

Matinas BioPharma Holdings, Inc.

10,382,500 Shares
Common Stock

This prospectus relates to the offer for sale of up to an aggregate of 10,382,500 shares of common stock underlying warrants held by the selling stockholders.

Our common stock is listed for quotation on the OTCQB Market operated by OTC Markets Group, Inc. (or OTCQB) under the ticker symbol "MTNB." On May 7, 2015, the closing price of our common stock was \$0.90.

Following the effectiveness of the registration statement of which this prospectus forms a part, the sale and distribution of securities offered hereby may be effected in one or more transactions that may take place on the OTC Bulletin Board and/or OTCQB Market, including ordinary brokers' transactions, privately negotiated transactions or through sales to one or more dealers for resale of such securities as principals, at market prices prevailing at the time of sale, at prices related to such prevailing market prices or at negotiated prices. Usual and customary or specifically negotiated brokerage fees or commissions may be paid by the selling stockholders. See "Plan of Distribution."

The selling stockholders and intermediaries through whom such securities are sold may be deemed "underwriters" within the meaning of the Securities Act of 1933, as amended, with respect to the securities offered hereby, and any profits realized or commissions received may be deemed underwriting compensation.

We are an "emerging growth company" under the federal securities laws and will be subject to reduced public company reporting requirements. Investing in our common stock is highly speculative and involves a significant degree of risk. See "Risk Factors" beginning on page 5 of this prospectus for a discussion of information that should be considered before making a decision to purchase our common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is May 8, 2015.

TABLE OF CONTENTS

| | <u>Page</u> |
|-----------------------------------------------------------------------------|-------------|
| <u>PROSPECTUS SUMMARY</u> | 2 |
| <u>RISK FACTORS</u> | 5 |
| <u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u> | 6 |
| <u>USE OF PROCEEDS</u> | 8 |
| <u>DIVIDEND POLICY</u> | 8 |
| <u>CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS</u> | 8 |
| <u>DESCRIPTION OF CAPITAL STOCK</u> | 13 |
| <u>SELLING STOCKHOLDERS</u> | 15 |
| <u>PLAN OF DISTRIBUTION</u> | 25 |
| <u>LEGAL MATTERS</u> | 27 |
| <u>EXPERTS</u> | 27 |
| <u>WHERE YOU CAN FIND ADDITIONAL INFORMATION</u> | 27 |
| <u>DOCUMENTS INCORPORATED BY REFERENCE</u> | 27 |

You should rely only on the information contained in this prospectus. We have not authorized any other person to provide you with information different from or in addition to that contained in this prospectus. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making an offer to sell these securities in any jurisdiction where an offer or sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

Additional risks and uncertainties not presently known or that are currently deemed immaterial may also impair our business operations. The risks and uncertainties described in this document and other risks and uncertainties which we may face in the future will have a greater impact on those who purchase our common stock. These purchasers will purchase our common stock at the market price or at a privately negotiated price and will run the risk of losing their entire investments.

For investors outside the United States: We have not done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. You are required to inform yourselves about and to observe any restrictions relating to this offering and the distribution of this prospectus.

In this prospectus, we rely on and refer to information and statistics regarding our industry. We obtained this statistical, market and other industry data and forecasts from publicly available information.

PROSPECTUS SUMMARY

This summary highlights information contained in other parts of this prospectus. Because it is a summary, it does not contain all of the information that you should consider in making your investment decision. Before investing in our common stock, you should read the entire prospectus carefully, including our consolidated financial statements and the related notes included in this prospectus and the information set forth under the headings “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

When used herein, unless the context requires otherwise, references to the “Company,” “we,” “our” and “us” refer to Matinas BioPharma Holdings, Inc., a Delaware corporation, collectively with its wholly-owned subsidiaries, Matinas BioPharma, Inc., a Delaware corporation, which we sometimes refer to herein as Matinas BioPharma, and Aquarius Biotechnologies, Inc., a Delaware corporation, which we sometimes refer to herein as Aquarius.

Our Company

On January 29, 2015, we completed the acquisition of Aquarius Biotechnologies Inc., (referred to as the “Aquarius Merger” throughout this document and which is discussed in more detail under “Recent Developments”), a New Jersey-based, early-stage pharmaceutical company focused on the development of differentiated and orally delivered therapeutics based on a proprietary, lipid-based, drug delivery platform called “cochleate delivery technology.” Following the Aquarius Merger, we are a clinical-stage biopharmaceutical company focused on the development of targeted therapeutics using our innovative lipid-based drug delivery platform with an initial focus on the treatment of serious fungal and bacterial infections and the development of lipid-based prescription therapeutics for the treatment of cardiovascular and metabolic conditions.

Our proprietary cochleate delivery technology platform, licensed from Rutgers University on an exclusive worldwide basis, is designed specifically for the targeted and safe delivery of pharmaceuticals directly to the site of infection or inflammation. We believe this platform represents a significant innovation that may result in meaningful improvements to currently available therapies to treat numerous life-threatening diseases, including serious fungal infections and multi-drug resistant, or MDR, gram-negative bacterial infections.

Our lead product candidate for the treatment of infectious diseases is MAT 2203, an oral formulation of a broad spectrum anti-fungal drug called amphotericin B using our acquired cochleate delivery technology, for which a single-dose Phase 1a study has been completed. We expect to commence and complete a Phase 2a study of MAT2203 in collaboration with the National Institute of Allergy and Infectious Diseases, or NIAID, of the National Institutes of Health, or NIH, in 2015, with results expected in the fourth quarter of 2015. We are developing a pipeline of oral products by applying our cochleate delivery technology to a potentially broad array of established pharmaceuticals, including MAT 2501, an application of our cochleate delivery technology to a broad spectrum intravenous(IV)-delivered aminoglycoside antibiotic called amikacin, which is most often used for treating severe, hospital-acquired infections, including Gram-negative bacterial infections. We also continue to focus on identifying and developing novel pharmaceutical lipid-based products, including MAT9001 with an initial indication for the treatment of highly elevated triglycerides, or severe hypertriglyceridemia. Finally, our MAT8800 discovery program is seeking to identify and develop product candidates derived from omega-3 fatty acids for the treatment of non-alcoholic fatty liver disease for which there are currently no therapeutic solutions available.

Implications of Being an Emerging Growth Company

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and, for as long as we continue to be an “emerging growth company,” we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies but not to “emerging growth companies,” including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, 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. We could be an “emerging growth company” for up to five years, or until the earliest of (i) the last day of the first fiscal year in which our annual gross revenues exceed \$1 billion, (ii) the date that we become a “large accelerated filer” as defined in Rule 12b-2 under the Securities Exchange Act of 1934, as amended, which would occur if the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the last business day of our most recently completed second fiscal quarter, or (iii) the date on which we have issued more than \$1 billion in non-convertible debt during the preceding three-year period. We have taken advantage of reduced reporting requirements in this prospectus. Accordingly, the information contained herein may be different from the information you receive from other public companies in which you hold stock. Also, we have irrevocably elected to “opt out” of the extended transition periods available under the JOBS Act for complying with new or revised accounting standards and, therefore, will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Corporate Information

Matinas BioPharma Holdings Inc., sometimes referred to herein as Holdings, is a Delaware corporation formed in May 2013. Holdings is the parent company of two operating subsidiaries: Matinas BioPharma, Inc., a Delaware corporation, and Aquarius Biotechnologies Inc., a Delaware corporation. Nereus BioPharma LLC, a Delaware limited liability company (and Matinas BioPharma's predecessor) was formed on August 12, 2011. On February 29, 2012, Nereus BioPharma LLC converted from a limited liability company to a corporation and changed its name to Matinas BioPharma, Inc. On January 29, 2015, we acquired Aquarius Biotechnologies Inc.

Our principal offices are located at 1545 Route 206 South, Suite 302, Bedminster, New Jersey 07921. Our web address is www.matinasbiopharma.com. Information contained in or accessible through our web site is not, and should not be deemed to be, part of this prospectus. You should not rely on our website or any such information in making your decision whether to purchase our common stock.

