

MEDICINOVA INC
Form 424B5
May 22, 2015
Table of Contents

Filed Pursuant to Rule 424(b)(5)
Registration No. 333-185022

PROSPECTUS SUPPLEMENT

(to the Prospectus dated December 3, 2012)

MEDICINOVA, INC.

\$30,000,000

Common Stock

We have entered into an at-the-market issuance sales agreement, or sales agreement, with MLV & Co. LLC, or MLV, relating to shares of our common stock offered by this prospectus supplement and the accompanying prospectus. In accordance with the terms of the sales agreement, subject to effectiveness of the registration statement of which this prospectus is a part, we may offer and sell shares of our common stock, \$0.001 par value per share, having an aggregate offering price of up to \$30,000,000 from time to time to and/or through MLV.

Our common stock is listed on The NASDAQ Global Market under the symbol `MNOV` and on the Jasdaq Market of the Tokyo Securities Exchange under the code `4875`. The last reported sale price of our common stock on The NASDAQ Global Market on May 21, 2015 was \$4.00 per share.

Sales of our common stock, if any, under this prospectus supplement and the accompanying prospectus may be made in sales deemed to be at-the-market equity offerings as defined in Rule 415 promulgated under the Securities Act of 1933, as amended (the Securities Act), including sales made directly on or through The NASDAQ Global Market, the existing trading market for our common stock, sales made to or through a market maker other than on an exchange or otherwise, in negotiated transactions at market prices prevailing at the time of sale or at prices related to such prevailing market prices and/or any other method permitted by law. MLV will act as a sales agent on a best efforts basis using commercially reasonable efforts consistent with its normal trading and sales practices, on mutually agreed terms between MLV and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The compensation to MLV for sales of common stock sold pursuant to the sales agreement will be up to 4% of the gross proceeds from each sale. We have also agreed to reimburse MLV for certain of its expenses. In connection with the sale of the common stock on our behalf, MLV will be deemed to be an underwriter within the meaning of the Securities Act, and the compensation of MLV will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to MLV with respect to certain liabilities, including liabilities under the Securities Act. See Plan of Distribution for more information about these arrangements.

Before buying shares of our common stock, you should carefully consider the risk factors described in Risk Factors beginning on page S-4 of this prospectus supplement.

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

The date of this prospectus supplement is May 22, 2015.

Table of Contents

TABLE OF CONTENTS

| | Page |
|--|-------------|
| Supplemental Prospectus | |
| <u>ABOUT THIS PROSPECTUS SUPPLEMENT</u> | S-ii |
| <u>PROSPECTUS SUPPLEMENT SUMMARY</u> | S-1 |
| <u>THE OFFERING</u> | S-3 |
| <u>RISK FACTORS</u> | S-4 |
| <u>FORWARD-LOOKING STATEMENTS</u> | S-5 |
| <u>USE OF PROCEEDS</u> | S-7 |
| <u>DILUTION</u> | S-8 |
| <u>PRICE RANGE OF COMMON STOCK</u> | S-9 |
| <u>DIVIDEND POLICY</u> | S-9 |
| <u>PLAN OF DISTRIBUTION</u> | S-10 |
| <u>LEGAL MATTERS</u> | S-11 |
| <u>EXPERTS</u> | S-11 |
| <u>WHERE YOU CAN FIND MORE INFORMATION</u> | S-11 |
| <u>INFORMATION INCORPORATED BY REFERENCE</u> | S-12 |
| Prospectus | |
| <u>ABOUT THIS PROSPECTUS</u> | ii |
| <u>SUMMARY</u> | 1 |
| <u>RISK FACTORS</u> | 5 |
| <u>FORWARD-LOOKING STATEMENTS</u> | 7 |
| <u>RATIOS OF EARNINGS TO FIXED CHARGES</u> | 9 |
| <u>USE OF PROCEEDS</u> | 9 |
| <u>SELECTED FINANCIAL DATA</u> | 9 |
| <u>DESCRIPTION OF COMMON STOCK</u> | 10 |
| <u>DESCRIPTION OF PREFERRED STOCK</u> | 12 |
| <u>DESCRIPTION OF WARRANTS</u> | 14 |
| <u>DESCRIPTION OF DEBT SECURITIES</u> | 16 |
| <u>LEGAL OWNERSHIP OF SECURITIES</u> | 23 |
| <u>PLAN OF DISTRIBUTION</u> | 26 |

