earnings is made during periods with a net loss, as the holders of the participating securities have no obligation to fund losses. Diluted net loss per common share is computed by using the weighted-average number of shares of common stock outstanding. Due to net losses for the years ended December 31, 2016, 2015, and 2014, basic and diluted net loss per share attributable to common stockholders were the same, as the effect of all potentially dilutive securities would have been anti-dilutive.

Recent accounting pronouncements

In March 2016, the Financial Accounting Standards Board (FASB) issued ASU 2016-09, *Compensation - Stock Compensation (Topic 718): Improvements to Employee Share Based Payment Accounting* ("ASU 2016-09") as part of the FASB simplification initiative. The new standard provides for changes to accounting for stock compensation including 1) excess tax benefits and tax deficiencies related to share-based payment awards will be recognized as income tax expense in the reporting period in which they occur; 2) excess tax benefits will be classified as an operating activity in the statement of cash flow; 3) the option to elect to estimate forfeitures or account for them when they occur; and 4) increase tax withholding requirements threshold to qualify for equity classification. ASU 2016-09 is effective for public companies for annual periods, and interim periods within those annual periods, beginning after December 15, 2016, and early adoption is permitted. The Company is currently evaluating the impact that ASU 2016-09 will have on the financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*. The new standard requires the recognition of assets and liabilities arising from lease transactions on the balance sheet and the disclosure of key information about leasing arrangements. Accordingly, a lessee will recognize a lease asset for its right to use the underlying asset and a lease liability for the corresponding lease obligation. Both the asset and liability will initially be measured at the present value of the future minimum lease payments over the lease term. Subsequent measurement, including the presentation of expenses and cash flows, will depend on the classification of the lease as either a finance or an operating lease. Initial costs directly attributable to negotiating and arranging the lease will be included in the asset. For leases with a term of twelve months or less, a lessee can

make an accounting policy election by class of underlying asset to not recognize an asset and corresponding liability. Lessees will also be required to provide additional qualitative and quantitative disclosures regarding the amount, timing and uncertainty of cash flows arising from leases. These disclosures are intended to supplement the amounts recorded in the financial statements and provide additional information about the nature of an organization's leasing activities. The new standard is effective for fiscal years beginning after December 15, 2018, and interim periods within those years, with early adoption permitted. In transition, lessees are required to recognize and measure leases at the beginning of the earliest period presented using a modified retrospective approach. The transition guidance also provides specific guidance for sale and leaseback transactions, build-to-suit leases and amounts previously recognized in accordance with the business combinations guidance for leases. The Company is currently evaluating our expected adoption method and the impact of this new standard on the financial statements.

In August 2014, the FASB issued ASU 2014-15*, Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern*. The ASU is intended to define management's responsibility to evaluate whether there is substantial doubt about an organization's ability to continue as a going concern and to provide related footnote disclosures. For all entities, the ASU is effective for annual periods ending after December 15, 2016 and interim periods within annual periods beginning after December 15, 2016. The Company adopted this standard in 2016.

3. Marketable Securities

The following table summarizes the available-for-sale securities held at December 31, 2016 (in thousands):

December 31, 2016	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
U.S. government agency securities and treasuries	$ 42,516	$ 4	$ (8)	$ 42,512
Corporate debt securities	1,554	—	—	1,554
Total available-for-sale securities	$ 44,070	$ 4	$ (8)	$ 44,066

The Company did not have available for sale securities at December 31, 2015. There were no available for sale securities held as of December 31, 2016 with maturities greater than one year.

4. Fair Value Measurements

The following sets forth the Company's assets that are measured at fair value on a recurring basis as of December 31, 2016 and December 31, 2015:

	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
December 31, 2016				
Assets:				
Cash and Cash Equivalents				
Cash	$ 2,785	$ 2,785	—	—
Money market funds	9,647	$ 9,647	—	—
US government agency securities and treasuries	4,000	—	4,001	
Total cash and cash equivalents	16,432	12,432	4,001	—
Marketable securities				
U.S. government agency securities and treasuries	42,512	—	42,512	—
Corporate debt securities	1,554	—	1,554	—
Total marketable securities	44,066	—	44,066	—
Restricted cash	2,432	2,432	—	—
Total assets	$ 62,930	$ 14,864	$ 48,067	$ —
December 31, 2015				
Assets:				
Money Market Funds	89,713	89,713	—	—
Total Assets	$ 89,713	$ 89,713	$ —	$ —

Cash and cash equivalents

The Company considers all highly liquid securities with original final maturities of three months or less from the date of purchase to be cash equivalents. As of December 31, 2016 and December 31, 2015, cash and cash equivalents are comprised of cash, money market accounts, U.S. government agency securities and corporate debt securities.

Marketable securities.

The cost of available-for-sale securities is adjusted for amortization of premiums and accretion of discounts to maturity. At December 31, 2016, the balance in the Company's accumulated other comprehensive loss was composed solely of activity related to the Company's available-for-sale marketable securities. The Company has not realized material gains or losses on sales of available-for-sale investment securities during any of the periods presented.

As of December 31, 2016, available for sale securities of approximately $15.4 million were in an unrealized loss position of $7,700. The Company has the intent and ability to hold such securities until recovery. The Company determined that there were no material changes in the credit risk of the above investments. The Company did not hold any investments with an other-than-temporary impairment as of December 31, 2016 and December 31, 2015.

5. Property and Equipment

Property and equipment consisted of the following (in thousands):

	December 31, 2016	December 31, 2015
Machinery, computers and equipment	$ 385	$ 687
Leasehold improvements	—	18
Accumulated depreciation	(31)	(330)
	$ 354	$ 375

Depreciation expense was $159,000, $54,000 and $35,000 in 2016, 2015 and 2014, respectively.

Following the discontinuation of research and development activities and corresponding workforce reduction, the Company determined that certain property and equipment was impaired and recognized an impairment charge of $1.4 million in restructuring charges in the statement of operations for the year ended December 31, 2016 (see Note 9).

6. Accrued expenses

Accrued expenses consist of the following (in thousands):

	December 31,	
	2016	2015
Accrued restructuring	$ 1,609	$ —
Professional fees	259	437
Clinical trial costs	220	489
Compensation and related items	154	1,151
Other	158	137
	$ 2,400	$ 2,214

Included in accrued restructuring are severance and benefits of approximately $1,097,000 and the current portion of contract termination costs related to a leased facility of $512,000. See Note 9 for additional discussion.

7. Shareholders' Equity

Common Stock

The voting, dividend and liquidation rights of holders of shares of common stock are subject to and qualified by the rights, powers and preferences of the holders of shares of convertible preferred stock. The Company's common stock has the following characteristics:

The holders of shares of common stock are entitled to one vote for each share of common stock held at all meetings of stockholders and written actions in lieu of meetings.

The holders of shares of common stock are entitled to receive dividends, if and when declared by the Company's board of directors. Cash dividends may not be declared or paid to holders of common stock until paid on each series of outstanding convertible preferred stock in accordance with their respective terms. As of December 31, 2016, no cash dividends have been declared or paid since the Company's inception.

Reverse Stock Split

In September 2015, the stockholders approved a reverse stock split of the outstanding shares of the Company's common stock, Series A convertible preferred stock, Series B convertible preferred stock, Series B-1 convertible preferred stock, Series C convertible preferred stock and Series D convertible preferred stock in which every 15 shares were converted into one share of the related stock. No fractional shares were issued as a result of the reverse stock split. The par value for each class of stock remained at $0.001 per share. The effect of the reverse stock split has been recognized retroactively, in all share and price per share data presented in the financial statements and the notes to the financial statements.

Offerings

In September 2015, the Company entered into a new grant contract with Cancer Prevention and Research Institute of Texas ("CPRIT") in connection with an award of approximately $16.8 million. The 2015 award was in the form of an agreement by CPRIT to purchase $16.8 million of shares of common stock of the Company in a private placement concurrent with the initial public offering of the Company's common stock. On October 5, 2015, CPRIT purchased 2,395,010 shares of the Company's common stock at $7.00 per share. Net proceeds from the private placement, after related transaction offering costs, were approximately $16.6 million.

In October 2015, the Company issued 6.25 million shares of common stock in an underwritten public offering, with a price of $7.00 per share. The underwriters purchased an additional 704,962 shares of common stock pursuant to their options to purchase additional shares. The Company received aggregate net proceeds of approximately $43.7 million in the public offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by the Company.

8. Stock Option Plans

2008 Long Term Incentive Plan

During 2008, the Company adopted the 2008 Long Term Incentive Plan, which allows for incentive stock options for its employees and nonqualified stock options (inclusive of restricted stock units and stock appreciation rights) (the "2008 Plan") for employees and nonemployees under which an aggregate of 330,582 stock options and stock purchase rights may be granted. In December 2013, the total amount available for grant under the 2008 Plan was increased by 224,200 to 554,782. In March 2014, the Company's board of directors approved an increase of 115,153 shares available for grant pursuant to the 2008 Plan to 669,935. In March 2015, the total amount of available to grant under the 2008 Plan was increased in conjunction with the Company's offering of Series D preferred stock by 391,650 shares to 1,061,585. Options under the 2008 Plan have a maximum life of 10 years. Options vest at various intervals, as determined by the Company's board of directors at the date of grant.

2015 Equity Incentive Plan

In August 2015, the Company's board of directors approved the 2015 Equity Incentive Award Plan, (the "2015 Plan"), which was effective in connection with the pricing of the IPO on September 30, 2015. The 2015 Plan provides for the granting of a variety of stock-based compensation awards, including stock options, stock appreciation rights, or SARs, restricted stock awards, restricted stock unit awards, deferred stock awards, dividend equivalent awards, stock payment awards, performance awards and other stock-based awards. The 2015 Plan is the successor to the 2008 Plan and the 706,656 options outstanding in the 2008 Plan at December 31, 2016 may be transferred to the 2015 Plan if awards thereunder terminate, expire or lapse for any reason without the delivery of shares to the holder thereof. As of December 31, 2016, 88,510 shares have been transferred from the 2008 Long Term Incentive Plan to the 2015 Equity Incentive Plan for awards that have terminated, expired or lapsed. Under the 2015 Plan, 1,671,800 shares of the Company's common stock were initially authorized and reserved for issuance. In addition, 1,041,526 shares of the Company's common stock were authorized and reserved for issuance in the first quarter of 2016, for a total of 2,801,836 authorized for grant under the 2015 Plan at December 31, 2016.

2015 Employee Stock Purchase Plan

In August 2015, the Company's board of directors approved the 2015 Employee Stock Purchase Plan (the "ESPP"), which was effective in connection with the pricing of the IPO on September 30, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount through payroll deductions of up to 15% of their eligible compensation, subject to any plan limitations. The ESPP generally provides for set offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last trading day of the offering period. Employees exercised their option to purchase 5,525 shares of common stock under the ESPP as of December 31, 2016. Shares available for future purchase under the ESPP were 369,960 at December 31, 2016; however, the Company has suspended future issuances of Mirna Therapeutics, Inc. common stock under the ESPP plan.

Stock Option Activity

The Company's stock option activity for the years ended December 31, 2016, 2015, and 2014 was as follows:

	Number of Shares	Weighted-Average Exercise Price	Weighted-Average Contractual Life (years)
Outstanding at December 31, 2013	354,833	$ 2.40	8.80
Granted	234,447	8.10	
Exercised	(80,816)	2.40	
Forfeited/canceled	(7,553)	4.70	
Outstanding at December 31, 2014	500,911	4.95	8.85
Granted	1,057,082	6.82	
Exercised	(28,516)	2.36	
Forfeited/canceled	(18)	7.50	
Outstanding at December 31, 2015	1,529,459	6.28	9.00
Granted	928,250	4.41	
Exercised	(5,313)	1.65	
Forfeited/canceled	(547,182)	6.26	
Outstanding at December 31, 2016	1,905,214	$ 5.39	7.49
Options Exercisable at December 31, 2016	838,922	$ 5.45	5.57

The total intrinsic value of options exercised during the years ended December 31, 2016, 2015 and 2014 was $13,000, $160,000, and $383,000, respectively. The intrinsic value of options exercisable and total options outstanding at December 31, 2016 was $28,000 and $28,000, respectively. The total fair value of options vested during the years ended December 31, 2016, 2015 and 2014 was $1,524,000, $858,000 and $198,000, respectively.

Stock Based Compensation Expense

Total stock-based compensation expense was allocated as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Research and development expense	$ 372	$ 306	$ 110
General and administrative expense	1,220	679	298
	$ 1,592	$ 985	$ 408

There was approximately $3.5 million of unrecognized compensation cost related to the stock options granted under the 2015 Plan, which is expected to be amortized over the next 2.6 years. There were no restricted stock units or stock appreciation rights granted under the 2015 Plans of December 31, 2016.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option-pricing model that uses the assumptions noted in the table below. Expected volatility for the Company's common stock was determined based on an average of the historical volatility of a peer group of similar companies. The Company has limited stock option exercise information. Accordingly, the expected term of stock options granted was calculated using the simplified method, which represents the average of the contractual term of the stock option and the weighted-average vesting period of the stock option. The assumed dividend yield is based upon the Company's expectation of not paying dividends in the foreseeable future. The risk-free rate for periods within the expected life of the stock option is based upon the U.S. Treasury yield curve in effect at the time of grant.

The assumptions used in the Black-Scholes option-pricing model for stock option grants during the years ended December 31, 2016, 2015 and 2014 are as follows:

	Year Ended December 31,		
	2016	2015	2014
Expected life (in years)	5.5 - 6.1	5.9 - 6.7	5.8-6.1
Risk-free interest rate	1.1% - 1.6%	1.6% - 2.0%	1.8% - 2.8%
Expected volatility	76.9% - 79.5%	77.5% - 84.7%	75.3% - 85.4%
Expected dividend yield	—	—	—
Weighted-average grant date fair value per share	$2.97	$4.73	$5.40

No related tax benefits were recognized for the years ended December 31, 2016, 2015 or 2014.

9. Restructuring Charges

On September 20, 2016, Mirna announced its decision to close the ongoing Phase 1 study of MRX34 and voluntarily halted the enrollment and dosing of patients in the study. Following the announcement, the Company received verbal notice from the U.S. Food and Drug Administration ("FDA") on September 28, 2016 that its Investigational New Drug MRX34 had been placed on full clinical hold. Following the Company's announcement and notification from the FDA, Mirna's Board of Directors approved a reduction of the total number of full-time employees from 36 to 12. The Company also committed to retention payments to certain key employees if such employees remained with the Company until June 30, 2017 or were terminated by Mirna without cause prior to such date. Restructuring charges are expected to be incurred through June 30, 2017 and total approximately $4.7 million, including non-cash impairment charges of $1.4 million.

Restructuring charges were as follows (in thousands):

	Year ended December 31, 2016
Employee severance and related costs	$ 1,554
Contract termination costs	1,486
Asset impairment costs	1,402
Total restructuring charges	$ 4,442

There were no restructuring charges for the year ended December 31, 2015.

The accrued restructuring activity during the year ended December 31, 2016 was as follows (in thousands):

	Employee severance and related costs	Contract Termination Costs	Total
Balance at December 31, 2015	—	—	—
Restructuring Charge	$ 1,554	$ 1,486	$ 3,040
Cash payments	(457)	—	(457)
Other (1)	—	79	79
Balance at December 31, 2016	$ 1,097	$ 1,565	$ 2,662

(1) Other includes the effect of historical deferred rent and prepaid balances recognized under the leases terminated under contract termination costs.

Employee severance and related costs

Of the total accrued restructuring balance of $2.7 million, approximately $1.6 million has been presented as a current liability and $1.1 million has been presented as a long-term liability. Employee severance and benefits costs recorded in

restructuring charges for the year ended December 31, 2016 included $1.5 million in employee severance and benefits costs and $0.1 million for accrued retention payments which are being recognized over the respective employee's service period.

Contract termination costs

Contract termination costs recorded in restructuring charges for the year ended December 31, 2016 of $1.5 million related to the Company's determination to cease use and not occupy the Company's headquarters and research facility in connection with the lease the Company entered into in June 2016 (see Note 14). In connection with this determination, the Company recorded a liability of $1.6 million, which is equal to the fair value of the lease obligation at the cease-use date of November 20, 2016, after adjusting for the effects of prepaid and deferred rent balances related to the lease, of which $1.1 million has been recorded as a long term liability in the balance sheets within Lease obligations. The Company estimated the liability for the contract termination costs associated with the lease as of the cease-use date based on the discounted present value of the remaining lease payments, considering future estimated sublease income, estimated broker fees and contractual executory costs.

Asset impairment costs

Following the discontinuation of research and development activities and corresponding workforce reduction, the Company determined that certain property and equipment was impaired and recognized an impairment charge of $1.4 million in restructuring expense in the statement of operations for the year ended December 31, 2016. Of the total impairment charge, approximately $555,000 relates to the impairment of lab equipment which had a salvage value of $320,000 based on a third party appraisal of the lab equipment, which was sold for $325,000 in February 2017 (see Note 17). In addition, the Company recognized an impairment of $591,000 in construction in progress for the Company's planned headquarters and research facility associated with the termination of the lease contract discussed above. Further, following the workforce reduction, the Company sold or donated its remaining office equipment with the exception of nominal office equipment necessary to continue administrative functions and the closure of its Phase 1 clinical trial, resulting in an impairment of furniture, computers and equipment and leasehold improvements of $256,000.

10. Income Taxes

The Company recorded no provision for income taxes as of December 31, 2016 due to reported net losses since inception.