We currently do not own or license any U.S. federal trademark registrations or applications. Some trademarks referred to in this prospectus are referred to without the ® and ™ symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto.

THE OFFERING

Common Stock Outstanding 56,900,670 shares (1)

**Common Stock, including Shares of
Common Stock underlying Warrants,
Offered by Selling Stockholders** 10,382,500 shares (2)

Use of Proceeds We will not receive any proceeds from the sale of the common stock underlying the warrants by the selling stockholders. We would, however, receive proceeds upon the exercise of the warrants held by the selling stockholders which, if such warrants are exercised in full (and assuming no “cashless” exercise features are utilized), would be approximately \$20,765,000. Proceeds, if any, received from the exercise of such warrants will be used for working capital and general corporate purposes. No assurances can be given that any of such warrants will be exercised.

Quotation of Common Stock: Our common stock is listed for quotation on the OTCQB Market operated by OTC Markets Group, Inc. (or OTCQB) under the ticker symbol “MTNB.”

Risk Factors An investment in our company is highly speculative and involves a significant degree of risk. See “Risk Factors” and other information included in this prospectus for a discussion of factors you should carefully consider before deciding to invest in shares of our common stock.

-
- (1) Excludes: (i) outstanding options to purchase 6,308,417 shares of our common stock, as of March 31, 2015, at a weighted average exercise price of \$0.96 per share; (ii) up to 2,879,056 shares of our common stock that are available, as of March 31, 2015, for future issuance under our 2013 Equity Compensation Plan; (iii) 7,500,000 shares of our common stock underlying the Investor Warrants, which have an exercise price of \$2.00 per share, issued in our 2013 Private Placement, (iv) 1,000,000 shares of common stock underlying the Merger Warrants, which have an exercise price of \$2.00 per share, issued in connection with the Merger, (v) 500,000 shares of common stock underlying the Private Placement Warrants, which have an exercise price of \$2.00 per share, issued in the warrant private placement, (vi) 4,000,000 shares of our common stock underlying the Formation Warrants, which have an exercise price of \$2.00 per share, issued in connection with the formation of Holdings, (vii) 1,500,000 shares of our common stock underlying warrants, which have an exercise price of \$1.00 per share, issued to the Placement Agent in the 2013 Private Placement, (viii) 750,000 shares of our common stock underlying warrants, which have an exercise price of \$2.00 per share issued to the Placement Agent in the 2013 Private Placement, (ix) 20,000,000 shares of common stock underlying the 2015 Investor Warrants with an exercise price of \$0.75 per share, (x) 2,000,000 shares of common stock underlying warrants issued to the Placement Agent in the 2015 Private Placement with an exercise price of \$0.75 per share and (xi) 2,000,000 shares of common stock underlying warrants issued to the Placement Agent in the 2015 Private Placement with an exercise price of \$0.50 per share.
- (2) Consists of: (i) 7,457,500 shares of our common stock underlying the Investor Warrants, which have an exercise price of \$2.00 per share, (ii) 1,000,000 shares of our common stock underlying the Merger Warrants, which have an exercise price of \$2.00 per share, (iii) 500,000 shares of our common stock underlying the Private Placement Warrants, which have an exercise price of \$2.00 per share, and (iv) 1,425,000 shares of our common stock underlying the Formation Warrants, which have an exercise price of \$2.00 per share.

RISK FACTORS

Investment in our common stock involves risks. Prior to making a decision about investing in our common stock, you should consider carefully the risk factors incorporated by reference in this prospectus, including the risk factors described in the section entitled “Risk Factors” contained in our Annual Report on Form 10-K for the fiscal year ended December 31, 2014, filed with the SEC. Those risks and uncertainties are not the only risks and uncertainties we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations. If any of these risks actually occur, our business, results of operations and financial condition could suffer. In that event the trading price of our common stock could decline, and you may lose all or part of your investment.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains “forward-looking statements,” which include information relating to future events, future financial performance, financial projections, strategies, expectations, the competitive environment and regulation. In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “could,” “would,” “predicts,” “potential,” “continue,” “expects,” “anticipates,” “future,” “intends,” “plans,” “believes,” “estimates,” and similar expressions, as well as statements in future tense. Forward-looking statements should not be read as a guarantee of future performance or results and may not be accurate indications of when such performance or results will be achieved, if at all. Forward-looking statements are based on information we have available to us when such statements are made or on management’s good faith belief as of that time with respect to such future events, and are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward-looking statements. Important factors that could cause such differences include, but are not limited to:

- our limited operating history;
- our history of operating losses in each year since inception and the expectation that we will continue to incur operating losses for the foreseeable future;
- our ability to raise additional capital to fund our operations and to develop our product candidates;
- our dependence on product candidates, which are still in an early development stage;
- our ability to integrate our recent acquisition of Aquarius Biotechnologies, Inc.;
- our reliance on proprietary cochleate drug delivery technology, which is licensed to us by Rutgers University;
- our ability to manufacture GMP batches of our product candidates which are required for pre-clinical and clinical trials and, subsequently, our ability to manufacture commercial quantities;
- our ability to complete required clinical trials for our lead product candidate and other product candidates and obtain approval from the FDA or other regulatory agents in different jurisdictions;
- our lack of a sales and marketing organization and our ability to commercialize products, if we obtain regulatory approval;
- our dependence on third-parties, including third-parties to manufacture and third-party CROs to conduct our clinical trials;
- our ability to maintain or protect the validity of our patents and other intellectual property;
- our ability to retain key executive members;
- our ability to internally develop new inventions and intellectual property;
- interpretations of current laws and the passages of future laws
- acceptance of our business model by investors;
- our ability to adequately support growth; and
- the factors listed under the headings “Risk Factors” in the reports that we file with the Securities and Exchange Commission, which are incorporated by reference herein.

The foregoing does not represent an exhaustive list of matters that may cause actual performance or results to differ materially from those expressed in or suggested by forward-looking statements contained herein. Please see “Risk Factors” for additional risks which could adversely impact our business and financial performance.

Moreover, new risks regularly emerge and it is not possible for our management to predict or articulate all of the risks we face, nor can we assess the impact of all risks on our business or the extent to which any risk, or combination of risks, may cause actual results to differ from those contained in any forward-looking statements. Given these uncertainties, you should not place undue reliance on these forward-looking statements. All forward-looking statements included in this prospectus are based on information available to us on the date of this prospectus. Except to the extent required by applicable laws or rules, we undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise. All subsequent written and oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the cautionary statements contained above and throughout this prospectus.

USE OF PROCEEDS

We will not receive any of the proceeds from the sale of the common stock underlying the warrants by the selling stockholders named in this prospectus. All proceeds from the sale of the common stock will be paid directly to the selling stockholders.

We would, however, receive proceeds upon the exercise of the warrants held by the selling stockholders which, if such warrants are exercised in full (and assuming no “cashless” exercise features are utilized), would be approximately \$20,765,000. Proceeds, if any, received from the exercise of such warrants will be used for working capital and general corporate purposes. No assurances can be given that any of such warrants will be exercised.

DIVIDEND POLICY

We have never paid any cash dividends on our common stock. We anticipate that we will retain funds and future earnings to support operations and to finance the growth and development of our business. Therefore, we do not expect to pay cash dividends in the foreseeable future. Any future determination to pay dividends will be at the discretion of our board of directors and will depend on our financial condition, results of operations, capital requirements and other factors that our board of directors deems relevant. In addition, the terms of any future debt or credit financings may preclude us from paying dividends.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Other than compensation arrangements for our named executive officers and directors, we describe below each transaction or series of similar transactions, since January 1, 2012, to which we were a party or will be a party, in which:

- the amounts involved exceeded or will exceed \$120,000; and
- any of our directors, executive officers or holders of more than 5% of our capital stock, or any member of the immediate family of the foregoing persons, had or will have a direct or indirect material interest.