| | |
|--|----|
| <u>LEGAL MATTERS</u> | 28 |
| <u>EXPERTS</u> | 28 |
| <u>INCORPORATION BY REFERENCE</u> | 28 |
| <u>WHERE YOU CAN FIND MORE INFORMATION</u> | 29 |

S-i

Table of Contents

ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is the prospectus supplement, including the documents incorporated by reference, which describes the specific terms of this offering. The second part, the accompanying prospectus, including the documents incorporated by reference, provides more general information. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. We urge you to carefully read this prospectus supplement and the accompanying prospectus, and the documents incorporated herein and therein, before buying any of the securities being offered under this prospectus supplement. This prospectus supplement may add to, update or change information contained in the accompanying prospectus. To the extent that any statement that we make in this prospectus supplement is inconsistent with statements made in the accompanying prospectus or any documents incorporated by reference therein, the statements made in this prospectus supplement will be deemed to modify or supersede those made in the accompanying prospectus and such documents incorporated by reference therein. You should also read and consider the information contained in the documents identified under the headings **Incorporation of Certain Documents by Reference** and **Where You Can Find More Information**.

You should rely only on the information contained in, or incorporated by reference into, this prospectus supplement, and the accompanying prospectus. We have not authorized anyone to provide you with different information. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus supplement and the accompanying prospectus. You should not rely on any unauthorized information or representation. This prospectus supplement is an offer to sell only the securities offered hereby, and only under circumstances and in jurisdictions where it is lawful to do so. You should assume that the information in this prospectus supplement and the accompanying prospectus is accurate only as of the date on the front of the applicable document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus supplement or the accompanying prospectus, or any sale of a security.

This prospectus supplement, the accompanying prospectus, and the information incorporated herein and therein by reference includes trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement or the accompanying prospectus are the property of their respective owners.

All references in this prospectus supplement and the accompanying prospectus to **MediciNova**, the **Company**, **we**, **us**, **our**, or similar references refer to **MediciNova, Inc.** and its subsidiaries on a consolidated basis, except where the context otherwise requires or as otherwise indicated.

Table of Contents

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information contained elsewhere in or incorporated by reference into this prospectus supplement. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. For a more complete understanding of our company and this offering, we encourage you to read and consider carefully the more detailed information in this prospectus supplement and the accompanying prospectus, including the information incorporated by reference into this prospectus supplement and the accompanying prospectus, and the information included in any free writing prospectus that we have authorized for use in connection with this offering. If you invest in our securities, you are assuming a high degree of risk. See Risk Factors.

About MediciNova, Inc.

Our Business

We are a biopharmaceutical company focused on acquiring and developing novel, small molecule therapeutics for the treatment of serious diseases with unmet medical needs and a commercial focus on the U.S. market. Our current strategy is to focus our development activities on MN-166 (ibudilast) for neurological disorders such as progressive multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS) and substance dependence (e.g., methamphetamine dependence, opioid dependence, and alcohol dependence), and MN-001 (tipelukast) for fibrotic diseases such as nonalcoholic steatohepatitis (NASH) and idiopathic pulmonary fibrosis (IPF). Our pipeline also includes MN-221 (bedoradrine) for the treatment of acute exacerbation of asthma and MN-029 (denibulin) for solid tumor cancers.