A reconciliation of the expected income tax benefit (expense) computed using the federal statutory income tax rate to the Company's effective income tax rate is as follows for the years ended December 31, 2016, 2015 and 2014 (in thousands):

	2016	2015	2014
Income tax benefit computed at federal statutory tax rate	$ (8,931)	$ (8,494)	$ (5,383)
Change in valuation allowance	9,287	9,002	5,675
General business credits	(572)	(661)	(386)
Other	216	153	94
Total	$ —	$ —	$ —

The Company has established a valuation allowance due to uncertainties regarding the realization of deferred tax assets based upon the Company's lack of earnings history. During the year ended December 31, 2016, the valuation allowance increased by $9.3 million. Significant components of the Company's deferred tax assets and liabilities as of December 31, 2016 and 2015 are as follows (in thousands):

	2016	2015
Net operating loss carryforwards	$ 27,518	$ 19,562
Depreciation and amortization	1,367	1,207
Stock-based compensation	597	260
Credit carryforwards	1,717	1,147
Prepaid expenses	—	—
Accrued liabilities	538	264
Total deferred tax assets	31,737	22,440
Valuation allowance	(31,737)	(22,440)
Net deferred tax asset	$ —	$ —

As of December 31, 2016 and 2015, the Company had net operating loss ("NOL") carryforwards for federal income tax purposes of approximately $80.9 million and $57.5 million, respectively. As of December 31, 2016 and 2015, the Company also had available research and development tax credits for federal income tax purposes of approximately $1,441,000 and $985,000, respectively. If not utilized, these carryforwards expire at various dates beginning in 2028. As of December 31, 2016, the Company had state research and development tax credit carryforwards of approximately $267,000, which will begin to expire in 2024 if not utilized.

Utilization of the NOL carryforwards and tax credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred previously or that could occur in the future, as provided by Section 382 of the Internal Revenue Code of 1986 ("Section 382"), as well as similar state provisions. Ownership changes may limit the amount of NOL carryforwards and tax credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an ownership change, as defined by Section 382, results from transactions that increase the ownership of 5% shareholders in the stock of a corporation by more than 50 percentage points in the aggregate over a three-year period. The Company has not performed a study to determine whether any ownership change has occurred since the Company's formation through December 31, 2016. However, the Company believes that it has experienced at least one ownership change in the past and that it may experience additional ownership changes as a result of subsequent shifts in its stock ownership. Should there be an ownership change that has occurred or will occur, the Company's ability to utilize existing carryforwards could be substantially restricted.

The Company applies the accounting guidance in ASC 740 related to accounting for uncertainty in income taxes. The Company's reserves related to taxes are based on a determination of whether, and how much of, a tax benefit taken by the Company in its tax filings or positions is more likely than not to be realized following resolution of any potential contingencies

present related to the tax benefit. As of December 31, 2016 and 2015, the Company had no unrecognized tax benefits. During the years ended December 31, 2016 and 2015, the Company had no interest and penalties related to income taxes.

The Company files income tax returns in the U.S. federal and Texas jurisdictions. As of December 31, 2016, the statute of limitations for assessment by the Internal Revenue Service ("IRS") is open for the 2013 and subsequent tax years, although carryforward attributes that were generated for tax years prior to then may still be adjusted upon examination by the IRS if they either have been, or will be, used in a future period. The 2012 and subsequent tax years remain open and subject to examination by the State of Texas. There are currently no federal or state income tax audits in progress.

11. Shared Services Agreement with Asuragen

On November 3, 2009, the Company entered into an agreement with Asuragen under which Asuragen shares space with and provides services to the Company in support of the Company's business. Such services have included human resources, finance and accounting, information technology, purchasing, shipping and receiving, equipment use, and various facility expenses. The Company pays Asuragen a monthly service fee for the services provided by Asuragen to the Company, which does not include direct charges incurred by Asuragen on behalf of the Company. The Company paid Asuragen approximately $316,000, $490,000 and $506,000 for the years ended December 31, 2016, 2015 and 2014, respectively.

On October 31, 2014, the Company entered into a sublease agreement with Asuragen for use of office, laboratory and shared space. Total rent expense was approximately $59,000 and $89,000 for the year ended December 31, 2016 and 2015, respectively. Both the lease and the shared service agreements expired on August 31, 2016.

12. Retirement Plan

The Company sponsors a defined contribution plan that provides all eligible employees an opportunity to accumulate funds for retirement. Employees who have completed 90 days of service and are at least 21 years of age may contribute to this plan, and these contributions are matched by the employer on a basis that is determined annually by the Company's board of directors. The Company may also make profit sharing contributions to the plan. Employer contributions for 2016, 2015 and 2014 were approximately $169,000, $117,000 and $91,000, respectively.

13. License Agreements

Rosetta Genomics Ltd.

In December 2015, the Company entered into a Patent License Agreement (the "License Agreement") with Rosetta Genomics Ltd. ("Rosetta"), licensing to the Company certain patents owned or controlled by Rosetta as specified in the License Agreement. Under the License Agreement, Rosetta has granted the Company a non-assignable, non- transferable, worldwide license for certain patents in connection with the development and commercialization of products that relate to the tumor suppressor microRNA MIR-34 ("Products"). This license is exclusive with respect to Products that relate to MRX34, the Company's first product candidate which has been placed on full clinical hold by the Food & Drug Administration ("FDA") and non-exclusive for products that are not related to MRX34.

Under the License Agreement, the Company paid Rosetta an up-front, non- refundable payment of $1.6 million in January 2016, which was accrued as an expense within research and development for the year ended December 31, 2015. The Company shall also be obligated to pay low single- digit royalties on net sales of Products, as well as royalties on sublicense revenues. Certain development and regulatory milestone payments totaling $3 million may also be payable in connection with specified types of Products, upon the achievement of certain development and/ or regulatory milestone events.

Marina Biotech, Inc.

In December 2011, the Company entered into a licensing agreement with Marina, pursuant to which Marina granted to the Company a license to liposomal delivery technology, NOV340, known under the brand name "SMARTICLES," to develop and commercialize drug products incorporating Marina's delivery system exclusively in combination with the Company's first therapeutic product, MRX34, which has been placed on full clinical hold by the FDA. In December 2013, the license agreement was amended to include three additional specific mimics selected by the Company to use with SMARTICLES on an exclusive basis, and in May 2015, the license agreement was further amended to reduce the amount of a specific milestone payment and to provide for the prepayment of such milestone payment. In August 2015, the Company also entered into a side letter to the license agreement, under which it exercised its right to select an additional specific microRNA, in exchange for the payment of a specified selection fee payment.

The Company has cumulatively paid Marina approximately $2.1 million through December 31, 2016 in up-front and milestone payments and as consideration for the inclusion within the license of four additional microRNA compounds. Although the Company has discontinued its research and development activities, the Company would be required to make payments to Marina based upon the achievement of certain development and regulatory milestones, totaling up to $6 million in the aggregate for each licensed product. The Company has agreed to pay up to an additional $4 million per licensed product upon the achievement of certain regulatory milestones for a specified number of additional indications, leading to a maximum cap on all milestone payments of $10 million per product. The exception to this is for the Company's first therapeutic product, MRX34, where the aggregate of all remaining development and regulatory milestone payments due to Marina, including for all additional indications, is $4.0 million.

In addition to milestone payments, the Company will be required to pay low single digit royalties on net sales of licensed products other than MRX34, subject to customary reductions and offsets. As a result of the Company's 2013 amendment to the agreement with Marina, the Company is no longer required to pay a royalty to Marina with respect to sales of the Company's first therapeutic product, MRX34. If the Company sublicenses its rights under the license from Marina, for each optioned microRNA compound covered by such sublicense the Company is required to pay a specified lump-sum payment representing the remainder of the selection fee for the inclusion of such microRNA compound within the scope of the license agreement, as well as a portion of any revenue the Company receives from such sublicensees at a tiered percentage between the very low single digits and the mid-teens, depending on the circumstances in which the sublicense is entered into.

Yale University

In 2006, Asuragen entered into an exclusive license agreement with Yale University ("Yale") under certain patent rights relating to microRNAs arising from the laboratory of Dr. Frank Slack. This agreement was assigned to the Company by Asuragen in connection with the Company's acquisition of certain assets, including patent rights, in 2009. In February 2014, the Company as successor-in-interest to Asuragen, amended and restated the exclusive license agreement. Some of the patent filings in the Company's intellectual property portfolio that are licensed to the Company by Asuragen are also included in the patents licensed under the agreement with Yale. The Company will be required to pay royalties to Yale on net sales of licensed products that contain specified microRNAs, at a percentage ranging from the very low to the low single digits, subject to customary reductions and offsets. The Company will also be required to pay to Yale a portion of specified gross revenue that the Company receives from the Company's sublicensees at a percentage in the mid-single digits.

The Company will be required to make payments for achievement of certain development and regulatory milestones by products containing one specified microRNA and covered by the licensed patents, of up to $600,000 in the aggregate for each such product, subject to reduction in certain circumstances. In addition, the Company is required to pay an annual license maintenance fee and minimum annual royalties under certain circumstances.

The Company provided Yale University with notice of termination effective March 2017, following the discontinuation of its research and development activities.

14. Commitments and Contingencies

Operating Lease

In June 2016, the Company entered into a lease for its corporate headquarters and research facility in Austin, Texas (the “Headquarters”) under an operating lease agreement (the “Lease”). The Lease commenced on January 1, 2017 (the "Commencement Date"). The initial term of the lease is for a 123 month period, with the option to extend the lease for up to two consecutive 60 month terms. Rent expense under the Lease for year ended December 31, 2016 through the cease-use date discussed in Note 9 was approximately $165,000.

The Lease provides annual base rent of approximately $600,000 in the first year after a three-month rent-free period following the Commencement Date, with subsequent annual increases of approximately 3% in the annual base rent. In connection with the Lease, the landlord has provided a tenant improvement allowance of approximately $1.9 million to be used by the Company to build-out certain improvements to the Headquarters. The Lease also provides for an additional improvement allowance of up to $1.3 million. The additional allowance, if exercised, will amortize over 120 months on a straight-line basis. There have been no draws on the additional improvement allowance as of December 31, 2016.

Mirna has obtained a standby letter of credit for the initial amount of approximately $2.4 million (the "Letter of Credit"), which may be drawn down by the landlord in the event of default. If Mirna meets certain requirements, the amount due under the Letter of Credit may be reduced to approximately $800,000.

In November 2016, following the workforce reduction described in Note 8, the Company determined to cease use and not occupy the headquarters and research facility under the Lease. See Note 9 to the financial statements for further information on the accounting for the Lease.

Under the Lease, future minimum payments payable are approximately as follows:

Period ending December 31,	Operating Lease
2017	$ 450,929
2018	614,855
2019	633,364
2020	652,340
2021 and thereafter	4,565,888
Total	$ 6,917,376

CPRIT

In August 2010, the Company entered into a grant contract with the Cancer Prevention and Research Institute of Texas (CPRIT), under which it received a $10.3 million commercialization award from the State of Texas through CPRIT. CPRIT was established to expedite innovation and commercialization in the area of cancer research and to enhance access to evidence-based prevention programs and services throughout the State of Texas. The award was a three-year award that was funded annually, and the contract terminated on January 31, 2014, subject to the Company's obligations to make certain payments that survive termination. Under the terms of the award, the Company will be required to pay to CPRIT a portion of the Company's revenues from sales of certain products by the Company, or received from our licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to the Company's right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. The 2010 grant contract also contains a provision that provides for repayment to CPRIT some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas.

Legal Contingencies

The Company does not currently have any contingencies related to ongoing legal matters.

15. Net Loss Per Share Attributable to Common Stockholders

The following table summarizes the computation of basic and diluted net loss per share attributable to common stockholders of the Company (in thousands, except share and per share data):

	Year Ended December 31,		
	2016	2015	2014
Net loss	$ (26,268)	$ (24,983)	$ (15,834)
Accretion of convertible preferred stock to redemption value	—	(449)	—
Accrued dividends on convertible preferred stock	—	(3,871)	(2,824)
Net loss attributable to common stockholders—basic and diluted	(26,268)	(29,303)	(18,658)
Weighted-average number of common shares—basic and diluted	20,833,963	5,010,323	64,131
Net loss per share attributable to common stockholders—basic and diluted	$ (1.26)	$ (5.85)	$ (291.00)

The following potentially dilutive securities outstanding, prior to the use of the treasury stock method or if-converted method, have been excluded from the computation of diluted weighted-average common shares outstanding, because including them would have had an anti-dilutive effect due to the losses reported.

	December 31,		
	2016	2015	2014
Convertible preferred stock	—	7,921,490	5,599,939
Stock options	1,905,214	1,529,459	500,911
	1,905,214	9,450,949	6,100,850

16. Selected Quarterly Data (unaudited)

The following table contains quarterly financial information for 2016 and 2015. The operating results for any quarter are not necessary indicative of results for any future period.

	2016 Quarter Ended			
	December 31	September 30	June 30	March 31
Operating Expenses:				
Research and development	$ 2,341	$ 3,384	$ 3,682	$ 4,523
General and administrative	1,999	1,940	2,049	2,130
Restructuring charges	4,442	—	—	—
Loss on disposal of assets	—	128		
Total operating expenses	8,782	5,452	5,731	6,653
Other (income)	(88)	(87)	(93)	(82)
Net loss	(8,694)	(5,365)	(5,638)	(6,571)
Net loss per share attributable to common stockholders—basic and diluted	(0.42)	(0.26)	(0.27)	(0.32)

	2015 Quarter Ended			
	December 31	September 30	June 30	March 31
Operating Expenses:				
Research and Development	$ 6,363	$ 4,683	$ 4,499	$ 3,402
General and Administrative	2,462	1,556	1,185	877
Total operating expenses	8,825	6,239	5,684	4,279
Other (income)	(36)	(8)	—	—
Net loss	(8,789)	(6,231)	(5,684)	(4,279)
Net loss attributable to common stockholders	(8,890)	(7,785)	(7,229)	(5,397)
Net loss per share attributable to common stockholders—basic and diluted	(0.45)	(82.16)	(78.87)	(60.99)

17. Subsequent Events

Sale of Lab Equipment

In February 2017, the Company entered into an Asset Purchase Agreement for the sale of the Company's Lab Equipment with a third party for cash consideration of $325,000. The selling price of the Lab Equipment approximated its book value at December 31, 2016.

ITEM 9. ***CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE***

None.

ITEM 9A. ***CONTROLS AND PROCEDURES***

Evaluation of Disclosure Controls and Procedures

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act refers to controls and procedures that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2016, the end of the period covered by this Annual Report on Form 10-K. Based upon such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, our Principal Executive Officer and Principal Financial Officer 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 and includes 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 our financial statements.

Under the supervision and with the participation of our management, including our Principal Executive Officer and Principal Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on criteria established in "Internal Control-Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Our management concluded that our internal control over financial reporting was effective as of December 31, 2016.

Attestation Report of the Registered Public Accounting Firm

This Annual Report on Form 10-K does not include an attestation report of our registered public accounting firm due to the deferral allowed under the JOBS Act for emerging growth companies.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the period covered by this Annual Report on Form 10-K that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. ***OTHER INFORMATION***

None.

PART III

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE*

The following table sets forth information regarding our executive officers and directors as of March 1, 2017:

Name	Age	Position/Office Held With the Company	Director Since	Director Term Expires
Executive Officers				
Paul Lammers, M.D., M.Sc.	59	President and Chief Executive Officer, Director	2009	2018
Vincent O'Neill, M.D.	48	Chief Medical Officer		
Alan Fuhrman	60	Chief Financial Officer		
Casi DeYoung	46	Chief Business Officer		
Non-Employee Directors				
Lawrence M. Alleva	67	Director	2014	2017
Peter S. Greenleaf	47	Director	2016	2019
Edward Mathers	57	Director	2012	2018
Perry Nisen, M.D., Ph.D.	61	Director	2016	2019
Michael Powell, Ph.D.	62	Director	2012	2017
Matthew Winkler, Ph.D.	64	Director	2007	2019

Executive Officers

Paul Lammers, M.D., M.Sc. Dr. Lammers has served as a member of our board of directors and as our President and Chief Executive Officer since November 2009. Previously, Dr. Lammers was the President of Repros Therapeutics Inc., or Repros Therapeutics, a biopharmaceutical company, from February 2009 until October 2009. From August 2002 until September 2008, Dr. Lammers served as the Chief Medical Officer for EMD Serono, Inc., a biopharmaceutical division of Merck KGaA, a global pharmaceutical and chemical group. Previously, Dr. Lammers served as the Senior Vice President of clinical and regulatory affairs at Zonagen, Inc., which later became Repros Therapeutics. Dr. Lammers began his career with Organon International, a pharmaceutical company, spending eight years in the commercial and clinical operations in Europe and the United States. Dr. Lammers received a M.Sc. and M.D. from the Catholic University (Radboud University) in Nijmegen, The Netherlands. Dr. Lammers has been chosen to serve on our board of directors due to his management experience in multiple pharmaceutical and biopharmaceutical companies and drug development.

Vincent O'Neill, M.D., Bsc, MRCP (UK). Dr. O'Neill has served as Chief Medical Officer since April 2016. He previously served as the Chief Medical Officer of Exosome Diagnostics, a healthcare company, from June 2014 to March 2016. From June 2012 to May 2014, Dr. O'Neill served as the Global Head of Personalized Medicine and Companion Diagnostics at Sanofi S.A., a multinational pharmaceutical company. Before that, Dr. O'Neill was employed as a Group Director at Genentech, Inc., a biotechnology company, from February 2009 to June 2012. Dr. O'Neill has also served at GlaxoSmithKline, Beatson Oncology Centre, F. Hoffmann La-Roche and the University of Glasgow. Dr. O'Neill holds a BSc (Hons), MBChB and an M.D. from the University of Glasgow.