Formation of Matinas

In connection with our formation in June 2013, we sold an aggregate of 7,500,000 shares of our Common Stock and 3,750,000 warrants (the “Formation Warrants”) to purchase 3,750,000 shares of our Common Stock, at an exercise price of \$2.00 per share, for an aggregate of \$375,000 (at a purchase price of \$0.10 for two shares and one warrant), including 2,000,000 shares and warrants to purchase 1,000,000 shares of our Common Stock to Adam Stern and entities owned by Mr. Stern. Mr. Stern is a member of our board of directors. In addition, at such time, we sold to an entity owned by Mr. Stern Formation Warrants to purchase 250,000 shares of our Common Stock at a purchase price of \$10,000 (a price of \$0.04 per warrant).

2013 Private Placement

In July and August 2013, we completed a private placement, the 2013 Private Placement, under which we sold an aggregate of 15,000,000 shares of our Common Stock and warrants to purchase an aggregate of 7,500,000 shares of our Common Stock with an exercise price of \$2.00 per share, which warrants are exercisable for a period of five years from the initial closing date of July 30, 2013 (the “2013 Investor Warrants”). In the 2013 Private Placement, Herbert Conrad, our chairman of the board, purchased 250,000 shares of Common Stock and 2013 Investor Warrants to purchase 125,000 shares of our Common Stock. Aegis Capital Corp., or Aegis, acted as the placement agent, or Placement Agent, for the 2013 Private Placement. The gross proceeds to us from the 2013 Private Placement were \$15 million.

In connection with the 2013 Private Placement, we paid the Placement Agent (i) a cash fee of \$1,500,000 and (ii) a non-accountable expense allowance equal to \$450,000. Mr. Stern is an affiliate of Aegis. In addition, as part of its compensation for acting as placement agent for the 2013 Private Placement, we issued (x) warrants to the Placement Agent to purchase 750,000 shares of our Common Stock with an exercise price of \$2.00 per share and (y) warrants to the Placement Agent to purchase 1,500,000 shares of our Common Stock with an exercise price of \$1.00 per share. Such warrants, the 2013 Placement Agent Warrants, contain a “cashless exercise” feature and are exercisable at any time prior to July 30, 2018.

In connection with the closing of the 2013 Private Placement, the Placement Agent was granted the right to appoint one member of our Board of Directors for a two-year term from the initial closing. Adam Stern, the Aegis Nominee, was appointed to the Board of Directors at the initial closing and his successor, if any, will be chosen by the Placement Agent, subject to the reasonable approval of the Company and the Voting Agreement described below.

We have agreed to engage the Placement Agent as our warrant solicitation agent in the event the 2013 Investor Warrants are called for redemption and shall pay a warrant solicitation fee to the Placement Agent equal to five (5%) percent of the amount of funds solicited by the Placement Agent upon the exercise of the 2013 Investor Warrants following such call for redemption.

Consulting Agreement

We also entered into a consulting agreement with the Placement Agent in July 2013. The consulting agreement had a term of 12 months pursuant to which we paid the Placement Agent \$20,000 per month. Under the terms of the consulting agreement, the Placement Agent agreed to provide customary financial advisory services as reasonably requested by us, including consulting services for financing and capital markets activity, mergers, acquisitions, joint ventures and licensing agreements. This consulting agreement terminated on July 30, 2014.

Voting Agreement

In connection with the initial closing of the 2013 Private Placement, the stockholders of Matinas BioPharma, Inc. (“Matinas BioPharma”) prior to the 2013 Merger (as defined below) and the 2013 Private Placement (the “Matinas Stockholders”) and the stockholders of the Company prior to the Merger (the “Company Stockholders”), entered into a Voting Agreement (the “Voting Agreement”). Pursuant to the terms of the Voting Agreement, (i) the Matinas Stockholders have the right to nominate four (4) members to our Board (the “Matinas Stockholders’ Nominees”), (ii) the Company Stockholders will vote in favor of the election and removal of the Matinas Stockholders’ Nominees and (iii) the Company Stockholders shall nominate the Aegis Nominee to our Board and (iv) the Matinas Stockholders shall vote in favor of the election and removal of the Aegis Nominee. The Voting Agreement will expire upon the earlier of (i) the approval of at least 75% of the Matinas Stockholders and the Company Stockholders voting together based upon their ownership of our Common Stock or (ii) the closing of a firm commitment underwritten public offering of shares of our Common Stock resulting in gross proceeds of at least \$20 million.

2013 Merger Transaction

In July 2013, Matinas BioPharma, Inc. entered into a merger agreement (the “2013 Merger Agreement”) with Matinas Merger Sub, Inc., a Delaware corporation and our wholly owned subsidiary, or Merger Sub. Pursuant to the terms of the 2013 Merger Agreement, as a condition of and contemporaneously with the initial closing of the 2013 Private Placement, Merger Sub merged (the “2013 Merger”) with and into Matinas BioPharma and Matinas BioPharma became a wholly owned subsidiary of ours. In connection with the 2013 Merger, all shares of common stock and preferred stock of Matinas BioPharma were cancelled and the stockholders of Matinas BioPharma received an aggregate of 9,000,000 shares of our Common Stock and warrants to purchase 1,000,000 shares of our Common Stock at an exercise price of \$2.00 per share (the “Merger Warrants”), including Herbert Conrad, our chairman of the board, who received 351,563 shares of our Common Stock and 250,000 Merger Warrants; Roelof Rongen, our president and chief executive officer, who received 3,417,186 shares of our Common Stock, Abdel A. Fawzy, our executive vice president, pharmaceutical development and supply chain development, who received 1,708,593 shares of our Common Stock; George Bobotas, our executive vice president and chief scientific officer, and his spouse, who received an aggregate of 1,366,875 shares of our Common Stock; Jerome Jabbour, our executive vice president, chief business officer and general counsel, who received 759,374 shares of our Common Stock; and Stefano Ferrari, a member of our board of directors, through an entity controlled by him, who received 351,563 shares of our Common Stock and 250,000 Merger Warrants.

Warrant Private Placement

Contemporaneously with the initial closing of the 2013 Private Placement, we sold 500,000 warrants (“Private Placement Warrants”) in a private placement to Herbert Conrad, our chairman of the board, for a purchase price of \$0.04 per warrant. The Private Placement Warrants have an exercise price of \$2.00 per share. The Private Placement Warrants were offered to all preferred stockholders of Matinas BioPharma prior to the 2013 Merger, including Mr. Conrad. See the section entitled “Description of Capital Stock –Warrants” for a discussion of the terms of the Private Placement Warrants.

Vendor Agreement

Since January 1, 2011, we have submitted orders for the purchase of an omega-3 fatty acid concentrate from KD-Pharma Bexbach GmbH, or KD Pharma, totaling approximately \$326,220. Mr. Ferrari, a member of our board, is the brother of a part owner of the holding company that owns KD Pharma.

2015 Private Placement

In March and April 2015, we completed a private placement, or the 2015 Private Placement, pursuant to which we sold to accredited investors an aggregate of 20,000,000 units at a price of \$0.50 per unit, with each unit consisting of: (i) one share of our Common Stock, and (ii) a five-year warrant to purchase one share of Common Stock at an exercise price of \$0.75 per share (the “2015 Investor Warrants”). The gross proceeds to us from the 2015 Private Placement were \$10.0 million. Certain of our officers, directors and holders of more than 5% of our capital stock purchased units in the 2015 Private Placement as set forth below.

| Name | Number of Units Purchased | Aggregate Purchase Price Paid |
|-------------------------------------------|---------------------------------|-------------------------------------|
| GJG Life Sciences, LLC | 3,935,880 | \$ 1,967,940 |
| Laurence G. Allen and affiliated entities | 1,200,000 | 600,000 |
| Herbert Conrad | 1,000,000 | 500,000 |
| Adam Stern and affiliated entities | 800,000 | 400,000 |
| James Scibetta | 100,000 | 50,000 |
| Roelof Rongen | 50,000 | 25,000 |
| Douglas Kling | 40,000 | 20,000 |
| Gary Gaglione | 20,000 | 10,000 |

We entered into a Placement Agency Agreement with Aegis Capital Corp. pursuant to which Aegis acted as our exclusive placement agent for the 2015 Private Placement. Immediately prior to the 2015 Private Placement, the Placement Agent and its affiliates beneficially owned an aggregate of more than 10% of our outstanding equity securities. In addition, Adam Stern, Head of Private Equity Banking at Aegis, is a member of our board of directors. Pursuant to the terms of the Placement Agency Agreement, in connection with the 2015 Private Placement, we paid the Placement Agent an aggregate cash fee of \$1,000,000 and non-accountable expense allowance of \$300,000 and will issue to the Placement Agent or its designees warrants (substantially similar to the Warrants) to purchase 2,000,000 shares of Common Stock at \$0.50 per share and additional warrants to purchase 2,000,000 shares of Common Stock at \$0.75 per share. In addition, we agreed to engage the Placement Agent as our warrant solicitation agent in the event the 2015 Investor Warrants are called for redemption and shall pay a warrant solicitation fee to the Placement Agent equal to five (5%) percent of the amount of funds solicited by the Placement Agent upon the exercise of the 2015 Investor Warrants following such redemption.