MN-166 (ibudilast) is currently in development for several different neurological disorders. We completed a Phase 2 clinical trial of MN-166 for the treatment of multiple sclerosis (MS) in 2008, in which positive safety and neuroprotective efficacy indicators were observed. We have successfully partnered with investigators on an ongoing Phase 2b clinical trial of MN-166 in primary progressive and secondary progressive MS which is conducted by NeuroNEXT and funded by the NIH's National Institute on Neurological Diseases and Stroke (NINDS). In May 2015, we announced that the MN-166 trial is now fully enrolled. In August 2014, we announced plans to initiate a clinical trial of MN-166 in amyotrophic lateral sclerosis (ALS), and this trial is currently ongoing. In February 2015, we announced that the ALS study had enrolled 30 of the 60 subjects planned for participation, and in April 2015, we announced that an independent safety medical monitor had completed an interim safety review of the first 21 subjects enrolled in the study and found there were no safety or tolerability concerns in the treatment group compared with the placebo treatment group after three months of treatment. Based on the findings from the interim safety review, the study is continuing as planned. In the area of addiction, investigators at the University of California, Los Angeles (UCLA) completed a Phase 1b clinical trial of MN-166 in methamphetamine (MA)-dependent volunteers, funded by the National Institute on Drug Abuse (NIDA), and the results were presented at the Annual Meeting of the College on Problems of Drug Dependence (CPDD) in June 2013. In September 2012, we announced approval and funding by NIDA of a Phase 2 clinical trial studying the use of MN-166 for the treatment of MA addiction. In collaboration with UCLA, this clinical trial commenced in 2013 and is currently ongoing. In 2010, investigators at Columbia University and the New York State Psychiatric Institute (NYSPI) completed a Phase 1b/2a clinical trial of MN-166 in opioid withdrawal that was funded by NIDA. Investigators at Columbia University and the NYSPI are currently conducting a NIDA-funded, Phase 2a clinical trial to evaluate the efficacy of MN-166 in the treatment of patients addicted to prescription opioids or heroin. Positive interim data from this study was reported in August 2014. In August 2013, we announced that researchers at UCLA were granted approval and funding by National Institute on Alcoholism and Alcohol Abuse (NIAAA) of a clinical trial studying the use of MN-166 for the treatment of alcohol dependence, and the study is currently ongoing.

S-1

Table of Contents

MN-001 (tipelukast) is currently in development for fibrotic diseases such as nonalcoholic steatohepatitis (NASH) and idiopathic pulmonary fibrosis (IPF). In 2014, we announced positive results of MN-001 in two different NASH mouse models and began preparing for clinical development of MN-001 for the treatment of NASH in the U.S. In January 2015, we announced that the IND (Investigation New Drug) application for MN-001 for the treatment of NASH is open with the FDA (U.S. Food and Drug Administration) and the FDA agreed that we may proceed with a Phase 2 study. In April 2015, we announced that the FDA has granted Fast Track Designation for MN-001 for the treatment of NASH with fibrosis. Fast Track is a process designed to facilitate the development and expedite the review of drugs that are intended to treat serious or life-threatening diseases and demonstrate the potential to address unmet medical needs for such diseases. An important feature of the FDA's Fast Track program is that it emphasizes frequent communication between the FDA and the sponsor throughout the entire drug development and review process to improve the efficiency of product development. In June 2014, we announced positive results of MN-001 in a mouse model of pulmonary fibrosis and have begun preparations to pursue clinical development of MN-001 in IPF. In October 2014, we announced that the FDA granted Orphan-Drug designation to MN-001 for treatment of IPF, which will provide seven years of marketing exclusivity if MN-001 is approved for IPF. In February 2015, we announced that FDA has approved the protocol for a clinical trial of MN-001 (tipelukast) for the treatment of moderate to severe IPF. Importantly, due to safety data from previous clinical studies of MN-001, FDA has agreed that we may proceed with a Phase 2 study as the first clinical trial of MN-001 in IPF.