Alan Fuhrman. Mr. Fuhrman has served as our Chief Financial Officer since September 2015. Mr. Fuhrman previously served as the Chief Financial Officer of Ambit Biosciences Corporation, a biopharmaceutical company, from October 2010 through the company's initial public offering in 2013 and until its sale to Daiichi Sankyo for up to $410 million. Prior to this role, Mr. Fuhrman served as Chief Financial Officer of Naviscan, Inc., a privately-held medical imaging company, from November 2008 until September 2010, and as Chief Financial Officer of Sonus Pharmaceuticals, Inc., a pharmaceutical company, from September 2004 until August 2008. Mr. Fuhrman is a member of the board of directors of Loxo Oncology, Inc., a biopharmaceutical company. Earlier in Mr. Fuhrman's career he practiced as a CPA with Coopers and Lybrand. Mr. Fuhrman received a B.S. in both Business Administration and Agricultural Economics from Montana State University.

Casi DeYoung. Ms. DeYoung has served as our Chief Business Officer since March 2014. From May 2008 to December 2013, Ms. DeYoung served as the Vice President of Business Development for Reata Pharmaceuticals, Inc., a biopharmaceutical company. Previously, Ms. DeYoung served as the Vice President of Business Development for ODC Therapy, Inc., an immunotherapy company. From 2000 to 2005, Ms. DeYoung served in various roles, including the Director of Global Oncology Operations, for EMD Pharmaceuticals, Inc., the U.S. affiliate of Merk KGaA, a global healthcare company. Ms. DeYoung received a B.S. in Chemistry from Southwestern University and an M.B.A. from the University of Texas at Austin.

Non-Employee Directors

Lawrence M. Alleva. Mr. Alleva joined our board in July 2014. Prior to his retirement in June 2010, Mr. Alleva worked with PricewaterhouseCoopers LLP, or PwC, for 39 years, 28 of which as a partner with the firm. Mr. Alleva served clients primarily in the technology sector, including numerous pharmaceutical and biotechnology companies. Additionally, he served PwC in a variety of office, regional and national practice leadership roles, most recently as the U.S. Ethics and Compliance Leader (Assurance) for PwC from 2006 until his retirement. Mr. Alleva is a Certified Public Accountant (inactive). Mr. Alleva received a B.S. from Ithaca College (magna cum laude) and attended Columbia University's Executive MBA program. Mr. Alleva also serves as a director for public companies Tesaro Inc., Bright Horizons Family Solutions, and Adaptimmune Ltd., and previously served on the board of GlobalLogic Inc. Mr. Alleva has been chosen to serve on our board of directors due to his financial and accounting experience as a director and a public accounting partner serving multiple healthcare, pharmaceutical and biopharmaceutical companies.

Peter S. Greenleaf. Mr. Greenleaf has been the Chief Executive Officer and a Director of Sucampo Pharmaceuticals, Inc., a biopharmaceutical company, or Sucampo, since March 2014 and was appointed chairman of the board in January 2016. In addition, Mr. Greenleaf is currently a Director of Mast Therapeutics, Inc., a biopharmaceutical company, and has served since November 2015. Prior to his leadership of Sucampo, Mr. Greenleaf was CEO and a board member of Histogenics Corporation, a regenerative medicine company, from June 2013 through February 2014. From April 2006 to June 2013, Mr. Greenleaf was employed by MedImmune LLC, or MedImmune, the global biologics arm of AstraZeneca, a biopharmaceutical company, where he most recently served as President. While at MedImmune, Mr. Greenleaf was instrumental in driving the expansion of MedImmune's pipeline into over 120 clinical and pre-clinical programs and the commercialization of its marketed products. Mr. Greenleaf also served as President of MedImmune Ventures, Inc., a venture capital subsidiary of MedImmune, from January 2010 to June 2013, a wholly-owned venture capital fund within the AstraZeneca Group, where he led investment in emerging biopharmaceutical, medical device, and diagnostic companies. Prior to serving as President of MedImmune, Mr. Greenleaf was the Chief Commercial Officer of the company, responsible for its commercial, corporate development and strategy functions. Mr. Greenleaf has also held senior commercial roles at Centocor Biotech, Inc. (now Jansen Biotech, Inc.), a biotechnology company, from 1998 to 2006 and prior to that Boehringer Mannheim G.m.b.H. (now Roche Holdings), a pharmaceutical company, from 1996 to 1998. Mr. Greenleaf currently chairs the Maryland Venture Fund Authority, whose vision is to oversee implementation of InvestMaryland, a public-private partnership to spur venture capital investment in the state. Mr. Greenleaf is also a member of the board of directors of the Biotechnology Industry Organization (BIO), where he also serves on the Governing Board of the Emerging Companies Section. He is also a member of the board of directors of the Pharmaceutical Research and Manufacturers of America (PhRMA). Mr. Greenleaf's previous Board appointments include the University of Maryland Baltimore Foundation, Inc.; Rib-X Pharmaceuticals, biopharmaceutical company; LigoCyte Pharmaceuticals, a biopharmaceutical company (acquired by Takeda Pharmaceutical Company Limited in 2012); and Corridor Pharmaceuticals, a biopharmaceutical company. He received a M.B.A. degree from St. Joseph's University and a B.S. degree from Western Connecticut State University. Mr. Greenleaf has been chosen to serve on our board of directors due to his leadership experience and extensive commercialization, strategic planning, and drug development experience in the biopharmaceutical industry.

Edward Mathers. Mr. Mathers has served as a member of our board of directors since October 2012. Since August 2008, Mr. Mathers has been a Partner at New Enterprise Associates, Inc., or NEA, a private venture capital firm focusing on technology and healthcare investments. Mr. Mathers serves on the board of directors of the following pharmaceutical companies: Amplyx Pharmaceuticals, Inc., ObsEva SA, SunLogic, LLC, Ziarco Group Limited, Envisia Therapeutics, Inc., Ra Pharmaceuticals, Inc., Rhythm Pharmaceuticals, and Lumos Pharma. Mr. Mathers also serves on the board of directors of Liquidia Technologies, a biotechnology company. From 2002 to 2008, Mr. Mathers served as Executive Vice President, Corporate Development and Venture at MedImmune, Inc., or MedImmune, the global biologics arm of AstraZeneca, a biopharmaceutical company, and led its venture capital subsidiary, MedImmune Ventures, Inc. Before joining MedImmune in 2002, he was Vice President, Marketing and Corporate Licensing and Acquisitions at Inhale Therapeutic Systems, a biotechnology company. Previously, Mr. Mathers spent 15 years at Glaxo Wellcome, Inc. (now GlaxoSmithKline plc), a pharmaceutical company, where he held various sales and marketing positions. Mr. Mathers received a B.S. in Chemistry from North Carolina State University. Mr. Mathers has been chosen to serve on our board of directors due to his experience with the healthcare and pharmaceutical industries and his broad management experience.

Perry Nisen, M.D., Ph.D. Dr. Nisen has served as a member of our board of directors since June 2016. He has been Chief Executive Officer of Sanford Burnham Prebys Medical Discovery Institute, a non-profit medical research institute, since August 2014 and holds the Donald Bren Chief Executive Chair. From June 2004 to September 2014, Dr. Nisen served in various roles at GlaxoSmithKline plc, a pharmaceutical company, including most recently Senior Vice President of Science and Innovation, as well as Chief Medical Officer, Senior Vice President and Oncology Therapy Area Head, Senior Vice President of Cancer Research, Senior Vice President of Clinical Pharmacology and Discovery Medicine. Before that, Dr. Nisen was Divisional Vice President of Cancer Research and Oncology Development at Abbott Laboratories, Inc., a healthcare company. Dr. Nisen holds a B.S. from Stanford University and M.D. and Ph.D. degrees from the Albert Einstein College of Medicine. Dr. Nisen has been chosen to join our board of directors because of his medical and scientific expertise, experience in the healthcare industry and broad management experience.

Michael Powell, Ph.D. Dr. Powell has served as Chairman of our board of directors since October 2012. Since 1997, Dr. Powell has been a General Partner of Sofinnova Ventures, a venture capital firm. Previously, Dr. Powell has held positions at Genentech, Inc., a biotechnology company, Cytel, a research and development company, and Syntex Research Group, a pharmaceutical company. Dr. Powell is currently a director of Dauntless Pharmaceuticals, a biopharmaceutical company, Alvine Pharmaceuticals, a biopharmaceutical company, Ascenta Therapeutics, a biopharmaceutical company, Checkmate Pharmaceuticals, a biopharmaceutical company, Dauntless 1, a biopharmaceutical company, and Ocera Therapeutics, a publicly traded biopharmaceutical company. Dr. Powell is an Adjunct Professor at the University of Kansas. Dr. Powell is the Board President of the AIDS Vaccine Advocacy Coalition and serves on the advisory board of the Institute for the Advancement of Medical Innovation at the University of Kansas. Dr. Powell received a B.S. in Chemistry from Scarborough College, a Ph.D. in Physical Chemistry from the University of Toronto and completed his post-doctorate work in Bioorganic Chemistry at the University of California. Dr. Powell has been chosen to serve on our board of directors due to his experience with the life sciences and pharmaceutical industries and the venture capital industry.

Matthew Winkler, Ph.D. Dr. Winkler was our founder and has served as a member of our board of directors since December 2007, including as Chairman until October 2012. During 2008 to 2009, Dr. Winkler served as our Executive Chairman. Since January 2013, Dr. Winkler has been the Chairman of the board of directors of Asuragen, Inc., or Asuragen, a molecular diagnostic and pharmacogenomics service company, where he also served as the Chief Executive Officer from 2006 to December 2012. Prior to Asuragen, Dr. Winkler was the founder and Chief Executive Officer of Ambion, Inc., a privately held company that developed and sold research reagents for RNA analysis. Until March 2016, Dr. Winkler served on the board of Second Genome, a biotherapeutics company. Dr. Winkler received a B.S. in Genetics and a Ph.D. in Zoology from the University of California at Berkeley. Dr. Winkler was an Assistant and Associate Professor of Zoology at the University of Texas from 1983 to 1991. Dr. Winkler has been chosen to serve on our board of directors due to his management experience in the life sciences and pharmaceutical industries.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, requires the Company's directors and executive officers, and persons who own more than 10% of a registered class of the Company's equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of common stock and other equity securities of the Company. Officers, directors and greater than 10% stockholders are required by SEC regulations to furnish the Company with copies of all Section 16(a) forms they file.

To the Company's knowledge, based solely on a review of the copies of such reports furnished to the Company and written representations that no other reports were required, during the year ended December 31, 2016, all Section 16(a) filing requirements applicable to our officers, directors and greater than 10% beneficial owners were complied with, except for Mr. Alleva, Mr. Greenleaf, Mr. Mathers, Dr. Nisen, Dr. Powell, Dr. Winkler and Dr. Siegall for whom Form 4 filings relating to grants made in connection with the 2016 annual meeting were filed late due to an administrative delay.

Board Composition

Classified Board of Directors

In accordance with our amended and restated certificate of incorporation, our board of directors is divided into three classes with staggered, three-year terms as set forth below. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election.

- The Class I directors are Dr. Winkler, Mr. Greenleaf and Dr. Nisen, and their terms will expire at the 2019 Annual Meeting of Stockholders;
- The Class II directors are Mr. Alleva and Dr. Powell, and their terms will expire at the 2017 Annual Meeting of Stockholders; and
- The Class III directors are Dr. Lammers and Mr. Mathers, and their terms will expire at 2018 Annual Meeting of Stockholders.

The authorized number of directors may be changed only by resolution of the board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our management or a change in control of our company.

Leadership Structure of the Board

Our board of directors has separated the positions of Chairman of the board and Chief Executive Officer. Separating these positions allows our Chief Executive Officer to focus on our day-to-day business, while allowing the Chairman of the board to lead the board in its fundamental role of providing advice to and independent oversight of management. The board recognizes the time, effort and energy that the Chief Executive Officer is required to devote to his position in the current business environment, as well as the commitment required to serve as Chairman of the board, particularly as the board's oversight responsibilities continue to grow. While our bylaws and corporate governance guidelines do not require that our Chairman and Chief Executive Officer positions be separate, the board believes that having separate positions and having an independent outside director serve as Chairman is the appropriate leadership structure for us and demonstrates our commitment to good corporate governance. However, our board of directors will continue to periodically review our leadership structure and may make such changes in the future as it deems appropriate.

Role of Board in Risk Oversight Process

Risk assessment and oversight are an integral part of our governance and management processes. Our board of directors encourages management to promote a culture that incorporates risk management into our corporate strategy and day-to-day business operations. Management discusses strategic and operational risks at regular management meetings, and conducts specific strategic planning and review sessions during the year that include a focused discussion and analysis of the risks facing us. Throughout the year, senior management reviews these risks with the board of directors at regular board meetings as part of management presentations that focus on particular business functions, operations or strategies, and presents the steps taken by management to mitigate or eliminate such risks.

Our board of directors does not have a standing risk management committee, but rather administers this oversight function directly through our board of directors as a whole, as well as through various standing committees of our board of directors that address risks inherent in their respective areas of oversight. In particular, our board of directors is responsible for monitoring and assessing strategic risk exposure, our audit committee is responsible for overseeing our major financial risk exposures and the steps our management has taken to monitor and control these exposures. The audit committee also monitors compliance with legal and regulatory requirements. Our nominating and governance committee monitors the effectiveness of our corporate governance guidelines and considers and approves or disapproves any related-persons transactions. Our compensation committee assesses and monitors whether any of our compensation policies and programs has the potential to encourage excessive risk-taking.

Board Committees

Audit Committee

Our audit committee oversees our corporate accounting and financial reporting process. Among other matters, the audit committee:

- appoints our independent registered public accounting firm;
- evaluates the independent registered public accounting firm's qualifications, independence and performance;
- determines the engagement of the independent registered public accounting firm;
- reviews and approves the scope of the annual audit and the audit fee;
- discusses with management and the independent registered public accounting firm the results of the annual audit and the review of our quarterly financial statements;
- approves the retention of the independent registered public accounting firm to perform any proposed permissible non-audit services;

- monitors the rotation of partners of the independent registered public accounting firm on our engagement team as required by law;
- is responsible for reviewing our financial statements and our management's discussion and analysis of financial condition and results of operations to be included in our annual and quarterly reports to be filed with the SEC;
- reviews our critical accounting policies and estimates; and
- annually reviews the audit committee charter and the committee's performance.

The current members of our audit committee are Mr. Alleva, who serves as the chairman of the committee, Mr. Greenleaf and Dr. Nisen. Each of the members of our audit committee meets the requirements for financial literacy under the applicable rules and regulations of the SEC and NASDAQ. Our board of directors has determined that Mr. Alleva is an audit committee financial expert as defined under the applicable rules of the SEC and has the requisite financial sophistication as defined under the applicable rules and regulations of NASDAQ. Under the rules of the SEC, members of the audit committee must also meet heightened independence standards. Our board of directors has determined that each the members of our audit committee is independent under the heightened independence standards under the applicable rules of NASDAQ. The audit committee operates under a written charter that satisfies the applicable standards of the SEC and NASDAQ. A copy of the audit committee charter is available to security holders on the Company's website at http://investor.mirnarx.com/corporate-governance.cfm.

Compensation Committee

Our compensation committee reviews and recommends policies relating to compensation and benefits of our officers and employees. The compensation committee reviews and recommends corporate goals and objectives relevant to compensation of our Chief Executive Officer and other executive officers, evaluates the performance of these officers in light of those goals and objectives and recommends to our board of directors the compensation of these officers based on such evaluations. The compensation committee also recommends to our board of directors the issuance of stock options and other awards under our stock plans. The compensation committee will review and evaluate, at least annually, the performance of the compensation committee and its members, including compliance by the compensation committee with its charter.

The current members of our compensation committee are Dr. Powell, who serves as the chairperson of the committee, and Mr. Mathers. Each of the members of our compensation committee is independent under the applicable rules and regulations of NASDAQ, is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act and is an "outside director" as that term is defined in Section 162(m) of the U.S. Internal Revenue Code of 1986, as amended, or Section 162(m). The compensation committee operates under a written charter that satisfies the applicable standards of the SEC and NASDAQ. A copy of the compensation committee charter is available to security holders on the Company's website at http://investor.mirnarx.com/corporate-governance.cfm.

Our compensation committee has retained Radford, Inc., or Radford, a nationally-recognized compensation consulting firm, to serve as its independent compensation consultant and to conduct market research and analysis on our various executive positions, to assist the committee in developing appropriate incentive plans for our executives on an annual basis, to provide the committee with advice and ongoing recommendations regarding material executive compensation decisions, and to review compensation proposals of management. Radford reports directly to the compensation committee and does not provide any non-compensation related services to us. In compliance with the disclosure requirements of the SEC regarding the independence of compensation consultants, Radford addressed each of the six independence factors established by the SEC with our compensation committee. Its responses affirmed the independence of Radford on executive compensation matters. Based on this assessment, our compensation committee determined that the engagement of Radford does not raise any conflicts of interest or similar concerns. In addition, our compensation committee evaluated the independence of its other outside advisors to the compensation committee, including outside legal counsel, considering the same independence factors and concluded their work for our compensation committee does not raise any conflicts of interest. Our compensation committee operates under a written charter that satisfies the applicable standards of the SEC and NASDAQ.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee is responsible for making recommendations to our board of directors regarding candidates for directorships and the size and composition of our board of directors. In addition, the nominating and corporate governance committee is responsible for overseeing our corporate governance policies and reporting and making recommendations to our board of directors concerning governance matters.