Indemnification Agreements

We entered into indemnification agreements with our directors and executive officers. The indemnification agreements provide for indemnification against expenses, judgments, fines and penalties actually and reasonably incurred by an indemnitee in connection with threatened, pending or completed actions, suits or other proceedings, subject to certain limitations. The indemnification agreements also provide for the advancement of expenses in connection with a proceeding prior to a final, nonappealable judgment or other adjudication, provided that the indemnitee provides an undertaking to repay to us any amounts advanced if the indemnitee is ultimately found not to be entitled to indemnification by us. The indemnification agreement set forth procedures for making and responding to a request for indemnification or advancement of expenses, as well as dispute resolution procedures that apply to any dispute between us and an indemnitee arising under the Indemnification Agreements.

Policies and Procedures for Related Party Transactions

We have adopted a policy that our executive officers, directors, nominees for election as a director, beneficial owners of more than 5% of any class of our Common Stock, any members of the immediate family of any of the foregoing persons and any firms, corporations or other entities in which any of the foregoing persons is employed or is a partner or principal or in a similar position or in which such person has a 5% or greater beneficial ownership interest, which we refer to collectively as related parties, are not permitted to enter into a transaction with us without the prior consent of our board of directors acting through the audit committee or, in certain circumstances, the chairman of the audit committee. Any request for us to enter into a transaction with a related party, in which the amount involved exceeds \$100,000 and such related party would have a direct or indirect interest must first be presented to our audit committee, or in certain circumstances the chairman of our audit committee, for review, consideration and approval. In approving or rejecting any such proposal, our audit committee, or the chairman of our audit committee, is to consider the material facts of the transaction, including, but not limited to, whether the transaction is on terms no less favorable than terms generally available to an unaffiliated third party under the same or similar circumstances, the extent of the benefits to us, the availability of other sources of comparable products or services and the extent of the related party's interest in the transaction.

DESCRIPTION OF CAPITAL STOCK

Our current Certificate of Incorporation authorizes us to issue:

- 150,000,000 shares of Common Stock, par value \$0.0001 per share; and
- 10,000,000 shares of Preferred Stock, par value \$0.0001 per share, none of which have yet been designated.

As of the date of this prospectus, there were 56,900,670 shares of our Common Stock and no shares of our preferred stock outstanding.

The following statements are summaries only of the material provisions of our authorized capital stock and are qualified in their entirety by our Certificate of Incorporation, which is filed as an exhibit to the registration statement of which this prospectus forms a part. You should review these documents for a description of the rights, restrictions and obligations relating to our capital stock.

Common Stock

Voting. The holders of our Common Stock are entitled to one vote for each share held of record on all matters on which the holders are entitled to vote (or consent to).

Dividends. The holders of our Common Stock are entitled to receive, ratably, dividends only if, when and as declared by our Board of Directors out of funds legally available therefor and after provision is made for each class of capital stock having preference over the Common Stock (including the Common Stock).

Liquidation Rights. In the event of our liquidation, dissolution or winding-up, the holders of our Common Stock are entitled to share, ratably, in all assets remaining available for distribution after payment of all liabilities and after provision is made for each class of capital stock having preference over the Common Stock (including the Common Stock).

Conversion Rights. The holders of our Common Stock have no conversion rights.

Preemptive and Similar Rights. The holders of our Common Stock have no preemptive or similar rights.

Redemption/Put Rights. There are no redemption or sinking fund provisions applicable to the Common Stock. All of the outstanding shares of our Common Stock are fully-paid and nonassessable.

Preferred Stock

We are authorized to issue up to 10,000,000 shares of preferred stock, par value \$0.0001 per share, with such designations, rights, and preferences as may be determined from time to time by our Board of Directors. Accordingly, our Board of Directors is empowered, without stockholder approval, to issue preferred stock with dividend, liquidation, conversion, voting, or other rights that could adversely affect the voting power or other rights of the holders of our Common Stock. The issuance of preferred stock could have the effect of restricting dividends on our Common Stock, diluting the voting power of our Common Stock, impairing the liquidation rights of our Common Stock, or delaying or preventing a change in control of our company, all without further action by our stockholders. We have no shares of our preferred stock outstanding.

Warrants

As of the date of this prospectus, we had outstanding warrants (consisting of 2013 Investor Warrants, Private Placement Warrants, warrants issued to the Placement Agent in our 2013 Private Placement, the 2015 Investor Warrants and warrants issued to the Placement Agent in our 2015 Private Placement) to purchase an aggregate of 29,250,000 shares of Common Stock at exercise prices ranging from \$0.50 to \$2.00 per share. These warrants are presently exercisable and have a five-year term. The warrants may be exercised at any time in whole or in part upon payment of the applicable exercise price until expiration of the warrants. No fractional shares will be issued upon the exercise of the warrants. The warrants may be exercised on a “cashless” basis in certain circumstances, except the 2013 Placement Agent Warrants and 2015 Placement Agent Warrants which may be exercised on a “cashless” basis at any time.

The exercise price and the number of warrant shares purchasable upon the exercise of the warrants are subject to adjustment upon the occurrence of certain events, including stock dividends, stock splits, combinations and reclassifications of our capital stock. Additionally, an adjustment would be made in the case of a reclassification or exchange, consolidation or merger of our company with or into another corporation (other than a consolidation or merger in which we are the surviving corporation) or sale of all or substantially all of our assets in order to enable holders of the warrants to acquire the kind and number of shares of stock or other securities or property receivable in such event by a holder of the number of shares Common Stock that might otherwise have been purchased upon the exercise of the warrants.

We may call the 2013 Investor Warrants and the Private Placement Warrants at any time the Common Stock trades above \$5.00 for the twenty (20) consecutive trading days immediately prior to such a call, provided that such warrants can only be called if the registration statement covering the resale of the shares of Common Stock underlying the 2013 Investor Warrants and the Private Placement Warrants is current and remains effective at the time of the call and provided further that we can only call the 2013 Investor Warrants for redemption, if we also call the Private Placement Warrants for redemption on the terms described above. The 2013 Placement Agent Warrants do not have a redemption feature.

We may call the 2015 Investor Warrants at any time the closing bid price for our Common Stock is at or above \$3.00 for the twenty (20) consecutive days immediately prior to such a call and following the effectiveness of the registration statement covering the resale of the shares of Common Stock underlying the 2015 Investor Warrants. The 2015 Investor Warrants can only be called if such registration statement is current and remains effective at the time of the call. The 2015 Placement Agent Warrants do not have a redemption feature.

Options

As of the date of this prospectus, we had outstanding options to purchase an aggregate of 6,308,417 shares of our Common Stock with exercise prices ranging from \$0.41 to \$1.28 per share.

Transfer Agent and Registrar

VStock Transfer, LLC is the transfer agent and registrar for our Common Stock.

Quotation of Securities

Our Common Stock is quoted on the OTCQB. On May 7, 2015, the closing price of our common stock was \$0.90.