We completed a Phase 2 clinical trial of MN-221 (bedoradrine) for the treatment of acute exacerbations of asthma treated in the emergency room and conducted an End-of-Phase 2 (EOP2) meeting with the FDA in October 2012. We plan to conduct further MN-221 development according to the feedback received from the FDA following the EOP2 meeting. In that meeting, the FDA identified the risk/benefit profile of MN-221 as a focal point for further development and advised that a clinical outcome, such as a reduction in hospitalizations, would need to be a pivotal trial primary endpoint. Previously completed Phase 2 studies have evaluated the potential for MN-221 to reduce hospitalizations due to acute exacerbations of asthma. We believe the appropriate clinical development for MN-221 will involve conducting dose regimen and acute exacerbations of asthma trial design optimization studies prior to commencing pivotal trials. Currently, we are working to identify a partner for financial support before further clinical development is commenced.

We have acquired licenses to MN-166, MN-001, MN-221, and MN-029 for the development of these product candidates. We have pursued development of these product candidates in various indications including progressive MS, ALS, various addictions, NASH, IPF, acute exacerbations of asthma and solid tumor cancers.

Company Information

We were incorporated in the State of Delaware in September 2000. Our principal executive offices are located at 4275 Executive Square, Suite 650, La Jolla, CA 92037. Our telephone number is (858) 373-1500. Our website is www.medicinova.com, which includes links to reports we have filed with the Securities and Exchange Commission, or SEC. The information contained in, or that can be accessed through, our website is not part of, and is not incorporated into, this prospectus supplement or the accompanying prospectus and should not be considered part of this prospectus supplement or the accompanying prospectus.

Table of Contents

THE OFFERING

Common stock offered by us pursuant to this prospectus supplement Shares having an aggregate offering price of up to \$30,000,000.

Common stock to be outstanding after this offering Up to 32,137,921 shares, assuming the sale of 7,500,000 shares of our common stock in this offering at an offering price of \$4.00 per share, which was the last reported sale price of our common stock on The NASDAQ Global Market on May 21, 2015. The actual number of shares issued will vary depending on the actual sales prices under this offering.

Manner of offering At-the-market offering that may be made from time to time through MLV & Co. LLC. See Plan of Distribution on page S-10.

Use of proceeds We intend to use the net proceeds from this offering to fund our research and development efforts, and for general corporate purposes, including working capital and other general and administrative purposes. See Use of Proceeds on page S-7.

NASDAQ Global Market symbol MNOV

Tokyo Securities Exchange code 4875

Risk factors This investment involves a high degree of risk. See Risk Factors beginning on page S-4 of this prospectus supplement as well as the other information included in or incorporated by reference in this prospectus supplement and the accompanying prospectus for a discussion of factors you should consider carefully before making an investment decision.

The number of shares of our common stock shown above to be outstanding immediately after this offering is based on 24,637,921 shares outstanding as of March 31, 2015 and excludes as of such date:

4,096,969 shares of common stock reserved for the exercise of options outstanding at a weighted average exercise price of \$4.70;

1,710,825 shares of common stock reserved for future issuance under our stock incentive plan;

3,658,567 shares of common stock reserved for the exercise of warrants outstanding at a weighted-average exercise price of \$3.60;

209,349 shares of common stock reserved for future issuance under our employee stock purchase plan; and

2,200,000 shares of common stock reserved for the conversion of shares of Series B Convertible Preferred Stock.

S-3

Table of Contents

RISK FACTORS

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described below and those under the heading "Risk Factors" contained in our most recent annual report on Form 10-K and our quarterly reports on Form 10-Q, which have been filed with the SEC and are incorporated by reference in this prospectus, as well as any updates thereto contained in subsequent filings with the SEC or any applicable prospectus supplement or free writing prospectus, before deciding whether to purchase any of the securities being registered pursuant to the registration statement of which this prospectus is a part. Each of the risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities, and the occurrence of any of these risks might cause you to lose all or a part of your investment. Moreover, the risks described are not the only risks that we face. Additional risks not presently known to us or that we currently believe are immaterial may also significantly impair our business operations.

Risks Related to this Offering

Sales of our common stock in this offering, or the perception that such sales may occur, could cause the market price of our common stock to fall.