The current members of our nominating and corporate governance committee are Mr. Mathers, who serves as the chairman of the committee, and Mr. Alleva. Each of the members of our nominating and corporate governance committee is an independent director under the applicable rules and regulations of NASDAQ relating to nominating and corporate governance committee

independence. The nominating and corporate governance committee operates under a written charter. A copy of the nominating and corporate governance committee charter is available to security holders on the Company's website at http://investor.mirnarx.com/corporate-governance.cfm.

Board Diversity

Our nominating and corporate governance committee is responsible for reviewing with the board of directors, on an annual basis, the appropriate characteristics, skills and experience required for the board of directors as a whole and its individual members. In evaluating the suitability of individual candidates (both new candidates and current members), the nominating and corporate governance committee, in recommending candidates for election (and, in the case of vacancies, appointing), and the board of directors, in approving such candidates, will take into account many factors, including the following:

- personal and professional integrity;
- ethics and values;
- experience in corporate management, such as serving as an officer or former officer of a publicly held company;
- experience in the industries in which we compete;
- experience as a board member or executive officer of another publicly held company;
- diversity of expertise and experience in substantive matters pertaining to our business relative to other board members;
- conflicts of interest; and
- practical and mature business judgment.

Currently, our board of directors evaluates each individual in the context of the board of directors as a whole, with the objective of assembling a group that can best maximize the success of the business and represent stockholder interests through the exercise of sound judgment using its diversity of experience in these various areas.

Code of Business Conduct and Ethics

We have adopted a code of business conduct and ethics that applies to all of our employees, officers and directors, including those officers responsible for financial reporting. The code of business conduct and ethics is available on our website at http://investor.mirnarx.com/corporate-governance.cfm. We will disclose any substantive amendments to the code of business conduct and ethics, or any waiver of its provisions, on our website. The reference to our website does not constitute incorporation by reference of the information contained at or available through our website.

Limitation on Liability and Indemnification Matters

Our amended and restated certificate of incorporation contains provisions that limit the liability of our directors for monetary damages to the fullest extent permitted by Delaware law. Consequently, our directors will not be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the Delaware General Corporation Law; or
- any transaction from which the director derived an improper personal benefit.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we are required to indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law. Our amended and restated bylaws also provide that we are obligated to advance expenses incurred by a director or officer in advance of the final disposition of any action or proceeding, and permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether we would otherwise be permitted to indemnify him or her under Delaware law.

We have entered and expect to continue to enter into agreements to indemnify our directors, executive officers and other employees as determined by our board of directors. With specified exceptions, these agreements provide for indemnification for related expenses including, among other things, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding brought against them by reason of the fact that they are or were our agents. We believe that these provisions in our amended and restated certificate of incorporation and amended and restated bylaws and indemnification agreements are necessary to attract and retain qualified directors and officers. We also maintain directors' and officers' liability insurance. This description of the limitation of liability and indemnification provisions of our amended and restated certificate of incorporation, of our amended and restated bylaws and of our indemnification agreements is qualified in its entirety by reference to these documents.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against our directors and officers for breach of their fiduciary duty. They may also reduce the likelihood of derivative litigation against our directors and officers, even though an action, if successful, might benefit us and our stockholders. Further, a stockholder's investment may be adversely affected to the extent that we pay the costs of settlement and damage. To the extent the indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, we have been advised that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. At present, there is no pending litigation or proceeding involving any of our directors, officers or employees for which indemnification is sought, and we are not aware of any threatened litigation that may result in claims for indemnification.

ITEM 11. *EXECUTIVE COMPENSATION*

The following is a discussion and analysis of compensation arrangements of our named executive officers, or NEOs. As an "emerging growth company" as defined in the JOBS Act, we are not required to include a Compensation Discussion and Analysis section and have elected to comply with the scaled disclosure requirements applicable to emerging growth companies.

We seek to ensure that the total compensation paid to our executive officers is reasonable and competitive. Compensation of our executives is structured around the achievement of individual performance and near-term corporate targets as well as long-term business objectives.

Our NEOs for fiscal year 2016 were as follows:

- Paul Lammers, M.D., M.Sc., President and Chief Executive Officer;
- Alan Fuhrman, Chief Financial Officer;
- Vincent O'Neill, M.D., Chief Medical Officer;
- Miguel Barbosa, Ph.D., Former Chief Scientific Officer; and
- Jon Irvin, Former Vice President of Finance.

2016 Summary Compensation Table

The following table shows information regarding the compensation of our named executive officers for services performed in the year ended December 31, 2016.

Name and Principal Position	Year	Salary ($)[1]	Bonus ($)[2]	Option Awards ($)[3]	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)[4]	Total ($)
Paul Lammers, M.D., M.Sc.	2016	461,516	—	484,697	—	10,600	956,813
President and Chief Executive Officer	2015	387,625	135,700	1,045,503	128,885	10,600	1,708,313
Alan Fuhrman	2016	360,187	—	176,845	—	43,600	580,632
Chief Financial Officer	2015	86,250	—	825,840	24,425	25,407	961,922
Vincent O'Neill, M.D.	2016	228,846	40,000	742,963	—	34,068	1,045,877
Chief Medical Officer							
Miguel Barbosa, Ph.D.[5]	2016	212,702	245,673	—	—	295,684	754,059
Former Chief Scientific Officer	2015	74,038	84,902	1,354,768	21,689	16,583	1,551,980
Jon Irvin[6]	2016	254,299	—	30,532	—	325,500	598,918
Former Vice President of Finance							

(1) The amount reported in the 2016 Salary column for Dr. Lammers, Alan Fuhrman and Jon Irvin is in excess of the executive's annual base salary because (i) it includes a pay out of accrued vacation following a change in the Company's vacation policy and (ii) includes an additional week of salary being paid in 2016 following a change in payroll practice.

(2) The amounts reported in the Bonus column for Drs. O'Neill and Barbosa represent sign-on bonuses.

(3) For the Option Awards column, amounts shown represents the grant date fair value of stock options granted during fiscal years 2016 and 2015, as well as incremental stock compensation expense of $813 for the acceleration of Mr. Irvin's option grants under his Separation Agreement as calculated in accordance with ASC Topic 718, excluding the impact of estimated forfeitures related to service-based vesting provisions. See Note 8 to the audited financial statements included in this Annual Report on Form 10-K for the assumptions used in calculating this amount.

(4) The amounts reported in the All Other Compensation column represent: 401(k) plan matching contributions in the amount of $10,600, $10,600, $5,797, $8,415 and $10,600 we made for Dr. Lammers, Mr. Fuhrman, Dr. O'Neill, Dr. Barbosa and Mr. Irvin respectively; $33,000 in temporary housing expenses we reimbursed for Mr. Fuhrman; $28,271 in relocation reimbursements were paid to Dr. O'Neill, pursuant to his employment agreement, in connection with his relocation to the Austin, Texas area in April 2016, including $7,431 for travel expenses, $9,985 for moving expenses and $10,855 for mortgage interest expense reimbursement for his prior residence; $16,894 in relocation reimbursements for Dr. Barbosa, pursuant to his employment agreement, in connection with his relocation to the Austin, Texas area, including $2,411 for travel expenses and $14,483 for temporary housing; cash severance payments of $270,375 and $314,900 for Dr. Barbosa and Mr. Irvin, who was paid in January 2017, respectively.

(5) Dr. Barbosa resigned as our Chief Scientific Officer effective as of June 29, 2016 and entered into a Separation and Release Agreement with us dated June 29, 2016. Please see a description of the Separation and Release Agreement in the "Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Fiscal Year End-Terms and Conditions of Miguel Barbosa's Separation and Release Agreement" below.

(6) Mr. Irvin resigned as our Vice President of Finance effective as of December 2, 2016 and entered into a Separation Agreement with us dated December 2, 2016. Please see a description of the Separation and Release Agreement in the "Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Fiscal Year End-Terms and Conditions of Jon Irvin's Separation Agreement" below.

Outstanding Equity Awards at 2016 Fiscal Year End

The following table sets forth all outstanding equity awards held by each of the named executive officers as of December 31, 2016.

		Option Awards			
Name	Vesting Commencement Date[1]	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Paul Lammers, M.D., M.Sc.	(2)	10,565	—	7.50	12/31/2019
	(2)	116,211	—	1.65	1/10/2023
	3/6/2014	49,669	22,577	8.10	3/10/2024
	1/1/2015	9,583	10,416	6.15	3/1/2025
	5/1/2015[3]	54,861	76,805	6.45	6/4/2025
	9/30/2015	23,958	52,708	7.00	9/30/2025
	3/11/2016[3]	30,938	134,062	4.36	3/11/2026
Alan Fuhrman	9/30/2016	52,243	114,937	7.00	9/30/2025
	3/11/2016	—	60,000	4.36	3/11/2026
Vincent O'Neill, M.D.	4/25/2016	—	250,000	4.42	4/25/2026
Jon Irvin	(2)	6,563	—	1.65	6/6/2023
	(2)	13,795	—	4.35	12/30/2023
	(2)	14,113	—	8.10	3/10/2024
	(2)	2,666	—	6.15	3/1/2025
	(2)	9,580	—	6.45	6/4/2025
	(2)	25,000	—	7.00	9/30/2025
	(2)	10,000	—	4.36	3/11/2026

(1) Except as otherwise noted, the shares subject to the options shall vest and become exercisable as to 1/4th of the shares subject to the option on the first anniversary of the vesting commencement date, and thereafter as to 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to us through such vesting date.

(2) The options are fully vested.

(3) The shares subject to the option vest and become exercisable as to 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to us through such vesting date.

Dr. Barbosa had no outstanding equity awards at December 31, 2016.

Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Fiscal Year End

Terms and Conditions of Employment Arrangements with our NEOs

We have entered into agreements with each of our NEOs in connection with his commencement of employment with us and, in respect of Dr. Barbosa and Mr. Irvin, in connection with his termination of employment. These agreements set forth the terms and conditions of employment of each named executive officer, including base salary, initial stock option grants, and standard employee benefit plan participation. Our board of directors or the compensation committee reviews each NEO's base salary from time to time to ensure compensation adequately reflects the NEO's qualifications, experience, role and responsibilities. Each of the NEOs are also subject to certain confidentiality, non-competition, non-solicitation and arbitration restrictive covenants. For fiscal year 2016, Dr. Lammers' annual base salary was $415,100, Mr. Fuhrman's annual base salary was $334,800, Dr. O'Neill's base salary was $340,000, Dr. Barbosa's base salary was $360,500 and Mr. Irvin's base salary was $243,000.

Pursuant to Mr. Fuhrman's employment agreement, we reimbursed Mr. Fuhrman for $33,000 in temporary housing expenses during 2016.

Pursuant to Dr. O'Neill's employment agreement, we reimbursed Dr. O'Neill for $28,271 in relocation expenses, including travel, moving and reimbursement of mortgage interest expenses for his prior residence.

Pursuant to Dr. Barbosa's employment agreement, we reimbursed Dr. Barbosa for his travel and temporary housing expenses (which amounted to a total of $16,894 in fiscal year 2016).

We have entered into change in control severance agreements with each of our NEOs that provide for severance payments and benefits upon certain qualifying terminations of employment. Pursuant to the terms of the change in control severance agreements, in the event an NEO's employment is terminated by us other than for "cause" or the executive experiences a "constructive termination" (each as defined below), then the NEO will receive as severance nine months (or 12 months in the case of Dr. Lammers) of base salary in a single cash lump sum payment and up to nine months (or 12 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement; provided, that if the termination or resignation occurs within the period commencing on a "change in control" (as defined below) and ending 12 months after a change in control, the severance will consist of 12 months (or 18 months in the case of Dr. Lammers) of base salary paid in a single cash lump sum, 100% (or 150% in the case of Dr. Lammers) of the executive's target bonus paid in a single cash lump sum, up to 12 months (or 18 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement and full vesting acceleration for each stock option and other equity award held by the NEO. The NEO must timely deliver an effective release of claims to us in order to be eligible for the foregoing severance benefits.

Dr. Barbosa received severance benefits in connection with his resignation from the Company pursuant to a separation and release agreement detailed under the section below entitled "-Terms and Conditions of Miguel Barbosa's Separation and Release Agreement."

Mr. Irvin received severance benefits in connection with his resignation from the Company pursuant to a Separation Agreement detailed under the section below entitled "-Terms and Conditions of Jon Irvin's Separation Agreement."

For purposes of the change in control severance agreements, "cause" means (i) the conviction of the NEO by a court of competent jurisdiction of a crime involving moral turpitude; (ii) the commission, or attempted commission, by the NEO of an act of fraud on us; (iii) the misappropriation, or attempted misappropriation, by the NEO of any of our funds or property; (iv) the failure by the NEO to perform in any material respect his or her obligations under the terms of his or her agreement, which such failure has gone unremedied within 10 days after we provide the NEO with written notice of such failure; (v) the knowing engagement by the NEO, without the written approval of our board of directors, in any direct, material conflict of interest with us without compliance with our conflict of interest policy; (vi) the knowing engagement by the NEO, without written approval of our board of directors, in any activity which competes with our business or which would result in a material injury to us or which otherwise violates any provision of his or her agreement, employment agreement or any confidentiality agreement; or (vii) the knowing engagement by the NEO in any activity that would constitute a material violation of the provisions of our business ethics policy, employee handbook or similar policies, if any, then in effect.

For purposes of the change in control severance agreements, "constructive termination" means the NEO's resignation from all positions he or she then holds with us if: (i) without the NEO's prior written consent, (a) there is a material diminution in his or her duties and responsibilities with us; *provided*, *however*, that a change in title or reporting relationship will not be a constructive termination; (b) there is a material reduction of the NEO's then-existing base salary; *provided*, *however*, that a material reduction in his or her base salary pursuant to a salary reduction program affecting all or substantially all of our employees and that does

not adversely affect the NEO to a greater extent than other similarly situated employees will not be a constructive termination; or (c) the NEO is required to relocate his or her primary work location to a facility or location that would increase his or her one-way commute distance by more than 50 miles from his or her primary work location as of immediately prior to such change, (ii) the NEO provides written notice outlining such conditions, acts or omissions to us within 30 days immediately following such material change or reduction, (iii) such material change or reduction is not remedied by us within 30 days following our receipt of such written notice and (iv) the NEO's resignation is effective not later than 30 days after the expiration of such 30 day cure period.

For purposes of the change in control severance agreements, "change in control" generally means (i) the transfer or exchange in a single transaction or series of related transactions by our stockholders of more than 50% of our voting stock to a person or group; (ii) a change in the composition of our board of directors over a two-year period such that 50% or more of the members of the board of directors were elected through one or more contested elections; (iii) a merger, consolidation, reorganization or business combination in which we are involved, directly or indirectly, other than a merger, consolidation, reorganization or business combination which results in our outstanding voting securities immediately before the transaction continuing to represent a majority of the voting power of the acquiring company's outstanding voting securities and after which no person or group beneficially owns 50% or more of the outstanding voting securities of the surviving entity immediately after the transaction; or (iv) the sale, exchange, or transfer of all or substantially all of our assets.

Terms and Conditions of Annual Bonuses

For 2016, all of the NEOs were eligible for cash performance-based bonuses pursuant to the achievement of certain performance objectives. The performance targets are approved annually by our board of directors. When determining the 2016 performance bonus program for the NEOs, the board of directors set certain performance goals, using a mixture of performance objectives after receiving recommendations from the compensation committee and input from our Chief Executive Officer. These performance objectives included certain financial, organizational, clinical, intellectual property and development measures. After determining performance targets, each performance target is given a different weight when determining the overall bonus amount based on the importance to the success of the Company for each performance target. For fiscal year 2016, the financial performance targets were weighted at 45%, the organizational and clinical targets were each weighted at 20% and the intellectual property and development targets were each weighted at 7.5%. For each of these performance targets under the annual bonus program, the board of directors set general performance goals, but there was no minimum or maximum achievement for each performance target; instead, the board of directors weighed the achievement, partial achievement or non-achievement for each performance target when deciding the overall achievement level. These performance goals were not expected to be attained based on average or below-average performance. The board of directors intended for the performance targets to require significant effort on the part of the NEOs and, therefore, set these targets at levels they believed would be difficult to achieve, such that average or below-average performance would not satisfy these targets.

Each NEO's target bonus opportunity is expressed as a percentage of base salary, which can be achieved by meeting the corporate performance goals. For each of the NEOs, the compensation committee (or, for Dr. Lammers, the board of directors) originally set these target percentages and review them annually to ensure they are adequate, and, while reviewing these target percentages the compensation committee (or, for Dr. Lammers, the board of directors) does not follow a formula but rather uses the factors as general background information prior to determining the target bonus opportunity rates for the participating NEOs. The compensation committee (or, for Dr. Lammers, the board of directors) sets these rates based on each participating executive's experience in his role with the company and the level of responsibility held by each executive, which the board of directors believes directly correlates to his ability to influence corporate results. For 2016, the board of directors used a guideline target bonus opportunity of 50% for Dr. Lammers, 35% for Dr. Barbosa, Mr. Fuhrman, and Dr. O'Neill and 30% for Mr. Irvin.