Anti-Takeover Effect of Delaware Law, Certain Charter and Bylaw Provisions

Our certificate of incorporation and bylaws contain provisions that could have the effect of discouraging potential acquisition proposals or tender offers or delaying or preventing a change of control of our company. These provisions are as follows:

- they provide that special meetings of stockholders may be called only by the board of directors, President or our Chairman of the Board of Directors, or at the request in writing by stockholders of record owning at least fifty (50%) percent of the issued and outstanding voting shares of Common Stock;
- they do not include a provision for cumulative voting in the election of directors. Under cumulative voting, a minority stockholder holding a sufficient number of shares may be able to ensure the election of one or more directors. The absence of cumulative voting may have the effect of limiting the ability of minority stockholders to effect changes in our board of directors; and
- they allow us to issue, without stockholder approval, up to 10,000,000 shares of preferred stock that could adversely affect the rights and powers of the holders of our Common Stock.

We are subject to the provisions of Section 203 of the General Corporation Law of the State of Delaware, an anti-takeover law. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in the following prescribed manner:

- prior to the time of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; and
- on or subsequent to the time of the transaction, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Generally, for purposes of Section 203, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An “interested stockholder” is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, owned 15% or more of a corporation’s outstanding voting securities.

SELLING STOCKHOLDERS

The following table sets forth information as of the date of this prospectus, to our knowledge, about the beneficial ownership of our common stock by the selling stockholders both before and immediately after the offering.

All of the selling stockholders received their registrable securities in: (i) our formation, (ii) 2013 Private Placement; and/or (iii) the Warrant Private Placement, in each case prior to the initial filing date of the registration statement of which this prospectus is a part. We believe that the selling stockholders have sole voting and investment power with respect to all of the shares of common stock beneficially owned by them unless otherwise indicated. We believe that all securities purchased by broker-dealers or affiliates of broker-dealers were purchased by such persons and entities in the ordinary course of business and at the time of purchase, such purchasers did not have any agreements or understandings, directly or indirectly, with any person to distribute such securities.

The percent of beneficial ownership for the selling stockholders is based on 56,900,670 shares of common stock outstanding as the date of this prospectus. Warrants to purchase shares of our common stock held by certain investors that are currently exercisable or exercisable within 60 days of the date of this prospectus are considered outstanding and beneficially owned by such investors for the purpose of computing the percentage ownership of their respective percentage ownership but are not treated as outstanding for the purpose of computing the percentage ownership of any other stockholder. Unless otherwise stated below, to our knowledge, none of the selling stockholders has had a material relationship with us other than as a stockholder at any time within the past three years or has ever been one of our officers or directors.

Pursuant to Rules 13d-3 and 13d-5 of the Exchange Act, beneficial ownership includes any shares of our common stock as to which a stockholder has sole or shared voting power or investment power, and also any shares of our common stock which the stockholder has the right to acquire within 60 days, including upon exercise of warrants to purchase shares of our common stock.

The shares of common stock being offered pursuant to this prospectus may be offered for sale from time to time during the period the registration statement of which this prospectus is a part remains effective, by or for the account of the selling stockholders. After the date of effectiveness, the selling stockholders may have sold or transferred, in transactions covered by this prospectus or in transactions exempt from the registration requirements of the Securities Act, some or all of their common stock.

Information about the selling stockholders may change over time. Any changed information will be set forth in an amendment to the registration statement or supplement to this prospectus, to the extent required by law.

| Name of Selling Stockholder | Shares Beneficially Owned as of the date of this Prospectus ⁽¹⁾ | | Shares Offered by this Prospectus | Shares Beneficially Owned After the Offering ⁽¹⁾⁽²⁾ | |
|--------------------------------------------|----------------------------------------------------------------------------|---------|-----------------------------------|----------------------------------------------------------------|---------|
| | Number | Percent | | Number | Percent |
| A. Lauren Rhude Trust ⁽³⁾ | 30,000 | * | 10,000 | 20,000 | * |
| ABBA Properties Partnership ⁽⁴⁾ | 112,500 | * | 37,500 | 75,000 | * |
| Ali Bijan Rafie Trust ⁽⁵⁾ | 52,500 | * | 17,500 | 35,000 | * |
| Andrew Kaufman | 155,000 | * | 25,000 | 130,000 | * |
| Arnold Estates LLC ⁽⁶⁾ | 240,625 | * | 100,000 | 140,625 | * |
| Aspire Capital Fund LLC ⁽⁷⁾ | 125,000 | * | 125,000 | - | - |
| Bel-Cal Joint Venture ⁽⁸⁾ | 375,000 | * | 125,000 | 250,000 | * |

| | | | | | |
|-------------------------------------------------------------------------------------------------------------------|---------|------|---------|---------|------|
| Blue Ridge Financial Inc. ⁽⁹⁾ | 12,500 | * | 12,500 | - | - |
| Bret Shupack | 155,000 | * | 25,000 | 130,000 | * |
| Christine Hassuk | 15,000 | * | 5,000 | 10,000 | * |
| Clyde J. Berg 2011 Charitable Remainder Trust 2011 ⁽¹⁰⁾ | 150,000 | * | 50,000 | 100,000 | * |
| Collier Holdings LLC ⁽¹¹⁾ | 225,000 | * | 75,000 | 150,000 | * |
| Craig Benson | 240,626 | * | 100,000 | 140,626 | * |
| The Langston Family Revocable Trust (12) | 750,000 | 1.3% | 250,000 | 500,000 | * |
| Daniel Cardone | 10,000 | * | 10,000 | - | - |
| Daniel S. Travelle | 75,000 | * | 25,000 | 50,000 | * |
| David Blonder | 337,500 | * | 112,500 | 225,000 | * |
| David Filer | 75,000 | * | 25,000 | 50,000 | * |
| David Kovacs | 62,500 | * | 7,500 | 55,000 | * |
| David M. Kutz, Patricia A. Kutz | 150,000 | * | 50,000 | 100,000 | * |
| Deborah Chin | 232,500 | * | 12,500 | 225,000 | * |
| Dominion Pension Plan Trustees (Jersey) Limited as Trustee of the Raffaele Ricci Pension Trust ⁽¹³⁾ | 775,000 | 1.4% | 125,000 | 650,000 | 1.1% |
| Douglas P. Kaufman | 137,500 | * | 12,500 | 125,000 | * |
| Dov Sugarman | 37,500 | * | 12,500 | 25,000 | * |
| Fabrizio Balestri | 37,500 | * | 12,500 | 25,000 | * |
| Florence Luvera | 15,000 | * | 5,000 | 10,000 | * |
| FourJr. Investments LTD. ⁽¹⁴⁾ | 562,500 | * | 187,500 | 375,000 | * |
| Fred A Wagner, Sr. & Rhonda M. Wagner | 37,500 | * | 12,500 | 25,000 | * |
| Fred A. Wagner, Jr. & Allison K. Wagner | 75,000 | * | 25,000 | 50,000 | * |
| Frederick B Carson and Barbara Kim Carson Ttee U/A Dtd 2/16/06 Carson Living Trust ⁽¹⁵⁾ | 30,000 | * | 10,000 | 20,000 | * |