We may issue and sell shares of our common stock for aggregate gross proceeds of up to \$30,000,000 from time to time in connection with this offering. The issuance and sale from time to time of these new shares of common stock, or our ability to issue these new shares of common stock in this offering, could have the effect of depressing the market price of our common stock.

Our management team will have broad discretion over the use of the net proceeds from this offering.

Our management will use its discretion to direct the net proceeds from this offering. We intend to use all of the net proceeds, together with cash on hand, for research and development and general corporate purposes. General corporate purposes may include working capital, capital expenditures, development costs, strategic investments or possible acquisitions. Our management's judgments may not result in positive returns on your investment and you will not have an opportunity to evaluate the economic, financial or other information upon which our management bases its decisions.

If you purchase the common stock sold in this offering, you will experience immediate dilution in your investment. You may experience further dilution if we issue additional equity securities in future fundraising transactions.

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Assuming we sell 7,500,000 shares in this offering at an assumed offering price of \$4.00 per share, and after deducting the estimated offering expenses payable by us in this offering, you will experience immediate dilution of \$2.905 per share, representing the difference between our as adjusted net tangible book value per share as of March 31, 2015 after giving effect to this offering and the assumed offering price. The exercise of outstanding stock options and warrants may result in further dilution of your investment. See the section entitled "Dilution" below for a more detailed illustration of the dilution you would incur if you participate in this offering.

We do not anticipate declaring any cash dividends on our common stock. Investors in this offering may never obtain a return on their investment.

We have never declared or paid cash dividends on our common stock and do not plan to pay any cash dividends in the foreseeable future. Our current policy is to retain all funds and earnings for use in the operation and expansion of our business. As a result, capital appreciation, if any, of our common stock will be the sole source of gain for the foreseeable future for holders of our common stock.

S-4

Table of Contents

FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering contain forward-looking statements within the meaning of Section 27A of the Securities Act, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to, statements about:

the potential for our product candidates to receive regulatory approval for one or more indications on a timely basis, or at all;

the success, timing, design and results of clinical trials for our product candidates, including any delays in commencing or completing enrollment for our ongoing or planned clinical trials;

plans for future clinical trials and regulatory submissions;

unexpected adverse side effects or inadequate therapeutic efficacy of our product candidates that could delay or prevent regulatory approval or commercialization or that could result in product liability claims;

other difficulties or delays in development, testing, manufacturing and marketing of and obtaining regulatory approval for our product candidates;

the continuation and success of our collaborations with our licensors;

the performance of third party service providers and manufacturers;

intellectual property rights and disputes, including the scope and validity of patent protection for our product candidates;

the size and growth of the potential markets for our product candidates and our ability to serve those markets;

the potential to attract one or more strategic partners and terms of any related transactions;

intense competition and our ability to compete if any of our product candidates are ever commercialized;

regulatory developments in the United States and foreign countries;

the potential impact of uncertainties in the credit and capital markets or a future deterioration of these markets on our investment portfolio; and

our ability to raise sufficient capital when needed, or at all.

In some cases, you can identify forward-looking statements by terms such as may, will, should, could, would, plans, anticipates, believes, estimates, projects, predicts, potential and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading Risk Factors contained in this prospectus supplement and in our SEC filings. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statements.

Table of Contents

You should read this prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

You should rely only on the information contained, or incorporated by reference, in this prospectus supplement, the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering. We have not authorized anyone to provide you with different information. The securities offered under this prospectus are not being offered in any state where the offer is not permitted. You should not assume that the information contained in this prospectus supplement or the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering is accurate as of any date other than the date on the front of this prospectus supplement or the accompanying prospectus, as applicable, or that any information incorporated by reference in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date of the document so incorporated by reference. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

Table of Contents

USE OF PROCEEDS

We intend to use the net proceeds from the sale of the securities under this prospectus supplement to fund our research and development efforts, and for general corporate purposes, including working capital. Specifically, we intend to use a portion of such net proceeds to fund development work for research and development on MN-166 (ibudilast) and MN-001 (tipelukast). We may also use a portion of the net proceeds to acquire or invest in complementary businesses, technologies, product candidates or other intellectual property, although we have no present commitments or agreements to do so.