Corporate goals and performance targets are reviewed and approved by the compensation committee (or, for Dr. Lammers, the board of directors) prior to any allocation of the annual bonuses. In early 2017, the compensation committee (or, for Dr. Lammers, the board of directors) reviewed our 2016 company-wide performance with respect to determining bonuses for executive officers and determined not to award 2016 cash bonuses to the NEOs.

Terms and Conditions of Equity Award Grants

Each of Dr. Lammers, Mr. Fuhrman, Dr. O'Neill, and Mr. Irvin received an option to purchase our common stock in fiscal year 2016. The table above entitled "Outstanding Equity Awards at 2016 Fiscal Year End" describes the material terms of other option awards made in past fiscal years to our NEOs.

On March 11, 2016, we granted Dr. Lammers an option to purchase 165,000 shares of our common stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 1/48th of the shares subject to such option on each

monthly anniversary of the grant date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to Dr. Lammers continuing to provide services to us through such vesting date

On March 11, 2016, we granted Mr. Fuhrman an option to purchase 60,000 shares of our common stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 25% of the shares subject to the option on March 11, 2017, and as to 1/48th of the shares subject to the option on each monthly anniversary thereafter, subject to Mr. Fuhrman continuing to provide services to us through such vesting date.

On March 11, 2016, we granted Mr. Irvin an option to purchase 10,000 shares of our common stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 1/48th of the shares subject to such option on each monthly anniversary of the grant date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to Mr. Irvin continuing to provide services to us through such vesting date.

On April 25, 2016, we granted Dr. O'Neill an option to purchase 250,000 shares of our common stock having an exercise price per share equal to $4.42. The option vests and becomes exercisable as to 25% of the shares subject to the option on April 25, 2017 and as to 1/48th of the shares subject to the option on each monthly anniversary thereafter, subject to Dr. O'Neill continuing to provide services to us through such vesting date.

Terms and Conditions of 401(k) Plan

Our U.S. eligible employees, including our NEOs, participate in our 401(k) plan. Enrollment in the 401(k) plan is automatic for employees who meet eligibility requirements unless they decline participation. The 401(k) plan is intended to qualify under Section 401(k) of the Internal Revenue Service Code of 1986, as amended, so that contributions to the 401(k) plan by employees or by us, and the investment earnings thereon, are not taxable to the employees until withdrawn from the 401(k) plan, and so that contributions by us, if any, will be deductible by us when made. Under the 401(k) plan, employees may elect to reduce their current compensation by up to the statutorily prescribed annual limit and to have the amount of such reduction contributed to the 401(k) plan. Under the 401(k), for fiscal year 2016, we provide matching contributions of $0.50 per dollar up to 8% of an employee's compensation.

Terms and Conditions of Miguel Barbosa's Separation Agreement

Dr. Barbosa resigned his employment effective June 29, 2016 and entered into a Separation Agreement (the Barbosa Separation Agreement) with us on June 29, 2016. The Barbosa Separation Agreement superseded all other prior agreements between Dr. Barbosa and us. In 2016, pursuant to the Barbosa Separation Agreement, we paid Dr. Barbosa an aggregate separation payment of $270,375 (less applicable withholdings and taxes), which, consistent with the severance benefits provided under Dr. Barbosa's change in control and severance agreement for termination not in connection with a change in control, represented nine months of his base salary, in exchange for a general release of all claims against us. Dr. Barbosa also received the payment of continued health, dental and vision insurance premiums for himself for up to nine months. The Barbosa Separation Agreement also included a general release of all claims against us.

Terms and Conditions of Jon Irvin's Separation Agreement

Mr. Irvin resigned his employment effective December 2, 2016 and entered into a separation agreement (the Irvin Separation Agreement) with us on December 2, 2016. The Irvin Separation Agreement superseded all other prior agreements between Mr. Irvin and us and provided for Mr. Irvin to receive, as severance $315,900 (less applicable withholdings and taxes), which constituted 12 months of his base salary and 100% of his target bonus opportunity. The Irvin Separation Agreement also provided for the full acceleration of vesting for all options held by Mr. Irvin on his termination date as well as the payment of continued health, dental and vision insurance premiums for himself for up to 12 months. The Irvin Separation Agreement also included a general release of all claims against us.

Director Compensation

Pursuant to the Director Compensation Program, as amended, our non-employee directors are entitled to receive cash compensation, paid quarterly in arrears, as follows:

- Each non-employee director receives an annual cash retainer in the amount of $35,000 per year.
- Any non-employee Chairman receives an additional annual cash retainer in the amount of $25,000 per year.
- The chairperson of the audit committee receives additional annual cash compensation in the amount of $15,000 per year for such chairperson's service on the audit committee. Each non-chairperson member of the audit committee

receives additional annual cash compensation in the amount of $7,500 per year for such member's service on the audit committee.

- The chairperson of the compensation committee receives additional annual cash compensation in the amount of $10,000 per year for such chairperson's service on the compensation committee. Each non-chairperson member of the compensation committee receives additional annual cash compensation in the amount of $5,000 per year for such member's service on the compensation committee.
- The chairperson of the nominating and corporate governance committee receives additional annual cash compensation in the amount of $7,500 per year for such chairperson's service on the nominating and corporate governance committee. Each non-chairperson member of the nominating and corporate governance committee receives additional annual cash compensation in the amount of $3,750 per year for such member's service on the nominating and corporate governance committee.

Under the Director Compensation Program, upon a director's initial appointment or election to our board of directors, such non-employee director will receive an option (the Initial Grant) to purchase 20,000 shares of our common stock (subject to adjustment as provided in the applicable equity plan). In addition, each non-employee director who has been serving as a director for at least three months prior to any annual stockholder meeting following the date of this offering and will continue to serve as a director immediately following such annual stockholder meeting will be automatically granted, on the date of such annual stockholder meeting, an option (the Annual Grant) to purchase 10,000 shares of our common stock (subject to adjustment as provided in the applicable equity plan). The Initial Grant will vest in substantially equal installments on each of the first three anniversaries of the applicable grant date, subject to continued service through each applicable vesting date, and the Annual Grant will vest in full on the earlier of the first anniversary of the applicable grant date or immediately prior to the next annual stockholder meeting after the applicable grant date, subject to continued service through such vesting date. In addition, pursuant to the terms of the Director Compensation Program, all equity awards outstanding and held by a non-employee director will vest in full immediately prior to the occurrence of a change in control.

We reimburse all of our non-employee directors for all reasonable and customary business expenses incurred providing services to us in accordance with Company policy.

2016 Director Compensation Table

The following table sets forth information for the year ended December 31, 2016 regarding the compensation awarded to, earned by or paid to our non-employee directors:

Name(1)	Fees earned in cash	Option Awards ($)[1][2]	Total ($)
Michael Powell, Ph.D.	70,000	31,229	101,229
Lawrence M. Alleva	26,875	31,229	58,104
Peter S. Greenleaf	11,667	91,703	103,370
Edward Mathers	47,500	31,229	78,729
Perry Nisen, M.D., Ph.D.	21,250	64,400	85,650
Clay B. Siegall, Ph.D.[3]	47,500	31,229	78,729
Matthew Winkler, Ph.D.	35,000	31,229	66,229

(1) The amounts reported in the Option Awards column represent the grant date fair value of the stock options granted to the non-employee members of our board of directors during 2016 as computed in accordance with ASC Topic 718, excluding the impact of estimated forfeitures related to service-based vesting provisions. The assumptions used in calculating the grant date fair value of the stock options reported in the Option Awards column are set forth in Note 8 to the audited financial statements included in this Annual Report on Form 10-K. Note that the amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the non-employee members of our board of directors from the options.

(2) As of December 31, 2016, our non-employee directors held the following outstanding options to purchase our common stock:

Name	Shares Underlying Outstanding Options
Michael Powell, Ph.D.	23,866
Lawrence M. Alleva	44,532
Peter S. Greenleaf	30,000
Edward Mathers	21,200
Perry Nisen, M.D., Ph.D.	20,000
Clay B. Siegall, Ph.D.(3)	32,420
Matthew Winkler, Ph.D.	21,200

(3) Effective December 31, 2016, Dr. Siegall resigned from our board of directors.

Compensation Committee Interlocks and Insider Participation

During 2016, Dr. Powell and Mr. Mathers served as members of our compensation committee. During 2016, none of the members of our compensation committee had at any time been one of our officers or employees. None of our executive officers currently serves, or in the past year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers on our board of directors or compensation committee.

ITEM 12. *SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS*

Security Ownership of Certain Beneficial Owners and Management

The following table sets forth information relating to the beneficial ownership of our common stock as of March 1, 2017 by each person, or group of affiliated persons, known by us to beneficially own more than 5% of our outstanding shares of common stock;

- each of our directors and nominees for director;
- each of our NEOs; and
- all directors, nominees and executive officers as a group.

The number of shares beneficially owned by each entity, person, director, nominee or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of March 1, 2017 through the exercise of stock options or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock held by that person.

The percentage of shares beneficially owned is computed on the basis of 20,856,693 shares of our common stock outstanding as of March 1, 2017. Shares of our common stock that a person has the right to acquire within 60 days of March 1, 2017 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Mirna Therapeutics, Inc., at 1250 S Capital of Texas Highway, Austin, Texas 78746.

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Name and Address of Beneficial Owner	Beneficial Ownership			
	Number of Outstanding Shares Beneficially Owned	Number of Shares Exercisable Within 60 Days	Number of Shares Beneficially Owned	Percentage of Beneficial Ownership
5% and Greater Stockholders				
Sofinnova Venture Partners VIII, L.P.(1)	2,974,812	—	2,974,812	14.3%
Entities Associated with New Enterprise Associates(2)	2,974,517	—	2,974,517	14.2%
Pfizer Inc.(3)	2,497,586	—	2,497,586	12.0%
Cancer Prevention and Research Institute of Texas(4)	2,395,010	—	2,395,010	11.5%
Franklin Resources(5)	1,384,073	—	1,384,073	6.6%
Eastern Capital Limited(6)	1,118,741	—	1,118,741	5.4%
Named Executive Officers and Directors				
Paul Lammers, M.D., M.Sc.(7)	22,287	334,584	356,871	1.7%
Alan Fuhrman(8)	—	82,425	82,425	*
Vincent O'Neill, M.D.(9)	—	62,500	62,500	*
Miguel Barbosa, Ph.D.	—	—	—	*
Jon Irvin(10)	5,985	81,716	87,701	*
Michael Powell, Ph.D.(1)	2,974,812	5,733	2,980,545	14.3%
Lawrence M. Alleva(11)	4,025	18,444	22,469	*
Peter S. Greenleaf(12)	—	6,667	6,667	*
Edward Mathers(13)	—	4,400	4,400	*
Perry Nisen M.D., Ph.D.	—	—	—	*
Matthew Winkler, Ph.D.(14)	649,175	4,400	653,575	3.0%
All directors and executive officers as a group (12 persons)(15)	3,650,299	589,081	4,239,380	19.8%

* Indicates beneficial ownership of less than 1% of the total outstanding shares of common stock.

(1) As reported on Schedule 13D, filed with the SEC on October 8, 2015 by Sofinnova Ventures Partners VIII, L.P. ("SVP VIII"), Sofinnova Management VIII, L.L.C. ("SM VIII"), Dr. Srinivas Akkaraju, Dr. Michael F. Powell, Dr. James I. Healy, and Dr. Anand Mehra. SM VIII is the general partner of SVP VIII. The individual Managers, or the Managing Members, of SVP VIII are Michael Powell, James Healy, Srinivas Akkaraju and Anand Mehra. The Managers share voting and dispositive power with regard to the shares held directly by SVP VIII. The address of SVP VIII is 3000 Sand Hill Road, Bldg. 4, Suite 250, Menlo Park, CA 94025.

(2) As reported on Schedule 13D, filed with the SEC on October 14, 2015 by New Enterprise Associates 14, L.P. ("NEA 14"), NEA Partners 14, L.P. ("NEA Partners 14"), NEA 14 GP, LTD ("NEA 14 LTD"), M. James Barrett, Peter J. Barris, Forest Baskett, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna S. Kolluri, David M. Mott, Scott D. Sandell, Peter W. Sonsini, Ravi Viswanathan and Harry R. Weller. The shares directly held by NEA 14 are indirectly held by NEA Partners 14, the sole general partner of NEA 14. NEA 14 LTD is the sole general partner of NEA Partners 14. The individual Managers, or the Managers, of NEA 14 LTD are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna Kolluri, David M. Mott, Scott D. Sandell, Peter Sonsini, Ravi Viswanathan and Harry R. Weller. The Managers share voting and dispositive power with regard to shares held directly by NEA 14. The address of NEA 14 is 1954 Greenspring Drive, Suite 600, Timonium, MD 21903.

(3) As reported on Schedule 13G/A, filed with the SEC on February 11, 2016 by Pfizer, Inc. The address for this entity is 235 E. 42nd Street, New York, NY 10017.

(4) As reported on Schedule 13G, filed with the SEC on October 8, 2015, by Cancer Prevention and Research Institute of Texas. The address for this entity is 1701 N. Congress Avenue, Suite 6-127 Austin, TX 78701.

(5) As reported on Schedule 13G/A, filed with the SEC on February 9, 2017 by Franklin Resources, Inc. ("FRI"), Charles B. Johnson ("Charles Johnson"), Rupert H. Johnson, Jr. ("Rupert Johnson") and Franklin Advisers, Inc. ("Advisers"). Charles Johnson and Rupert Johnson each own in excess of 10% of the outstanding common stock of FRI and are the principal stockholders of FRI. Accordingly, FRI, Charles Johnson and Rupert Johnson may be deemed to be the beneficial owners of securities held by persons and entities for whom or for which FRI subsidiaries provide investment management services. FRI, Charles Johnson and Rupert Johnson disclaim any pecuniary interest in any of the securities. The address of FRI, Charles Johnson, Rupert Johnson and Advisers is One Franklin Parkway, San Mateo, CA 94403-1906.

(6) As reported on Schedule 13G, filed with the SEC on October 15, 2015 by Eastern Capital Limited, Portfolio Services Ltd. and Kenneth B. Dart. Eastern Capital Limited is a Cayman Islands corporation. Portfolio Services Ltd., a Cayman Islands corporation, owns all of the outstanding stock of Eastern Capital Limited. Kenneth B. Dart is the beneficial owner of all of the outstanding stock of Portfolio Services Ltd. Kenneth B. Dart is a director of both Eastern Capital Limited and Portfolio Services Ltd. The address for these entities is 10 Market Street #773, Camana Bay, Grand Cayman, KY1-9006, Cayman Islands.

(7) Consists of: (i) 334,584 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017 by Dr. Lammers and (ii) 22,287 shares held by Dr. Lammers.

(8) Consists of 82,425 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017.

(9) Consists of 62,500 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017.

(10) Consists of: (i) 81,716 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017 by Mr. Irvin and (ii) 5,985 shares held by Mr. Irvin.

(11) Consists of: (i) 18,444 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017 by Mr. Alleva and (ii) 4,025 shares held by the Lawrence M. Alleva Profit Sharing Plan.

(12) Consists of 6,667 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017.

(13) Consists of 4,400 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017.

(14) Consists of: (i) 4,400 shares that may be acquired pursuant to the exercise of stock options within 60 days of March 1, 2017 by Mr. Winkler and (ii) 81,716 shares held by Mr. Winkler.

(15) Includes: (i) 3,656,284 shares held by our executive officers, entities affiliated with Dr. Powell and the Lawrence M. Alleva Profit Sharing Plan and (ii) 670,797 shares that may be acquired by our current executive officers and directors pursuant to the exercise of stock options within 60 days of March 1, 2017.

Equity Plan Compensation Information

The following table provides certain information as of December 31, 2016, with respect to all of our equity compensation plans in effect on that date.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a)) (c)
Equity Compensation Plans Approved by Stockholders[1][2]	1,905,214	$ 5.39	3,878,452
Equity Compensation Plans Not Approved by Stockholders	-	-	-
Total	1,905,214	5.39	3,878,452

(1) Includes the Mirna Therapeutics, Inc. 2015 Equity Incentive Award Plan, the Mirna Therapeutics, Inc. 2008 Long Term Incentive Plan, and the Mirna Therapeutics, Inc. 2015 Employee Stock Purchase Plan.

(2) The Mirna Therapeutics, Inc. 2015 Equity Incentive Award Plan and the Mirna Therapeutics, Inc. 2015 Employee Stock Purchase Plan contain "evergreen" provisions, pursuant to which (i) the number of shares of common stock reserved for issuance or transfer pursuant to awards under the 2015 Equity Incentive Award Plan shall be increased on the first day of each year beginning in 2016 and ending in 2025, equal to the lesser of (A) five percent (5.0%) of the shares of stock outstanding (on an as converted basis) on the last day of the immediately preceding fiscal year and (B) such smaller number of shares of stock as determined by our board of directors; provided, however, that no more than 14,000,000 shares of stock may be issued upon the exercise of incentive stock options and (ii) the maximum number of our shares of our common stock which will be authorized for sale under the 2015 Employee Stock Purchase Plan is equal to the sum of (a) 167,180 shares of common stock and (b) an annual increase on the first day of each year beginning in 2016 and ending in 2025, equal to the lesser of (i) one percent (1.0%) of the shares of common stock outstanding (on an as converted basis) on the last day of the immediately preceding fiscal year and (ii) such number of shares of common stock as determined by our board of directors; provided, however, that no more than 2,000,000 shares of our common stock may be issued under the 2015 Employee Stock Purchase Plan.