| | | | | | |
|--------------------------------------------------------------------------------------------|-----------|------|---------|-----------|------|
| Gerald and Lynnette Hannahs | 375,000 | * | 125,000 | 250,000 | * |
| Gerald Appel | 37,500 | * | 12,500 | 25,000 | * |
| Growth Ventures, Inc. Pension Plan & Trust ⁽¹⁶⁾ | 75,000 | * | 25,000 | 50,000 | * |
| Haitham Elsheikh | 425,000 | * | 75,000 | 350,000 | * |
| Henry Rothman | 93,750 | * | 31,250 | 62,500 | * |
| Ian Stern | 15,000 | * | 5,000 | 10,000 | * |
| Jack J. Springer, M.D., A Medical Corporation Defined Benefit Plan & Trust ⁽¹⁷⁾ | 25,000 | * | 25,000 | - | - |
| Jack Springer | 37,500 | * | 12,500 | 25,000 | * |
| Jacob Movtady | 15,000 | * | 5,000 | 10,000 | * |
| James and Sarah Lawler | 46,875 | * | 15,625 | 31,250 | * |
| Jan Koe | 93,750 | * | 31,250 | 62,500 | * |
| Jeffry F. Schoenbaum Revocable Trust U/A 3/4/96 ⁽¹⁸⁾ | 225,000 | * | 75,000 | 150,000 | * |
| Sodi Family Limited Partnership | 75,000 | * | 25,000 | 50,000 | * |
| JKW Family Ltd ⁽¹⁹⁾ | 300,000 | * | 100,000 | 200,000 | * |
| Joel Kovacs | 50,500 | * | 7,500 | 43,000 | * |
| John Burgraff | 75,000 | * | 25,000 | 50,000 | * |
| Joseph A. Scaniffe | 50,000 | * | 25,000 | 25,000 | * |
| Joseph Sharkey | 75,000 | * | 25,000 | 50,000 | * |
| Kalman A Barson | 15,000 | * | 5,000 | 10,000 | * |
| Keith E. Myers | 25,000 | * | 12,500 | 12,500 | * |
| Ken Chuzi IRA, Raymond James and Assoc. Inc. Custodian | 10,000 | * | 10,000 | - | - |
| Kenneth Weitzman | 93,750 | * | 31,250 | 62,500 | * |
| Kosir Living Trust ⁽²⁰⁾ | 93,750 | * | 31,250 | 62,500 | * |
| B. Kyle Smith | 15,000 | * | 5,000 | 10,000 | * |
| John E. Dell, Laura P. Dell ⁽²¹⁾ | 715,000 | 1.3% | 25,000 | 690,000 | 1.2% |
| Lester Petracca | 1,750,000 | 3.0% | 250,000 | 1,500,000 | 2.6% |
| LGA Investments Family Limited Partnership ⁽²²⁾ | 700,000 | 1.2% | 100,000 | 600,000 | 1.1% |
| Martin and Diana Wolmark | 75,000 | * | 75,000 | - | * |
| Marvin Boehm Family Trust ⁽²³⁾ | 45,000 | * | 15,000 | 30,000 | * |
| Mary L .Marcus - West Declaration of Trust ⁽²⁴⁾ | 52,500 | * | 17,500 | 35,000 | * |
| MAT9 LLC ⁽²⁵⁾ | 241,875 | * | 80,625 | 161,250 | * |

| | | | | | |
|--------------------------------------------------------------------|-----------|------|---------|-----------|------|
| Matthew D. and Regina M. MacLean | 37,500 | * | 12,500 | 25,000 | * |
| Maureen Campanella | 37,500 | * | 12,500 | 25,000 | * |
| Maurice Aaron | 75,000 | * | 25,000 | 50,000 | * |
| Michael D Ellerson IRA, Raymond James and Assoc. Inc. Custodian | 10,000 | * | 10,000 | - | - |
| Michael F Hannley IRA, Raymond James and Assoc. Inc. Custodian | 10,000 | * | 10,000 | - | - |
| Michael Garnick | 1,300,000 | 2.3% | 200,000 | 1,100,000 | 1.9% |
| Michael Lerner | 135,000 | * | 25,000 | 110,000 | * |
| Michael Marino and Gina Rue | 75,000 | * | 25,000 | 50,000 | * |
| M.J. Fil Investments LLC ⁽²⁶⁾ | 12,500 | * | 12,500 | - | - |
| Moogle Investors LLC ⁽²⁷⁾ | 300,000 | * | 100,000 | 200,000 | * |
| MSSB C/F James Moore IRA Rollover | 37,500 | * | 12,500 | 25,000 | * |
| MSSB C/F James P. Maher IRA Rollover ⁽²⁸⁾ | 37,500 | * | 12,500 | 25,000 | * |
| MSSB Custodian Bruce Emad IRA Rollover ⁽²⁹⁾ | 37,500 | * | 12,500 | 25,000 | * |
| Nickel River LLC ⁽³⁰⁾ | 150,000 | * | 50,000 | 100,000 | * |
| Option Opportunities Corp. ⁽³¹⁾ | 25,000 | * | 25,000 | - | - |
| Patrick Lorenz | 175,000 | * | 25,000 | 150,000 | * |
| Peter Janssen ⁽³²⁾ | 94,442 | * | 18,750 | 75,672 | * |
| Peter S Sabo | 175,000 | * | 25,000 | 150,000 | * |
| Plank 2010 Family Trust ⁽³³⁾ | 120,313 | * | 50,000 | 70,313 | * |
| Precedo Fund LP ⁽³⁴⁾ | 150,000 | * | 50,000 | 100,000 | * |
| RBC Capital Markets as Custodian for Barbara S. Dickler | 187,500 | * | 62,500 | 125,000 | * |
| RBC Custodian FBO Kevin Clarke IRA | 15,000 | * | 5,000 | 10,000 | * |
| RBC Custodian FBO Jonathan Young IRA | 15,000 | * | 5,000 | 10,000 | * |

| | | | | | |
|------------------------------------------------------------------------|-----------|------|---------|-----------|------|
| Robert deRose and Susan deRose Family Trust 11/18/86 ⁽³⁵⁾ | 300,000 | * | 100,000 | 200,000 | * |
| Robert H. Rowley and Dorothy W. Rowley Trust ⁽³⁶⁾ | 30,000 | * | 10,000 | 20,000 | * |
| Robert L. Consley | 75,000 | * | 25,000 | 50,000 | - |
| Robert L. Montgomery | 37,500 | * | 12,500 | 25,000 | * |
| Robyn Schreiber | 75,000 | * | 25,000 | 50,000 | * |
| Investor Company F.B.O. Rosalind Capital Partners L.P. ⁽³⁷⁾ | 419,350 | * | 93,750 | 325,600 | - |
| Investor Company F.B.O. Rosalind Master Fund L.P. ⁽³⁸⁾ | 230,650 | * | 56,250 | 174,400 | - |
| S.T. Organovo LLC ⁽³⁹⁾ | 750,000 | 1.3% | 250,000 | 500,000 | * |
| Safier Enterprises LLC ⁽⁴⁰⁾ | 50,000 | * | 50,000 | - | - |
| Samuel R Solis | 93,750 | * | 31,250 | 62,500 | * |
| Serenity Now LLC ⁽⁴¹⁾ | 92,500 | * | 12,500 | 80,000 | * |
| Seymore Goldstein and Danyale English | 75,000 | * | 25,000 | 50,000 | * |
| SJO Worldwide, LLC ⁽⁴²⁾ | 900,000 | 1.5% | 300,000 | 600,000 | 1.1% |
| Souheil Haddad | 1,037,500 | 1.8% | 12,500 | 1,025,000 | 1.8% |
| Stacy P. Paros | 93,750 | * | 31,250 | 62,500 | * |
| Steven C. Plank | 120,313 | * | 50,000 | 70,313 | * |
| Terrence Oi and Patricia McChan ⁽⁴³⁾ | 115,000 | * | 25,000 | 90,000 | * |
| The Robert G. Mulchrone Trust ⁽⁴⁴⁾ | 97,500 | * | 32,500 | 65,000 | * |
| The Wollheim Family Trust ⁽⁴⁵⁾ | 75,000 | * | 75,000 | - | - |
| Timothy J Prouty IRA Raymond James and Assoc. Inc. Custodian | 10,000 | * | 10,000 | - | - |
| Timothy McInerney | 37,500 | * | 12,500 | 25,000 | * |
| Vantage FBO Laurence E. Lof Roth IRA ⁽⁴⁶⁾ | 75,000 | * | 25,000 | 50,000 | * |
| Vantage FBO Regina M. MacLean Roth IRA | 37,500 | * | 12,500 | 25,000 | - |
| Vekoe Partners LLC ⁽⁴⁷⁾ | 67,500 | * | 22,500 | 45,000 | * |
| Vidonia Holdings, LLC ⁽⁴⁸⁾ | 240,625 | * | 100,000 | 140,625 | * |
| Wachtel Ventures, LLC ⁽⁴⁹⁾ | 240,626 | * | 100,000 | 140,626 | * |