The amounts and timing of these expenditures will depend on a number of factors, such as the timing and progress of our research and development efforts, technological advances and the competitive environment for our product candidates. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, we will retain broad discretion over the use of these proceeds. Pending use of the net proceeds as described above, we intend to temporarily invest the proceeds in short and long-term interest bearing instruments. Pending application of the net proceeds as described above, we expect to invest the net proceeds in short-term, investment-grade securities.

S-7

Table of Contents**DILUTION**

Our net tangible book value as of March 31, 2015 was \$6,546,090, or \$0.266 per share of common stock. Net tangible book value per share is calculated by subtracting our total liabilities from our total tangible assets, which is total assets less intangible assets, and dividing this amount by the number of shares of common stock outstanding. After giving effect to the sale of our common stock in the aggregate amount of \$30,000,000 at an assumed offering price of \$4.00 per share, the last reported sale price of our common stock on The NASDAQ Global Market on May 21, 2015, and after deducting estimated offering commissions and expenses payable by us, our net tangible book value as of March 31, 2015 would have been \$35,176,090, or \$1.095 per share of common stock. This represents an immediate increase in the net tangible book value of \$0.829 per share to our existing stockholders and an immediate and substantial dilution in net tangible book value of \$2.905 per share to new investors. The following table illustrates this per share dilution:

| | |
|---|----------|
| Assumed offering price per share | \$ 4.000 |
| Net tangible book value per share as of March 31, 2015 | \$ 0.266 |
| Increase per share attributable to new investors | \$ 0.829 |
| As-adjusted net tangible book value per share after this offering | \$ 1.095 |
| Net dilution per share to new investors | \$ 2.905 |

The table above assumes for illustrative purposes that an aggregate of 7,500,000 shares of our common stock are sold at a price of \$4.00 per share, the last reported sale price of our common stock on The NASDAQ Global Market on May 21, 2015, for aggregate gross proceeds of \$30,000,000. The shares sold in this offering, if any, will be sold from time to time at various prices. An increase of \$0.25 per share in the price at which the shares are sold from the assumed offering price of \$4.00 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$30,000,000 is sold at that price, would not impact our adjusted net tangible book value; however, the adjusted net tangible book value per share after the offering would increase by \$0.015 per share due to the decrease in shares sold in the offering to 7,058,823 and would increase the dilution in net tangible book value per share to new investors in this offering to \$3.140 per share, after deducting commissions and estimated aggregate offering expenses payable by us. A decrease of \$0.25 per share in the price at which the shares are sold from the assumed offering price of \$4.00 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$30,000,000 is sold at that price, would not impact our adjusted net tangible book value; however, the adjusted net tangible book value per share after the offering would decrease by \$0.017 per share due to the increase in shares sold in the offering to 8,000,000 and would decrease the dilution in net tangible book value per share to new investors in this offering to \$2.672 per share, after deducting commissions and estimated aggregate offering expenses payable by us. This information is supplied for illustrative purposes only.

The calculations above are based upon 24,637,921 shares of common stock outstanding as of March 31, 2015 and exclude:

4,096,969 shares of common stock reserved for the exercise of options outstanding at a weighted average exercise price of \$4.70;

1,710,825 shares of common stock reserved for future issuance under our stock incentive plan;

3,658,567 shares of common stock reserved for the exercise of warrants outstanding at a weighted-average exercise price of \$3.60;

209,349 shares of common stock reserved for future issuance under our employee stock purchase plan; and

2,200,000 shares of common stock reserved for the conversion of shares of Series B Convertible Preferred Stock.

S-8

Table of Contents

Subsequent to March, 31, 2015, we issued an aggregate of 242,500 shares of common stock, consisting of 45,000 shares sold under our prior at-the-market offering program and 197,500 shares issued pursuant to the exercise of warrants.