ITEM 13. *CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE*

The following is a description of transactions since January 1, 2016 to which we have been a party, in which the amount involved exceeds $120,000, and in which any of our directors, executive officers or holders of more than 5% of our capital stock, or an affiliate or immediate family member thereof, had or will have a direct or indirect material interest.

Indemnification Agreements and Directors' and Officers' Liability Insurance

We have entered into indemnification agreements with each of our directors and executive officers. These agreements, among other things, require us to indemnify each director and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys' fees, judgments, penalties fines and settlement amounts incurred by the director or executive officer in any action or proceeding, including any action or proceeding by or in right of us, arising out of the person's services as a director or executive officer.

Policies and Procedures for Related Party Transactions

Our board of directors has adopted a written related person transaction policy setting forth the policies and procedures for the review and approval or ratification of related person transactions. This policy covers, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships in which we were or are to be a participant, where the amount involved exceeds $120,000 and a related person had or will have a direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those

that could be obtained in an arm's length transaction with an unrelated third party and the extent of the related person's interest in the transaction.

Director Independence

Our board of directors currently consists of seven members. Our board of directors has determined that all of our directors, other than Dr. Paul Lammers, qualify as "independent" directors in accordance with the NASDAQ listing requirements. Dr. Lammers is not considered independent because he is an employee of Mirna. Clay B. Siegall Ph.D. is no longer a member of our board of directors; however, Dr. Siegall served on our board of directors during the 2016 fiscal year and until his resignation in December 2016. Our board of directors has determined that Dr. Siegall qualified as an "independent" director in accordance with NASDAQ listing requirements. The NASDAQ independence definition includes a series of objective tests, such as that the director is not, and has not been for at least three years, one of our employees and that neither the director nor any of his family members has engaged in various types of business dealings with us. In addition, as required by NASDAQ rules, our board of directors has made a subjective determination as to each independent director that no relationships exist, which, in the opinion of our board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In making these determinations, our board of directors reviewed and discussed information provided by the directors and us with regard to each director's business and personal activities and relationships as they may relate to us and our management. There are no family relationships among any of our directors or executive officers.

ITEM 14. ***PRINCIPAL ACCOUNTANT FEES AND SERVICES***

For the fiscal years ended December 31, 2016 and 2015, Ernst & Young LLP, or EY, billed the approximate fees set forth below. All fees included below were approved by the audit committee.

	Year Ended December 31,	
	2016	**2015**
Audit Fees[1]	$ 305,000	$ 634,206
Audit-Related Fees	—	—
Tax Fees	—	—
All Other Fees	—	—
Total All Fees	$ 305,000	$ 634,206

(1) Consists of fees billed for professional services rendered for the audit of our annual financial statements, quarterly interim reviews, and services provided in connection with our securities offerings and registration statements.

Pre-Approval Policies and Procedures

The audit committee has adopted a policy for the pre-approval of all audit and non-audit services to be performed for the Company by the independent registered public accounting firm. This policy is set forth in the charter of the audit committee and available at http://investor.mirnarx.com/corporate-governance.cfm. The audit committee approved all of the audit, audit-related, tax and other services provided by EY since our initial public offering in September 2015 and the estimated costs of those services. Actual amounts billed, to the extent in excess of the estimated amounts, are periodically reviewed and approved by the audit committee. The audit committee has considered the role of EY in providing audit and audit-related services to the Company and has concluded that such services are compatible with EY's role as the Company's independent registered public accounting firm.

PART IV

ITEM 15. *EXHIBITS and FINANCIAL STATEMENT SCHEDULES*

(a) The following documents are filed as part of this Annual Report on Form 10-K:

1. Financial Statements:

Reference is made to the Index to financial statements of Mirna Therapeutics, Inc. under Item 8 of Part II hereof.

2. Financial Statement Schedule:

All schedules are omitted because they are not applicable or the amounts are immaterial or the required information is presented in the financial statements and notes thereto in Part II, Item 8 above.

3. Exhibits

See Exhibit Index immediately following the signature page of this Form 10-K.

ITEM 16. FORM 10-K SUMMARY

Registrants may voluntarily include a summary of information required by Form 10-K under this Item 16. We have elected not to include such summary.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

MIRNA THERAPEUTICS, INC.
(Registrant)

Date: March 14, 2017

/s/ Paul Lammers

Paul Lammers, M.D., M.Sc.
Chief Executive Officer
(Principal Executive Officer)

Date: March 14, 2017

/s/ Alan Fuhrman

Alan Fuhrman
Chief Financial Officer
(Principal Financial and Accounting Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints each of Paul Lammers and Alan Fuhrman his or her true and lawful attorney-in-fact and agent, with full power of substitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this annual report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated opposite his/her name.

Pursuant to the requirements of the Securities Act, this report has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Paul Lammers Paul Lammers, M.D., M.Sc.	Director, President and Chief Executive Officer (Principal Executive Officer)	March 14, 2017
/s/ Alan Fuhrman Alan Fuhrman	Chief Financial Officer (Principal Financial and Accounting Officer)	March 14, 2017
/s/ Michael Powell Michael Powell, Ph.D.	Chairman of the Board	March 14, 2017
/s/ Lawrence M. Alleva Lawrence M. Alleva	Director	March 14, 2017
/s/ Edward Mathers Edward Mathers	Director	March 14, 2017
/s/ Matthew Winkler Matthew Winkler, Ph.D.	Director	March 14, 2017
/s/ Peter Greenleaf Peter Greenleaf	Director	March 14, 2017
/s/ Perry Nisen Perry Nisen, M.D., Ph.D.	Director	March 14, 2017

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Date Filed with the SEC	Exhibit Number	
3.1	Amended and Restated Certificate of Incorporation	8-K	001-37566	10/06/2015	3.1	
3.2	Amended and Restated Bylaws	8-K	001-37566	10/06/2015	3.2	
4.1	Reference is made to Exhibits 3.1 through 3.2.					
4.2	Form of Common Stock Certificate.	S-1/A	333-206544	09/18/2015	4.2	
10.1	Third Amended and Restated Investor Rights Agreement, dated as of March 31, 2015, by and among Mirna Therapeutics, Inc. and certain of its stockholders.	S-1/A	333-206544	09/11/2015	4.3	
10.2	Registration Rights Agreement, dated October 5, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.	8-K	001-37566	10/5/2015	4.1	
10.3(A)	Services Agreement, dated January 1, 2013, by and between Mirna Therapeutics, Inc. and Asuragen, Inc.	S-1/A	333-206544	08/24/2015	10.1(A)	
10.3(B)	Amendment No. 1 to the Services Agreement, dated October 31, 2014, by and between Mirna Therapeutics, Inc. and Asuragen, Inc.	S-1/A	333-206544	08/24/2015	10.1(B)	
10.4(A)†	Cross License Agreement, dated November 3, 2009, by and between Mirna Therapeutics, Inc. and Asuragen, Inc.	S-1/A	333-206544	08/24/2015	10.2(A)	
10.4(B)†	First Amendment to the Cross License Agreement, dated September 28, 2012, by and between Mirna Therapeutics, Inc. and Asuragen, Inc.	S-1/A	333-206544	08/24/2015	10.2(B)	
10.5(A)†	License Agreement, dated December 22, 2011, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	09/11/2015	10.3(A)	
10.5(B)†	Side Letter to License Agreement, dated December 22, 2011, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	08/24/2015	10.3(B)	
10.5(C)†	Side Letter to License Agreement, dated November 16, 2012, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	08/24/2015	10.3(C)	
10.5(D)†	Amendment No. 1 to License Agreement, dated December 27, 2013, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	09/18/2015	10.3(D)	
10.5(E)†	Side Letter to License Agreement, dated January 9, 2014, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	09/30/2015	10.3(E)	
10.5(F)	Amendment No. 2 to License Agreement, dated May 11, 2015, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	09/18/2015	10.3(F)	
10.5(G)†	Side Letter to License Agreement, dated August 24, 2015, by and between Mirna Therapeutics, Inc. and Marina Biotech, Inc.	S-1/A	333-206544	09/11/2015	10.3(G)	
10.6†	Amended and Restated Agreement, dated February 6, 2014, by and between Mirna Therapeutics, Inc. and Yale University.	S-1/A	333-206544	09/11/2015	10.4	
10.7†	License Agreement, dated March 10, 2013, by and between Mirna Therapeutics, Inc. and University of Zurich.	S-1/A	333-206544	09/11/2015	10.5	
10.8†	Supply Agreement for a Liposomal Formulation, dated November 18, 2012, by and between Mirna Therapeutics, Inc. and Polymun Scientific Immunbiologische Forschung GmbH.	S-1/A	333-206544	08/24/2015	10.7	
10.9	Lease Agreement, dated as of June 24, 2016, between G&I VII Encino Trace II LP and Mirna Therapeutics, Inc.	10-Q	001-37566	08/15/2016	10.1	

10.10†	Cancer Research Grant Contract, dated August 31, 2010, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.	S-1/A	333-206544	08/24/2015	10.6	
10.11	Cancer Research Grant Contract, dated September 1, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.	S-1/A	333-206544	09/11/2015	10.19	
10.12	Stock Purchase Agreement, dated September 1, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.	S-1/A	333-206544	09/11/2015	10.15	
10.13†	Patent License Agreement, dated December 31, 2015, by and between Rosetta Genomics Ltd. and Mirna Therapeutics, Inc.	10-K	001-37566	03/29/2016	10.13	
10.14(A)#	2008 Long Term Incentive Plan, as amended.	S-1/A	333-206544	08/24/2015	10.8(A)	
10.14(B)#	Form of Notice of Stock Option Grant under 2008 Long Term Incentive Plan.	S-1/A	333-206544	08/24/2015	10.8(B)	
10.14(C)#	Form of Stock Option Agreement under 2008 Long Term Incentive Plan.	S-1/A	333-206544	08/24/2015	10.8(C)	
10.15(A)#	2015 Equity Incentive Award Plan.	S-1/A	333-206544	09/18/2015	10.9(A)	
10.15(B)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2015 Equity Incentive Award Plan.	S-1/A	333-206544	09/11/2015	10.9(B)	
10.15(C)#	Form of Restricted Stock Award Agreement and Restricted Stock Unit Award Grant Notice under the 2015 Equity Incentive Award Plan.	S-1/A	333-206544	09/11/2015	10.9(B)	
10.16#	2015 Employee Stock Purchase Plan.	S-1/A	333-206544	09/18/2015	10.10	
10.17#	Non-Employee Director Compensation Program.	S-1/A	333-206544	09/18/2015	10.11	
10.18#	Form of Change in Control Severance Agreement.	S-1/A	333-206544	09/11/2015	10.12	
10.19#	Form of Indemnification Agreement.	S-1/A	333-206544	09/11/2015	10.13	
10.20(A)#	Employment Agreement, dated November 4, 2009, by and between Mirna Therapeutics, Inc. and Paul Lammers, M.D., M.Sc.	S-1/A	333-206544	09/11/2015	10.16(A)	
10.20(B)#	First Amendment to Employment Agreement, dated January 5, 2011, by and between Mirna Therapeutics, Inc. and Paul Lammers, M.D., M.Sc.	S-1/A	333-206544	09/11/2015	10.16(B)	
10.21(A)#	Offer Letter, dated April 29, 2013, by and between Mirna Therapeutics, Inc. and Sinil Kim, M.D.	S-1/A	333-206544	09/11/2015	10.17(A)	
10.21(B)#	Employment Agreement, dated May 22, 2013, by and between Mirna Therapeutics, Inc. and Sinil Kim, M.D.	S-1/A	333-206544	09/11/2015	10.17(B)	
10.21(C)#	Transition and Separation Agreement, dated as of May 13, 2016, by and between Sinil Kim and Mirna Therapeutics, Inc.	10-Q	001-37566	08/15/2016	10.3	
10.22#	Employment Agreement, dated March 1, 2014, by and between Mirna Therapeutics, Inc. and Casi DeYoung.	S-1/A	333-206544	09/11/2015	10.18	
10.23(A)#	Offer Letter, dated August 31, 2015, by and between Mirna Therapeutics, Inc. and Alan Fuhrman.	S-1/A	333-206544	09/18/2015	10.20(A)	
10.23(B)#	Employment Agreement, dated September 8, 2015, by and between Mirna Therapeutics, Inc. and Alan Fuhrman.	S-1/A	333-206544	09/18/2015	10.20(B)	
10.24(A)#	Employment Agreement, dated April 18, 2013, by and between Mirna Therapeutics, Inc. and Jon Irvin.	S-1/A	333-206544	09/18/2015	10.21(A)	
10.24(B)#	Amendment No. 1 to the Employment Agreement, dated August 1, 2014, by and between Mirna Therapeutics, Inc. and Jon Irvin.	S-1/A	333-206544	09/18/2015	10.21(B)	
10.24(C)#	Separation Agreement dated December 2, 2016 by and between Jon Irvin and Mirna Therapeutics, Inc.					X
10.25(A)#	Offer Letter, dated September 17, 2015, by and between Mirna Therapeutics, Inc. and Miguel Barbosa, Ph.D.	S-1/A	333-206544	09/18/2015	10.22	

10.25(B)#	Employment Agreement, dated September 23, 2015, by and between Mirna Therapeutics, Inc. and Miguel Barbosa, Ph.D.	S-1/A	333-206544	09/25/2015	10.22(B)	
10.25(C)#	Separation Agreement dated June 29, 2016 by and between Miguel Barbosa and Mirna Therapeutics, Inc.	10-Q	001-37566	08/15/2016	10.2	
10.26(A)#	Offer Letter, dated March 31, 2016, by and between Mirna Therapeutics, Inc. and Vincent O'Neill.					X
10.26(B)#	Employment Agreement, dated April 27, 2016 by and between Mirna Therapeutics, Inc. and Vincent O'Neill.					X
23.1	Consent of independent registered public accounting firm.					X
24.1	Power of Attorney (included on the signature page hereto).					X
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.					X
32.1**	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.					X
101.INS	XBRL Instance Document					X
101.SCH	XBRL Taxonomy Extension Schema Document					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.					X

† Confidential treatment has been granted for certain information contained in this exhibit. Such information has been omitted and filed separately with the Securities and Exchange Commission.

# Indicates management contract or compensatory plan.

** The certification attached as Exhibit 32.1 that accompanies this Form 10-K is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Mirna Therapeutics, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Form 10-K, irrespective of any general incorporation language contained in such filing.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-207299 and 333-210466) pertaining to the 2008 Long Term Incentive Plan, 2015 Equity Incentive Plan and 2015 Employee Stock Purchase Plan of Mirna Therapeutics, Inc. of our report dated March 14, 2017, with respect to the financial statements of Mirna Therapeutics, Inc., included in this Annual Report (Form 10-K) for the year ended December 31, 2016, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Austin, Texas
March 14, 2017

Exhibit 10.24(C)

SEPARATION AGREEMENT

This Separation Agreement (the "Agreement") by and between Jon Irvin ("Executive") and Mirna Therapeutics, Inc., a Delaware corporation (the "Company"), is made effective eight (8) days after Executive's signature hereto (the "Effective Date"), unless Executive revokes his acceptance of this Agreement as provided in Section 5(c) below, with reference to the following facts:

A. Executive's employment with the Company and status as a Vice President and employee of the Company and each of its affiliates will end effective upon the Separation Date (as defined below).

B. Executive and the Company want to end their relationship amicably and also to establish the obligations of the parties including, without limitation, all amounts due and owing to Executive.

C. The payments and benefits being made available to Executive pursuant to this Agreement are intended to satisfy all outstanding obligations under that certain Change in Control Severance by between Executive and the Company (the "Severance Agreement").

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth, the parties agree as follows:

1. Separation Date. Executive acknowledges and agrees that his status as an Vice President and employee of the Company will end effective as of December 2, 2016 (the "Separation Date"). Executive hereby agrees to execute such further document(s) as shall be determined by the Company as necessary or desirable to give effect to the end of Executive's status as an officer of the Company and, if applicable, officer and/or director of any of its subsidiaries; provided that such documents shall not be inconsistent with any of the terms of this Agreement.

2. Final Paycheck; Payment of Accrued Wages and Expenses.

(a) *Final Paycheck*. As soon as administratively practicable on or after the Separation Date, the Company will pay Executive all accrued but unpaid base salary and all accrued and unused vacation earned through the Separation Date, subject to standard payroll deductions and withholdings. Executive is entitled to these payments regardless of whether Executive executes this Agreement.

(b) *Business Expenses*. The Company shall reimburse Executive for all outstanding expenses incurred prior to the Separation Date which are consistent with the Company's policies in effect from time to time with respect to travel, entertainment and other business expenses, subject to the Company's requirements with respect to reporting and documenting such expenses, including, without limitation, expenses incurred pursuant to Executive's services to the Company.

(c) *Stock Options*. As of the Separation Date, Executive will hold vested options to purchase 39,749 shares of Company common stock ("Vested Options") and unvested options to purchase 41,968 shares of Company common stock ("Unvested Options") pursuant to the Company's equity incentive plans and the option agreements evidencing such grants. Upon the Separation Date, Executive's Unvested Options shall vest. Executive shall have until

the three month anniversary of the Separation Date to exercise Executive's Vested Options. Any Vested Options unexercised as of the three month anniversary of the Separation Date shall automatically terminate.