| | | | | | |
|---------------------------------------------------------------------------------|-----------|-------|---------|-----------|-------|
| Warberg Opportunistic Trading Fund LP ⁽⁵⁰⁾ | 25,000 | * | 25,000 | - | - |
| William F. Miller, III | 225,000 | * | 75,000 | 150,000 | * |
| Wiltain Investors LLC ⁽⁵¹⁾ | 1,062,500 | 1.8% | 737,500 | 325,000 | * |
| 1010 Holdings LLC ⁽⁵²⁾ | 601,563 | 1.1% | 250,000 | 351,563 | * |
| SPH Investments Inc. Profit Sharing Plan FBO Stephen Harrington ⁽⁵³⁾ | 650,000 | 1.1% | 150,000 | 500,000 | * |
| Sherif Sidhom Salib ⁽⁵⁴⁾ | 635,000 | 1.1% | 135,000 | 500,000 | * |
| Northlea Partners, LLLP ⁽⁵⁵⁾ | 150,000 | * | 50,000 | 100,000 | * |
| NSH 2008 Family Trust ⁽⁵⁶⁾ | 150,000 | * | 50,000 | 100,000 | * |
| RBC Capital Markets FBO Laurence G. Allen IRA | 150,000 | * | 50,000 | 100,000 | * |
| ACP Partners, LP ⁽⁵⁷⁾ | 75,000 | * | 25,000 | 50,000 | * |
| ACP X, LP ⁽⁵⁸⁾ | 3,586,250 | 6.1% | 500,000 | 3,086,250 | 5.3% |
| George Karfunkel | 1,800,000 | 4.8% | 600,000 | 1,200,000 | * |
| Herbert J. Conrad ⁽⁵⁹⁾ | 3,783,208 | 6.4% | 875,000 | 2,908,208 | 5.0% |
| Jennifer Lorenzo | 75,000 | * | 75,000 | - | - |
| GJG Life Sciences LLC ⁽⁶⁰⁾ | 8,746,760 | 14.2% | 875,000 | 7,871,760 | 12.9% |
| Derek Sroufe | 261,500 | * | 87,500 | 174,000 | * |
| DIT Equity Investors, LLC ⁽⁶¹⁾ | 291,667 | * | 125,000 | 166,667 | * |
| Edward M. Dunn | 1,525,000 | 2.6% | 175,000 | 1,350,000 | 2.4% |
| BobCat Property Trust of Angel Fire, New Mexico ⁽⁶²⁾ | 1,350,000 | 2.3% | 250,000 | 1,100,000 | 1.9% |
| Bruce A. Ferguson IRA Raymond James and Assoc. Inc. Custodian | 15,000 | * | 15,000 | - | - |
| Bruce A. Ferguson and Dawn E. Gunter TIC | 45,000 | * | 15,000 | 30,000 | * |
| Griffin Value Investors LLC ⁽⁶³⁾ | 300,000 | * | 100,000 | 200,000 | * |

* Less than 1%.

⁽¹⁾ Share numbers include shares underlying warrants held by the selling stockholder.

- (2) Assumes the sale of all shares offered pursuant to this prospectus.
- (3) A. Lauren Rhude is a trustee with voting and dispositive power over the shares held by the A. Lauren Rhude Trust.
- (4) Avrom Balsam and Nathaniel Abramson are natural persons with voting and dispositive power over the shares held by ABBA Properties Partnership.
- (5) Ali Bijan Rafie is a trustee with voting and dispositive power over the shares held by the Ali Bijan Rafie Trust.
- (6) Steven Ellis is a natural person with voting and dispositive power over the shares held by Arnold Estates LLC.
- (7) Steven G. Martin is a natural person with voting and dispositive power over the shares held by Aspire Capital Fund LLC.
- (8) William Belzberg is a natural person with voting and dispositive power over the shares held by Bel-Cal Joint Venture.
- (9) Nancy J. Cooper and Nicholas Ponzio are natural persons with voting and dispositive power over the shares held by Blue Ridge Financial Inc.
- (10) Carl E. Berg and Carl Warden are co-trustees with voting and dispositive power over the shares held by the Clyde J. Berg 2011 Charitable Remainder Trust 2011.
- (11) Todd Van Emburgh is a natural person with voting and dispositive power over the shares held by Collier Holdings LLC.
- (12) Charles Raymond Langston is a trustee with voting and dispositive power over the shares held by The Langston Family Revocable Trust.
- (13) Dominion Pension Plan Trustees (Jersey) Limited is a trustee with voting and dispositive power over the shares held by the Raffaele Ricci Pension Trust. J.L. Piazza is a control person of Dominion Pension Plan Trustees (Jersey) Limited.
- (14) Robert Burke is a natural person with voting and dispositive power over the shares held by FourJr. Investments LTD.
- (15) Frederick B Carson and Barbara Kim Carson are co-trustees with voting and dispositive power over the shares held by the Carson Living Trust.
- (16) Gary J. McAdam is a trustee with voting and dispositive power over the shares held by the Growth Ventures, Inc. Pension Plan & Trust.

- (17) Jack Springer is a trustee with voting and dispositive power over the shares held by the Jack J. Springer, M.D., A Medical Corporation Defined Benefit Plan & Trust.
- (18) Jeffrey F. Schoenbaum and Susan M. Schoenbaum are co-trustees with voting and dispositive power over the shares held by the Jeffrey F. Schoenbaum Revocable Trust U/A 3/4/96.
- (19) Joshua S. Weiss is a natural person with voting and dispositive power over the shares held by JKW Family Ltd.
- (20) B. Ted Kosir and Stojka Kosir are trustees with voting and dispositive power over the shares held by the Kosir Living Trust.
- (21) Includes 75,000 share beneficially owned by Laura P. Dell individually.
- (22) Laurence G. Allen is a natural person with voting and dispositive power over the shares held by LGA Investments Family Limited Partnership, ACP Partners, LP and ACP X, LP.
- (23) Marvin Boehm is a trustee with voting and dispositive power over the shares held by the Marvin Boehm Family Trust.
- (24) Mary L. Marcus-West is a trustee with voting and dispositive power over the shares held by the Mary L. Marcus-West Declaration Trust.
- (25) Ralph Pastore is a natural person with voting and dispositive power over the shares held by MAT9 LLC and S.T. Organovo LLC.
- (26) Jonathan Blumberg is a natural person with voting and dispositive power over the shares held by M.J. Fil Investments LLC, Option Opportunities Corp., Serenity Now LLC, Warberg Opportunistic Trading Fund LP. Mr. Blumberg is affiliated with a FINRA Member firm.
- (27) Stephen Harrington is a natural person with voting and dispositive power over the shares held by Moggle Investors LLC.
- (28) Mr. Maher is a FINRA member.
- (29) Mr. Emad is a FINRA member.
- (30) Brooks McCartney is a natural person with voting and dispositive power over the shares held by Nickel River LLC. Nickel River LLC is affiliated with a FINRA-member broker-dealer.
- (31) Jonathan Blumberg is a natural person with voting and dispositive power over the shares held by M.J. Fil Investments LLC, Option Opportunities Corp., Serenity Now LLC, Warberg Opportunistic Trading Fund LP. Mr. Blumberg is affiliated with a FINRA Member Firm.
- (32) Mr. Janssen is a FINRA member broker-dealer.
- (33) Julie Plank is a trustee with voting and dispositive power over the shares held by the Plank 2010 Family Trust.
- (34) Timothy Moran is a natural person with voting and dispositive power over the shares held by Precedo Fund LP.

- (35) Robert D. DeRose is a trustee with voting and dispositive power over the shares held by the Robert deRose and Susan deRose Family Trust 11/18/86.
- (36) Robert H. Rowley and Dorothy W. Rowley are co-trustees with voting and dispositive power over the shares held by Robert H. Rowley and Dorothy W. Rowley Trust.
- (37) Steven Salamon is a natural person with voting and dispositive power over the shares held by Rosalind Capital Partners L.P. and Rosalind Master Fund L.P.
- (38) Steven Salamon is a natural person with voting and dispositive power over the shares held by Rosalind Capital Partners L.P. and Rosalind Master Fund L.P.
- (39) Ralph Pastore is a natural person with voting and dispositive power over the shares held by MAT9 LLC and S.T. Organovo LLC.
- (40) Jamie Safier is a natural person with voting and dispositive power over the shares held by Safier Enterprises LLC.
- (41) Daniel Warsh and Jonathan Blumberg each individually hold voting and dispositive power over the shares held by Serenity Now LLC. Mr. Blumberg and Mr. Warsh are each affiliated with a FINRA Member Firm.
- (42) Jeremy Office is a natural person with voting and dispositive power over the shares held by SJO Worldwide, LLC.
- (43) Includes 75,000 shares beneficially owned by Terrence Oi individually.
- (44) Robert G. Mulchrone is a trustee with voting and dispositive power over the shares held by the Robert G. Mulchrone Trust.
- (45) Bryan J. Wollheim and Jaclyn S. Wollheim are co-trustee with voting and dispositive power over the shares held by the Wollheim Family Trust.
- (46) Mr. Lof is a FINRA member.
- (47) Jan Koe is a natural person with voting and dispositive power over the shares held by Vekoe Partners LLC.
- (48) Tara Keiter is a natural person with voting and dispositive power over the shares held by Vidonia Holdings, LLC.
- (49) Adam Wachtel is a natural person with voting and dispositive power over the shares held by Wachtel Ventures, LLC.
- (50) Jonathan Blumberg is a natural person with voting and dispositive power over the shares held by M.J. Fil Investments LLC, Option Opportunities Corp., Serenity Now LLC, Warberg Opportunistic Trading Fund LP. Mr. Blumberg is affiliated with a FINRA Member Firm.
- (51) John McCarthy is a natural person with voting and dispositive power over the shares held by Wiltain Investors LLC.
- (52) Stefano Ferrari is a natural person with voting and dispositive power over the shares held by 1010 Holdings LLC.

- (53) Includes 450,000 shares beneficially owned by SPH Investments Inc. Profit Sharing plan FBO Stephen Harrington, and 200,000 shares beneficially owned by SPH Investments, Inc. Stephen Harrington is a natural person with voting and dispositive power over the shares held by SPH Investments Inc. Profit Sharing Plan FBO Stephen Harrington and the shares held by SPH Investments, Inc.
- (54) Share numbers include shares of common stock that are registered in the name of Mr. Salib's individual retirement account.
- (55) John H Abeles is a natural person with voting and dispositive power over the shares held by Northlea Partners, LLLP.
- (56) David Hochman, Cynthia Hochman and Sara Hochman Allard are co-trustees with voting and dispositive power over the shares held by the NSH 2008 Family Trust.
- (57) Laurence G. Allen is a natural person with voting and dispositive power over the shares held by ACP Partners, LP, ACP X, LP and LGA Investments Family Limited Partnership.
- (58) Laurence G. Allen is a natural person with voting and dispositive power over the shares held by ACP Partners, LP, ACP X, LP and LGA Investments Family Limited Partnership.
- (59) Share numbers include shares of common stock issuable upon exercise of options that are exercisable within sixty days of March 1, 2015.
- (60) Jennifer Lorenzo is a natural person with voting and dispositive power over the shares held by GJG Life Sciences LLC.
- (61) Howard Appel is a natural person with voting and dispositive power over the shares held by DIT Equity Investors, LLC.
- (62) Theresa O'Brien is a trustee with voting and dispositive power over the shares held by the BobCat Property Trust of Angel Fire, New Mexico.
- (63) Ernest Bartlett is a natural person with voting and dispositive power over the shares held by Griffin Value Investors LLC.

PLAN OF DISTRIBUTION

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

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

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- privately negotiated transactions;
- short sales;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus; provided, however, that prior to any such transfer the following information (or such other information as may be required by the federal securities laws from time to time) with respect to each such selling beneficial owner must be added to the prospectus by way of a prospectus supplement or post-effective amendment, as appropriate: (1) the name of the selling beneficial owner; (2) any material relationship the selling beneficial owner has had within the past three years with us or any of our predecessors or affiliates; (3) the amount of securities of the class owned by such beneficial owner before the offering; (4) the amount to be offered for the beneficial owner's account; and (5) the amount and (if one percent or more) the percentage of the class to be owned by such beneficial owner after the offering is complete.

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

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

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

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

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

The maximum amount of compensation to be received by any FINRA member or independent broker-dealer for the sale of any securities registered under this prospectus will not be greater than 8.0% of the gross proceeds from the sale of such securities.

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

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

LEGAL MATTERS

The validity of the securities offered in this prospectus is being passed upon for us by Lowenstein Sandler LLP, New York, New York. Partners of the firm beneficially own an aggregate of 100,000 shares, warrants to purchase 25,000 shares of our common stock with an exercise price of \$2.00 per share, and warrants to purchase 50,000 shares of our common stock with an exercise price of \$0.75 per share.

EXPERTS

The consolidated financial statements of Matinas BioPharma Holdings, Inc. incorporated into this prospectus and related registration statement by reference to the Annual Report on Form 10-K for the year ended December 31, 2014 have been audited by EisnerAmper LLP, an independent registered public accounting firm, as set forth in their report (which includes an explanatory paragraph relating to the Company's ability to continue as a going concern as discussed in Note B to the financial statements) thereon and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act, with respect to the common stock offered by this prospectus. This prospectus, which is part of the registration statement, omits certain information, exhibits, schedules and undertakings set forth in the registration statement and the exhibits and schedules filed therewith. For further information pertaining to us and our common stock, reference is made to the registration statement and the exhibits and schedules to the registration statement. Statements contained in this prospectus as to the contents or provisions of any documents referred to in this prospectus are not necessarily complete, and in each instance where a copy of such document has been filed as an exhibit to the registration statement, reference is made to the exhibit for a more complete description of the matters involved.

You may read all or any portion of the registration statement and the exhibits and schedules filed therewith without charge at the office of the SEC at the Public Reference Room, 100 F Street, N.E., Room 1580 Washington, D.C. 20549. Copies of the registration statement may be obtained from such office. Please call the SEC at 1-800-SEC-0330 for further information about the Public Reference Room. In addition, registration statements and certain other filings made with the SEC electronically are publicly available through the SEC's web site at <http://www.sec.gov>. The registration statement, including all exhibits and amendments to the registration statement, has been filed electronically with the SEC.

Contemporaneously with the effectiveness of the registration statement of which this prospectus is a part, we will become subject to the information and periodic reporting requirements of the Exchange Act and, accordingly, will file annual reports containing financial statements audited by an independent public accounting firm, quarterly reports containing unaudited financial data, current reports, and other information with the Securities and Exchange Commission. You will be able to inspect and copy such periodic reports, and other information at the SEC's public reference room, and from the web site of the SEC referred to above.

DOCUMENTS INCORPORATED BY REFERENCE

The SEC allows us to "incorporate by reference" information into this document. This means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is considered to be a part of this document, except for any information superseded by information that is included directly in this document or incorporated by reference subsequent to the date of this document.

This prospectus incorporates by reference the documents listed below:

- our Annual Report on Form 10-K for the year ended December 31, 2014, filed with the SEC on March 31, 2015; and
- our Current Reports on Form 8-K filed with the SEC on January 30, 2015, February 2, 2015, March 18, 2015, March 19, 2015, April 6, 2015 and April 10, 2015 (other than any portions thereof deemed furnished and not filed).

You should rely only on the information incorporated by reference or provided in this prospectus. We have not authorized anyone to provide you with different information. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front of this document. Any statement contained in a document incorporated in this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus modifies or supersedes that statement. Any statement that is modified or superseded will not constitute a part of this prospectus, except as modified or superseded.

You may request a copy of these filings, at no cost, by writing or calling us at the following:

Matinas BioPharma Holdings, Inc.
1545 Route 206 South
Suite 302
Bedminster, NJ 07921 US
Attn: Corporate Secretary

Copies of the documents incorporated by reference may also be found on our website at www.matinasbiopharma.com. Except with respect to the documents expressly incorporated by reference above which are accessible at our website, the information contained on our website is not a part of, and should not be construed as being incorporated by reference into, this prospectus.

MATINAS BIOPHARMA HOLDINGS, INC.

**10,382,500 Shares
Common Stock**

PROSPECTUS

May 8, 2015