3. Separation Payments and Benefits. Without admission of any liability, fact or claim, the Company hereby agrees, subject to this Agreement becoming effective and irrevocable, as well as Executive's performance of his continuing obligations pursuant to this Agreement and that certain Confidentiality, Covenant Not To Compete & Arbitration Agreement by and between the Company and Executive dated April 18, 2013 (the "Confidentiality Agreement") (including, without limitation, the non-competition and non-solicitation restrictive covenants set forth therein for the periods set forth in the Confidentiality Agreement), to provide Executive the severance benefits set forth below. Specifically, the Company and Executive agree as follows:

(a) *Severance*. The Company shall pay to Executive $315,900, which represents twelve (12) months of Executive's base salary ($243,000) at the rate in effect as of immediately prior to the Separation Date, in a single cash lump sum. The Company shall also pay to Executive 100% ($72,900) of their annual target bonus in a single cash lump sum. Such payments shall be made, less applicable withholdings and deductions, on or as soon as reasonably practicable following the first regularly scheduled payroll date in January 2017.

(b) *Healthcare Continuation Coverage.* If Executive elects to receive continued healthcare coverage pursuant to the provisions of the Consolidated Omnibus Budget Reconciliation Act of *1985,* as amended ("COBRA"), the Company shall directly pay, or reimburse Executive for, that portion of the premium for Executive and Executive's covered dependents necessary such that Executive contributes the same amount to COBRA coverage as Executive contributed to medical, dental and vision coverage prior to the date of this Agreement, such payment or reimbursement to continue until the earlier of (i) the last day of the month during which the twelve (12) month anniversary of the Separation Date falls or (ii) the date Executive becomes eligible for comparable coverage under another employer's plans. After the Company ceases to pay premiums pursuant to the preceding sentence, Executive may, if eligible, elect to continue healthcare coverage at Executive's expense in accordance with the provisions of COBRA. Executive acknowledges that he shall be solely responsible for all matters relating to Executive's continuation of coverage pursuant to COBRA, including, without limitation, Executive's election of such coverage and his timely payment of premiums.

(c) *Taxes*. Executive understands and agrees that all payments under this Section 3 will be subject to appropriate tax withholding and other deductions. To the extent any taxes may be payable by Executive for the benefits provided to him by this Section 3 beyond those withheld by the Company, Executive agrees to pay them himself and to indemnify and hold the Company and the other entities released herein harmless for any tax claims or penalties, and associated attorneys' fees and costs, resulting from any failure by him to make required payments. To the extent that any reimbursements payable pursuant to this Agreement are subject to the provisions of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), such reimbursements shall be paid to Executive no later than December 31 of the year following the year in which the expense was incurred, the amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year, and Executive's right to reimbursement under this Agreement will not be subject to liquidation or exchange for another benefit.

(d) *SEC Reporting*. Executive acknowledges that to the extent required by the Securities Exchange Act of 1934, as amended (the "Exchange Act"), he will have continuing obligations under Section 16(a) and 16(b) of the Exchange Act to report Executive's matching transactions in Company common stock for six (6) months following the Separation Date. Executive hereby agrees not to undertake, directly or indirectly, any reportable transactions involving the common stock of the Company until the end of such six (6) month period.

(e) *Sole Separation Benefit*. Executive agrees that the payments provided by this Section 3 are not required under the Company's normal policies and procedures and are provided as a severance solely in connection with this Agreement. Executive acknowledges and agrees that the payments referenced in this Section 3 constitute adequate and valuable consideration, in and of themselves, for the promises contained in this Agreement.

4. Full Payment. Executive acknowledges that the payment and arrangements herein shall constitute full and complete satisfaction of any and all amounts properly due and owing to Executive as a result of his employment with the Company and the termination thereof. Executive further acknowledges that, other than the Equity Award agreements, the Confidentiality Agreement and the Indemnification Agreement between Executive and the Company (the "Indemnification Agreement"), this Agreement shall supersede each agreement entered into between Executive and the Company regarding Executive's employment, including, without limitation, any offer letter, the Severance Agreement and that certain employment agreement by and between Executive and the Company dated April 18, 2013, and each such agreement shall be deemed terminated and of no further effect as of the Separation Date.

5. Executive's Release of the Company. Executive understands that by agreeing to the release provided by this Section 5, Executive is agreeing not to sue, or otherwise file any claim against, the Company or any of its employees or other agents for any reason whatsoever based on anything that has occurred as of the date Executive signs this Agreement.

(a) On behalf of Executive and Executive's heirs, assigns, executors, administrators, trusts, spouse and estate, Executive hereby releases and forever discharges the "Releasees" hereunder, consisting of the Company, and each of its owners, affiliates, subsidiaries, predecessors, successors, assigns, agents, directors, officers, partners, employees, and insurers, and all persons acting by, through, under or in concert with them, or any of them, of and from any and all manner of action or actions, cause or causes of action, in law or in equity, suits, debts, liens, contracts, agreements, promises, liability, claims, demands, damages, loss, cost or expense, of any nature whatsoever, known or unknown, fixed or contingent (hereinafter called "Claims"), which Executive now has or may hereafter have against the Releasees, or any of them, by reason of any matter, cause, or thing whatsoever from the beginning of time to the date hereof, including, without limiting the generality of the foregoing, any Claims arising out of, based upon, or relating to Executive's hire, employment, remuneration or resignation by the Releasees, or any of them, Claims arising under federal, state, or local laws relating to employment, Claims of any kind that may be brought in any court or administrative agency, including any Claims arising under the Age Discrimination in Employment Act ("ADEA"), 29 U.S.C. § 621, et seq.; Title VII of the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1991, 42 U.S.C. § 2000 et seq.; the Equal Pay Act, 29 U.S.C. § 206(d); the Civil Rights Act of 1866, 42 U.S.C. § 1981; the Family and Medical Leave Act of 1993, 29 U.S.C. § 2601 et seq.; the Americans with Disabilities Act of 1990, 42 U.S.C. § 12101 et seq.;

the False Claims Act , 31 U.S.C. § 3729 et seq.; the Employee Retirement Income Security Act, 29 U.S.C. § 1001 et seq.; the Worker Adjustment and Retraining Notification Act, 29 U.S.C. § 2101 et seq. the Fair Labor Standards Act, 29 U.S.C. § 215 et seq., the Sarbanes-Oxley Act of 2002; the Texas Labor Code, including the Texas Commission on Human Rights Act; Section 451.001 of the Texas Workers' Compensation Act; the Texas Payday Act; and the Texas Labor Code; Claims for breach of contract; Claims arising in tort, including, without limitation, Claims of wrongful dismissal or discharge, discrimination, harassment, retaliation, fraud, misrepresentation, defamation, libel, infliction of emotional distress, violation of public policy, and/or breach of the implied covenant of good faith and fair dealing; and Claims for damages or other remedies of any sort, including, without limitation, compensatory damages, punitive damages, injunctive relief and attorney's fees.

(b) Notwithstanding the generality of the foregoing, Executive does not release the following claims:

(i) Claims for unemployment compensation or any state disability insurance benefits pursuant to the terms of applicable state law;

(ii) Claims for workers' compensation insurance benefits under the terms of any worker's compensation insurance policy or fund of the Company;

(iii) Claims to continued participation in certain of the Company's group benefit plans pursuant to the terms and conditions of COBRA;

(iv) Claims to any benefit entitlements vested as the date of Executive's employment termination, pursuant to written terms of any Company employee benefit plan;

(v) Claims for indemnification under the Indemnification Agreement, the Company's Bylaws or any applicable law; and

(vi) Executive's right to bring to the attention of the Equal Employment Opportunity Commission claims of discrimination; provided, however, that Executive does release Executive's right to secure any damages for alleged discriminatory treatment.

(c) In accordance with the Older Workers Benefit Protection Act of 1990, Executive has been advised of the following: Executive acknowledges that Executive is knowingly and voluntarily waiving and releasing any rights Executive may have under the ADEA. Executive also acknowledges that the consideration given for the waiver and release herein is in addition to anything of value to which Executive was already entitled. Executive further acknowledges that Executive has been advised by this writing, as required by the ADEA, that: (i) Executive's waiver and release do not apply to any rights or claims that may arise after the execution date of this Agreement; (ii) Executive has been advised hereby that Executive has the right to consult with an attorney prior to executing this Agreement; (iii) Executive has twenty-one (21) days from the date of this Agreement to execute this Agreement (although Executive may choose to voluntarily execute this Agreement earlier); (iv) Executive has seven (7) days following the execution of this Agreement by Executive to revoke the Agreement, and Executive will not receive the severance benefits provided by Section 3 of this Agreement unless and until such seven (7) day period has expired; (v) this Agreement will not be effective until the date

upon which the revocation period has expired, which will be the eighth (8th) day after this Agreement is executed by Executive, *provided* that the Company has also executed this Agreement by that date; and (vi) this Agreement does not affect Executive's ability to test the knowing and voluntary nature of this Agreement. If Executive wishes to revoke this Agreement, Executive must deliver notice of Executive's revocation in writing, no later than 5:00 p.m. Central Time on the 7th day following Executive's execution of this Agreement to Alan Fuhrman, PO Box 163387, Austin, Texas, 78716, or e-mail afuhrman@mirnarx.com.

6. Non-Disparagement, Transition, Transfer of Company Property and Limitations on Service. Both parties further agree that:

(a) *Non-Disparagement*. Both parties agree that they shall not disparage, criticize or defame the other party and their respective directors, officers, agents, partners, stockholders, employees, products, services, technology or business, either publicly or privately. Nothing in this Section 6(a) shall have application to any evidence or testimony required by any court, arbitrator or government agency.

(b) *Transition*. Each of the Company and Executive shall use their respective reasonable efforts to cooperate with each other in good faith to facilitate a smooth transition of Executive's duties to other executive(s) of the Company.

(c) *Transfer of Company Property*. On or before the Separation Date, Executive shall turn over to the Company all files, memoranda, records, and other documents, and any other physical or personal property which are the property of the Company and which he had in his possession, custody or control at the time he signed this Agreement.

7. Executive Representations. Executive warrants and represents that (a) he has not filed or authorized the filing of any complaints, charges or lawsuits against the Company or any affiliate of the Company with any governmental agency or court, and that if, unbeknownst to Executive, such a complaint, charge or lawsuit has been filed on his behalf, he will immediately cause it to be withdrawn and dismissed, (b) he has reported all hours worked as of the date of this Agreement and has been paid all compensation, wages, bonuses, commissions, and/or benefits to which he may be entitled and no other compensation, wages, bonuses, commissions and/or benefits are due to him, except as provided in this Agreement, (c) he has no known workplace injuries or occupational diseases and has been provided and/or has not been denied any leave requested under the Family and Medical Leave Act or any similar state law, (d) the execution, delivery and performance of this Agreement by Executive does not and will not conflict with, breach, violate or cause a default under any agreement, contract or instrument to which Executive is a party or any judgment, order or decree to which Executive is subject, and (e) upon the execution and delivery of this Agreement by the Company and Executive, this Agreement will be a valid and binding obligation of Executive, enforceable in accordance with its terms.

8. No Assignment by Executive. Executive warrants and represents that no portion of any of the matters released herein, and no portion of any recovery or settlement to which Executive might be entitled, has been assigned or transferred to another person, firm or corporation not a party to this Agreement, in any manner, including by way of subrogation or operation of law or otherwise. If any claim, action, demand or suit should be made or instituted against the Company or any other Releasee because of any actual assignment, subrogation or transfer by Executive, Executive agrees to indemnify and hold harmless the Company and all other Releasees against such claim, action, suit or demand, including necessary expenses of investigation, attorneys' fees and costs. In the event of

Executive's death, this Agreement shall inure to the benefit of Executive and Executive's executors, administrators, heirs, distributees, devisees, and legatees. None of Executive's rights or obligations may be assigned or transferred by Executive, other than Executive's rights to payments hereunder, which may be transferred only upon Executive's death by will or operation of law.

9. Governing Law. This Agreement shall be construed and enforced in accordance with, and the rights of the parties shall be governed by, the laws of the State of Texas or, where applicable, United States federal law, in each case, without regard to any conflicts of laws provisions or those of any state other than Texas.

10. Miscellaneous. This Agreement, collectively with the Confidentiality Agreement, the Indemnification Agreement and the Equity Award agreements, comprise the entire agreement between the parties with regard to the subject matter hereof and supersedes, in their entirety, any other agreements between Executive and the Company with regard to the subject matter hereof. The Company and Executive acknowledge that the separation of the Executive's employment with the Company is intended to constitute an involuntary separation from service for the purposes of Section 409A of the Code, and the related Department of Treasury regulations. Executive acknowledges that there are no other agreements, written, oral or implied, and that he may not rely on any prior negotiations, discussions, representations or agreements. This Agreement may be modified only in writing, and such writing must be signed by both parties and recited that it is intended to modify this Agreement. This Agreement may be executed in separate counterparts, each of which is deemed to be an original and all of which taken together constitute one and the same agreement.

11. Company Assignment and Successors. The Company shall assign its rights and obligations under this Agreement to any successor to all or substantially all of the business or the assets of the Company (by merger or otherwise). This Agreement shall be binding upon and inure to the benefit of the Company and its successors, assigns, personnel and legal representatives.

12. Maintaining Confidential Information. Executive reaffirms his obligations under the Confidentiality Agreement. Executive acknowledges and agrees that the payments provided in Section 3 above shall be subject to Executive's continued compliance with Executive's obligations under the Confidentiality Agreement.

13. Executive's Cooperation. After the Separation Date, Executive shall cooperate with the Company and its affiliates, upon the Company's reasonable request, with respect to any internal investigation or administrative, regulatory or judicial proceeding involving matters within the scope of Executive's duties and responsibilities to the Company or its affiliates during his employment with the Company (including, without limitation, Executive being available to the Company upon reasonable notice for interviews and factual investigations, appearing at the Company's reasonable request to give testimony without requiring service of a subpoena or other legal process, and turning over to the Company all relevant Company documents which are or may have come into Executive's possession during his employment); *provided*, *however*, that any such request by the Company shall not be unduly burdensome or interfere with Executive's personal schedule or ability to engage in gainful employment.

(Signature page(s) follow)

IN WITNESS WHEREOF, the undersigned have caused this Separation Agreement to be duly executed and delivered as of the date indicated next to their respective signatures below.

DATED: December 2, 2016

/s/ Jon Irvin
Jon Irvin
MIRNA THERAPEUTICS, INC.

DATED: December 2, 2016

By: /s/ Paul Lammers
Paul Lammers, M.D., MSc.
President and CEO

Exhibit 10.26(A)

[MIRNA THERAPEUTICS LETTERHEAD]

March 31, 2016

Vincent J. O'Neill, M.D.
[Address]

Dear Vince:

On behalf of Mirna Therapeutics, Inc. (“Mirna"), a Delaware corporation, I am pleased to offer you the full-time position of Chief Medical Officer. We anticipate your start date to be April 25, 2016 (the “Start Date”).

Prior to your Start Date, you will be required to sign an Employment Agreement and a Confidentiality, Covenant Not To Compete, & Arbitration Agreement with Mirna.

Your base salary will be $13,076.92 per two week pay period. You will be entitled to earn an annual bonus in the amount of up to 35% of your base salary upon your achievement of annual performance targets as determined by Mirna’s Board of Directors, as further described in the Employment Agreement.

You will receive a signing bonus of $60,000 on the first payroll date following your Start Date. Should you terminate your employment prior to one year from your Start Date, you will be required to reimburse Mirna for the amount of your signing bonus; for the avoidance of doubt, you may keep the signing bonus in the event that you are terminated by Mirna without cause. Your signature on this letter authorizes us to deduct the amount of your signing bonus from your final paycheck should this occur. If there are any amounts not covered by your final paycheck you agree to repay them within 30 days of your separation.

Subject to approval by Mirna’s Board of Directors, and as further described in the Employment Agreement, we anticipate granting you an option to purchase common stock representing 250,000 shares of common stock, which represents approximately 1.2% of the outstanding shares of the Company’s common stock, at an exercise price equal to the closing price as reported on NASDAQ on the grant date, which will be your Start Date.

Mirna offers group insurance and time off benefits for which you are eligible for beginning on June 1, 2016. You may choose insurance plans such as medical, dental, vision and supplemental life insurance (which is in addition to the amount Mirna provides for you). Mirna pays 100% of the premiums for short and long-term disability, basic life, accidental death and dismemberment, and an employee assistance program.

As of your Start Date, you will receive 15 days of vacation for your first year of employment, 7 days of sick time per calendar year and a total of 12 holidays (8 fixed date holidays and 4 flexible date or “flex" holidays) per calendar year. Vacation, sick time and the flex holidays will be prorated if your start date is after January 1.

Once you have 90 days of continuous service at Mirna, you are eligible to participate in Mirna’s 401 (k) Plan. The 401 (k) Plan has a matching component that is presently 50 cents per dollar up to 8% of your base compensation. The Board of Directors reserves the right to modify this matching percentage.

We expect you to relocate to Austin within three months of your Start Date. As further described in the Employment Agreement, Mirna will reimburse you for reasonable and necessary documented relocation and moving expenses up to $25,000.

Your position is an "at will" position, which is the customary employment relationship in "at will" employment states such as Texas. This simply means that the employment relationship between Mirna and you is based upon mutual consent and can be terminated at any time by either you or Mirna without advance notice and without any requirement for cause. It also means that your job duties, title and responsibility and reporting level, work schedule, compensation and benefits, as well as the Company's personnel policies and procedures, may be changed with prospective effect, with or without notice, at any time in the sole discretion of the Company. This "at-will" nature of your employment shall remain unchanged during your tenure as an employee and may not be changed, except in an express writing signed by you and a duly authorized member of the Company. If your employment terminates for any reason, you shall not be entitled to any payments, benefits, damages, awards or compensation other than as provided by your offer letter, Employment Agreement, and Confidentiality, Covenant Not To Compete, & Arbitration Agreement. Your position is not governed by any other agreements, and you are not employed for any specific period of time. No employee of Mirna has the authority to enter into any other agreement with you concerning your employment.

With the legal disclaimers out of the way, I am excited about your joining our Company and know that you can play a significant role in its continued growth. Please do not hesitate to call me or Jon Irvin if you have any questions. Please sign and return a copy of this letter by **April 7, 2016** acknowledging your acceptance of this offer. You may send a scanned copy of this letter to [email address] or fax a copy to our confidential facsimile at (512) 681-5201.

Sincerely,

/s/ Paul Lammers

Dr. Paul Lammers
President and CEO

Accepted by:

/s/ Vince O'Neill

Signature/Date: 3/31/2016

Exhibit 10.26(B)

[MIRNA THERAPEUTICS LETTERHEAD]

This EMPLOYMENT AGREEMENT (the "**Agreement**") is made and entered into this 25th day of April, 2016 (the "**Effective Date**") by and between Mirna Therapeutics, Inc., a Delaware corporation (the "**Company**") and Vincent J. O'Neill, M.D. ("**Employee**").

WITNESSETH

WHEREAS, the Company desires to employ Employee as its Chief Medical Officer on the terms and subject to the conditions set forth herein, and Employee desires to accept such employment;

NOW, THEREFORE, in consideration of the mutual covenants, promises and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. **Employment.**

    a. The Company hereby employs Employee and Employee hereby accepts employment as the Chief Medical Officer of the Company, subject to the direction of the Chief Executive Officer of the Company. Employee agrees that he shall perform and discharge well and faithfully the duties and responsibilities that are assigned to him by the Chief Executive Officer of the Company from time to time, which shall include, but are not limited to, designing and implementing the Company's clinical programs, working with the Board of Directors of the Company (the "**Board**"), management, and Scientific Advisory Board to establish a clinical development strategy, communicating with the medical, regulatory, investor and customer communities concerning the Company's capabilities and therapeutic offerings, assuring delivery of quality medical care by the Company and its representatives, and facilitating interactions between medical staff and the Company in connection with the development of the Company's therapeutic offerings. Employee recognizes that he owes a duty of loyalty to the Company and agrees to act only in the best interests of the Company and to devote such of his time, attention and energy to the business of the Company, and any of its subsidiaries or affiliates as may be required to perform the duties and responsibilities assigned to him by the Chief Executive Officer of the Company, to the best of his ability and with requisite diligence.

    b. Employee agrees to comply in all material respects, at all times during the Term (as defined in Section 2 below), with all applicable policies, rules and regulations of the Company, including but not limited to the Company's Insider Trading Policy and Code of Business Conduct and Ethics.

2. **Term.** This Agreement shall commence on the Effective Date and, unless earlier terminated as provided herein, shall automatically renew for successive one-year periods on the anniversary of the Effective Date (the "**Term**").

3. **Compensation.**

a. The Company shall pay to Employee a yearly annual salary of $340,000 (the "**Base Salary**"), less all applicable withholdings, which shall be paid pursuant to the Company's payroll procedures as may exist from time to time. The Base Salary may be increased at the discretion of the Board.

b. The Company shall pay to Employee a signing bonus in the amount of $60,000 (the "**Signing Bonus**"), to be paid on the first payroll date following the Effective Date. Notwithstanding the foregoing, Employee and the Company acknowledge and agree that the Signing Bonus will not be earned to any extent prior to the first anniversary of the Effective Date and will only be earned on the first anniversary of the date Employee commences employment with the Company if Employee remains actively employed by the Company through such anniversary, unless Employee is earlier terminated by the Company without Cause (as defined below). In the event that Employee resigns his employment with the Company on or prior to the first anniversary of the Effective Date, then Employee hereby agrees to repay in full to the Company the Signing Bonus, which such repayment shall occur no later than thirty (30) days after the date of Employee's resignation of employment with the Company. Employee hereby authorizes the Company to immediately offset against and reduce any amounts otherwise due to him for any amounts in respect of the obligation to repay the Signing Bonus. As used herein, "**Cause**" means the occurrence of any of the following events, as determined by the Board or a committee designated by the Board, in its sole discretion: (A) the conviction of Employee by a court of competent jurisdiction of a crime involving moral turpitude; (B) the commission, or attempted commission, by Employee of an act of fraud on the Company; (C) the misappropriation, or attempted misappropriation, by Employee of any of the Company's funds or property; (D) the failure by Employee to perform in any material respect his obligations under the terms of this Agreement, which such failure has gone unremedied within twenty (20) days after the Company provides Employee with written notice of such failure; (E) the knowing engagement by Employee, without written approval of the Board, in any activity which competes with the Company's business or which would result in a material injury to the Company or which otherwise violates any provision of this Agreement or any confidentiality agreement; or (F) the knowing engagement by Employee in any activity that would constitute a material violation of the provisions of the Company's business ethics policy, employee handbook or similar policies, if any, then in effect.

c. During each fiscal year of the Term, Employee will be entitled to earn an annual bonus in the amount of up to 35% of Employee's Base Salary upon the achievement of annual performance targets set by the Board (the "**Target Bonus**"). Employee's annual performance targets will be established annually by the Board, or Compensation Committee of the Board, in its sole discretion. For the current fiscal year in which the Effective Date occurs, any Target Bonus earned will be prorated based upon the number of days elapsed in the current fiscal year. In order to comply with the requirements of Section 409A of the Internal Revenue Code of 1986, as amended ("**Section 409A**"), it is agreed that the Target Bonus (if any) shall be paid no later than March 15th of the calendar year immediately following the calendar year in which the fiscal year to which such Target Bonus relates ended.

d. Subject to the approval of the Board, the Company shall grant Employee an option to purchase up to 250,000 shares of common stock of the Company, which represents approximately 1.2% of the outstanding shares of common stock of the Company, at an exercise price equal to the closing price as reported on NASDAQ on the Effective Date. Vesting of such option will begin as of the Effective Date. Subject to the approval of the Board, provided that Employee continues to provide services to the Company through each vesting date, the option shall vest and become exercisable with respect to ¼ of the shares on the first anniversary of the Effective Date, and 1/48 of the shares on each monthly anniversary of the Effective Date thereafter, so that the option shall be exercisable with respect to 100% of the shares as of the four year anniversary of the vesting commencement date. The option will otherwise be subject to the Company's equity incentive plan and an option agreement between the Company and Employee.

4. Fringe Benefits; Expenses.

a. Employee shall be eligible to participate in benefit plans and programs in which other similarly situated employees are eligible to participate and as may exist from time to time, such as medical, dental, vision, and supplemental life insurance. Employee's participation in any benefit plan or program is subject to the terms and conditions of the applicable plan and program.

b. The Company agrees to reimburse Employee for all reasonable, out-of-pocket expenses incurred by him in the performance of his duties, subject to the submission of appropriate documentation in accordance with the Company's expense reimbursement policies as in existence from time to time. Employee is not permitted to receive a payment or benefit in lieu of reimbursement under this Section 4(b).

c. Employee shall relocate his primary residence from the Cambridge, Massachusetts area to the Austin, Texas area during the first three months of the Term ("**Relocation Period**"). The Company shall reimburse Employee for reasonable and necessary documented relocation and moving expenses incurred during the Relocation Period (the "**Relocation Expenses**"). Such reimbursement shall be dependent upon Employee's submission, within thirty (30) days after such expenses are incurred, of documentation reasonably acceptable to the Company that evidences such expenses. Reimbursement of the Relocation Expenses, if any, shall be made no later than forty-five (45) days after the Company's receipt of approved documentation. In no event shall the Company reimburse Employee for Relocation Expenses in excess of $25,000. Notwithstanding the foregoing, Employee and the Company acknowledge and agree that the Relocation Expenses will not be earned to any extent prior to the first anniversary of the Effective Date and will only be earned on the first anniversary of the date Employee commences employment with the Company if Employee remains actively employed by the Company through such anniversary. In the event that Employee resigns his employment with the Company on or prior to the first anniversary of the Effective Date, then Employee hereby agrees to repay in full to the Company all Relocation Expenses for which he has been reimbursed, which such repayment shall occur no later than thirty (30) days after the date of Employee's resignation of employment with the Company. Employee hereby authorizes the Company to immediately offset

against and reduce any amounts otherwise due to him for any amounts in respect of the obligation to repay the Relocation Expenses.

5. **Confidentiality, Covenant Not To Compete and Arbitration.** Employee has executed and agrees to comply with the Confidentiality, Covenant Not To Compete & Arbitration Agreement, attached hereto as Exhibit A, which is incorporated herein by reference.

6. **Termination.** This Agreement and Employee's employment may be terminated in any one of the following ways:

   a. At any time during the Term, the Company may, at its sole discretion, terminate Employee's employment, with or without Cause. Such termination shall be effective on delivery of written notice to Employee of the Company's election to terminate this Agreement under this Section 6. Employee shall be entitled to receive all compensation earned and all benefits and reimbursements due through the effective date of termination. Employee shall not be entitled to any additional compensation subsequent to termination.

   b. This Agreement shall terminate automatically upon the death or Disability of Employee. A "**Disability**" is defined as Employee's inability to perform the essential functions of his position, with reasonable accommodation, due to Employee's illness or physical or mental impairment or other incapacity which continues for a period in excess of one hundred twenty (120) days (whether consecutive or not). The determination of Disability shall be made by the Board. If requested by the Company, Employee shall submit to a mental or physical examination to be performed by an independent physician selected by the Company following consultation with Employee to assist the Company in making such determination. Any refusal by Employee to submit to a mental or physical examination under this section, or to provide medical documentation necessary for the Company to make its determination, shall be deemed to constitute conclusive evidence of Employee's Disability. Employee (or his estate or representative, if applicable) shall be entitled to receive all compensation earned and all benefits and reimbursements due through the effective date of termination. Employee shall not be entitled to any additional compensation subsequent to termination.

   c. At any time during the Term, Employee may retire or otherwise resign his employment with the Company provided that he first provides at least thirty (30) days prior written notice to the Company of his intent to terminate this Agreement, with the date of his retirement or resignation specified in such notice.

7. **Deemed Resignations.** Unless otherwise agreed to in writing by the Company and Employee prior to the termination of Employee's employment, any termination of Employee's employment shall constitute (a) an automatic resignation of Employee as an officer of the Company and each affiliate of the Company (if applicable), and (b) an automatic resignation of Employee from the Board (if applicable), and from the board of directors or similar governing body of any corporation, limited liability entity or other entity in which the Company or any affiliate holds an equity interest and with respect to which board or similar governing body Employee serves as the Company's or such affiliate's designee or other representative (if applicable).

8. **No Breach of Prior Agreements.** Employee hereby represents and warrants to the Company that the execution of this Agreement by Employee and Employee's employment by the Company and the performance of Employee's duties hereunder shall not violate or be a breach of any agreement with a former employer, client or any other person or entity. Employee further represents and covenants that he will not bring to the Company or place on the Company's computer systems any confidential, proprietary or legally protected information belonging to, or obtained from, any previous employer ("**Prior Employer Information**") and under no circumstances shall Employee use or disclose Prior Employer Information in the course of his employment with the Company.

9. **Section 409A.** The intent of the parties is that the payments and benefits under this Agreement comply with or be exempt from Section 409A and, accordingly, to the maximum extent permitted, this Agreement shall be interpreted to be in compliance therewith. If the Company determines that any provision of this Agreement would cause Employee to incur any additional tax or interest under Section 409A (with specificity as to the reason therefor), the Company and Employee shall take commercially reasonable efforts to reform such provision to try to comply with or be exempt from Section 409A through good faith modifications to the minimum extent reasonably appropriate to conform with Section 409A, *provided* that any such modifications shall not increase the cost or liability to the Company. To the extent that any provision hereof is modified in order to comply with or be exempt from Section 409A, such modification shall be made in good faith and shall, to the maximum extent reasonably possible, maintain the original intent and economic benefit to Employee and the Company of the applicable provision without violating the provisions of Section 409A.

   To the extent that any reimbursements payable pursuant to this Agreement are subject to the provisions of Section 409A, any such reimbursements payable to Employee pursuant to this Agreement shall be paid to Employee no later than December 31 of the year following the year in which the expense was incurred, the amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year, and Employee's right to reimbursement under this Agreement will not be subject to liquidation or exchange for another benefit.

   Notwithstanding any provision of this Agreement to the contrary, if the payment of any amount or benefit under this Agreement would be subject to additional taxes and interest under Section 409A because the timing of such payment is not delayed as provided therein and the regulations thereunder, then any such amount or benefit that Employee would otherwise be entitled to during the first six months following Employee's date of termination of employment shall be accumulated and paid or provided, as applicable, on the date that is six months after the date of Employee's date of termination (or if the such date does not fall on a business day of the Company, the next following business day of the Company), or such earlier date upon which such amount or benefit can be paid or provided under Section 409A without being subject to such additional taxes and interest.

10. **Withholding of Taxes and Other Deductions.** The Company may withhold from any benefits and payments made pursuant to this Agreement all federal, state, city and other taxes and withholdings as may be required pursuant to any law or governmental regulation or ruling and all other customary deductions made with respect to the Company's employees generally. The Company shall be entitled to rely on an opinion of counsel if any questions as to the amount or requirement of withholding shall arise.

11. **Assignment.** Employee understands that he has been selected for employment by the Company on the basis of his personal qualifications, experience and skills. Employee, therefore, shall not assign all or any portion of Employee's performance under this Agreement. Subject to the preceding two sentences, this Agreement shall be binding upon, inure to the benefit of, and be enforceable by the parties hereto and their respective heirs, legal representatives, successors and assigns. Employee recognizes that the Company may assign this Agreement.

12. **Notices.** All notices or other communications that are required or may be delivered under this Agreement shall be in writing, and shall be deemed duly delivered on the same business day as delivery by hand or by fax with machine confirmation of complete transmission, or three (3) business days after delivery by deposit as United States certified mail return receipt requested, or the next business day after delivery by deposit with an overnight courier, to the parties hereto at the addresses set forth below (as the same may be changed from time to time by notice similarly given) or the last known business or residence address of such other person as may be designated by either party hereto in writing:

    a. If to the Company:

        Mirna Therapeutics, Inc.
        2150 Woodward St., Suite 100
        Austin, Texas 78744
        Attention: Paul Lammers, M.D., President & Chief Executive Officer

    b. If to Employee:

        Vincent J. O'Neill, M.D.
        [Address]

13. **Waiver of Breach.** A waiver by the Company or Employee of a breach of any provision of this Agreement by the other party shall not operate or be construed as a waiver of any other breach by the other party.

14. **Governing Law.** This Agreement shall be governed by the laws of the State of Texas, without regard to its or any other jurisdiction's conflict of laws provisions. The Parties hereby submit to the jurisdiction of the Texas courts, both state and federal, in all matters concerning this Agreement.

15. **Severability.** If one or more of the provisions of this Agreement shall be found to be illegal or invalid, it shall not affect the legality or validity of any of the remaining provisions. A court of competent jurisdiction shall have the authority to modify or replace the invalid or unenforceable term or provision with a valid and enforceable term or provision which most accurately represents the intention of the parties hereto with respect to the invalid or unenforceable term or provision.

16. **Entire Agreement; Amendment.** This Agreement, including the attached Exhibit, constitutes and contains the entire agreement of the parties and supersedes any and all prior negotiations, correspondence, understandings and agreements between the parties respecting the subject matter hereof. This Agreement may be modified only by an agreement in writing executed by each of the parties hereto.

17. **Eligibility**. As required by applicable law, this offer and Agreement are subject to satisfactory proof of Employee's right to work in the United States of America. It is required that Employee bring the appropriate documentation with Employee at the time of employment.

18. **Headings.** The section headings contained in this Agreement are for reference purposes only and shall not affect in any way the meaning or interpretation of this Agreement.

19. **Counterparts.** This Agreement may be signed in counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

[Signature page follows]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective duly authorized representatives.

MIRNA THERAPEUTICS, INC.

By: /s/ Paul Lammers
Name: Paul Lammers, M.D., M.Sc.
Title: President & Chief Executive Officer

VINCENT J. O'NEILL, M.D.

/s/ Vincent O'Neill

Exhibit 31.1

CERTIFICATION OF THE CHIEF EXECUTIVE OFFICER
PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13A-14(A) AND 15D-14(A)

I, Paul Lammers, certify that:

1. I have reviewed this Annual Report on Form 10-K of Mirna Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 14, 2017

/s/ Paul Lammers

Paul Lammers, M.D., M.Sc.
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF THE CHIEF FINANCIAL OFFICER
PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13A-14(A) AND 15D-14(A)

I, Alan Fuhrman, certify that:

1. I have reviewed this Annual Report on Form 10-K of Mirna Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 14, 2017

/s/ Alan Fuhrman
Alan Fuhrman
Chief Financial Officer
(Principal Financial & Accounting Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Mirna Therapeutics, Inc. (the "Company") on Form 10-K for the fiscal year ended December 31, 2016, as filed with the Securities and Exchange Commission (the "Report"), Paul Lammers, Chief Executive Officer of the Company, and Alan Fuhrman, Chief Financial Officer of the Company, respectively, do each hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 14, 2017

/s/ Paul Lammers

Paul Lammers, M.D., M.Sc.
Chief Executive Officer
(Principal Executive Officer)

/s/ Alan Fuhrman

Alan Fuhrman
Chief Financial Officer
(Principal Financial & Accounting Officer)