PRICE RANGE OF COMMON STOCK

Since December 7, 2006, our common stock has been listed on The NASDAQ Global Market under the symbol MNOV. Prior to that time there was no public market for our stock. The following table lists quarterly information on the price range of our common stock based on the high and low reported sale prices for our common stock as reported by The NASDAQ Global Market for the periods indicated below, respectively.

| | High | Low |
|------------------------|---------|---------|
| 2013 | | |
| First Quarter | \$ 3.67 | \$ 1.53 |
| Second Quarter | 4.70 | 2.26 |
| Third Quarter | 2.76 | 2.25 |
| Fourth Quarter | 3.10 | 1.91 |
| 2014 | | |
| First Quarter | \$ 5.25 | \$ 1.99 |
| Second Quarter | 2.25 | 1.66 |
| Third Quarter | 3.38 | 1.86 |
| Fourth Quarter | 4.80 | 2.82 |
| 2015 | | |
| First Quarter | \$ 4.25 | \$ 3.03 |
| Second Quarter to date | 5.90 | 3.33 |

On May 21, 2015, the last reported sale price of our common stock on The NASDAQ Global Market was \$4.00 per share. As of such date, there were approximately 8,400 holders of record of our common stock.

DIVIDEND POLICY

We have never declared or paid dividends on our common stock. We currently expect to retain future earnings, if any, for use in the operation and expansion of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay dividends on our common stock is subject to the discretion of our Board of Directors and will depend upon various factors, including, without limitation, our results of operations and financial condition.

Table of Contents

PLAN OF DISTRIBUTION

We have entered into an at-the-market issuance sales agreement, or sales agreement, with MLV & Co. LLC, or MLV, under which we may issue and sell shares of our common stock having aggregate sales proceeds of up to \$30,000,000 from time to time through MLV, which will act as our sales agent. MLV may sell the common stock by any method that is deemed to be an at-the-market offering as defined in Rule 415 promulgated under the Securities Act, including sales made directly on or through The NASDAQ Stock Market LLC or any other existing trading market for the common stock or to or through a market maker. MLV may also sell the common stock in negotiated transactions, subject to our prior approval.

Each time we wish to issue and sell common stock under the sales agreement, we will notify MLV of the number of shares to be issued, the dates on which such sales are anticipated to be made, and any minimum price below which sales may not be made. Once we have so instructed MLV, unless MLV declines to accept the terms of such notice, MLV has agreed to use its commercially reasonable efforts consistent with its normal trading and sales practices to sell such shares up to the amount specified on such terms. The obligations of MLV under the sales agreement to sell our common stock are subject to a number of customary conditions that we must meet.

Settlement for shares of our common stock will occur on the third trading day following the date on which the sale was made. Sales of our common stock as contemplated in this prospectus supplement will be settled through the facilities of The Depository Trust Company or by such other means as we and MLV may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

We will pay MLV a commission of up to 4% of the gross proceeds from each sale. We also agreed to reimburse MLV for its legal expenses up to \$25,000 in the aggregate. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. In connection with the sale of the common stock on our behalf, MLV will be deemed to be an underwriter within the meaning of the Securities Act as amended, and the compensation of MLV will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to MLV with respect to certain civil liabilities, including liabilities under the Securities Act. We estimate that the total expenses for the offering, excluding compensation payable to MLV under the terms of the sales agreement, will be up to approximately \$170,000.

The offering of our common stock pursuant to the sales agreement will terminate upon the earlier of (i) the sale of all of our common stock provided for in this prospectus supplement, or (ii) the termination of the sales agreement as permitted therein.

This summary of the material provisions of the sales agreement does not purport to be a complete statement of its terms and conditions. A copy of the sales agreement is filed with the SEC and is incorporated by reference into the registration statement of which this prospectus supplement is a part. See [Where You Can Find More Information](#) below.

To the extent required by Regulation M under the Exchange Act, MLV will not engage in any market making activities involving our common stock while the offering is ongoing under this prospectus.

MLV and its affiliates may in the future provide various investment banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees.

In addition, the sales agreement provides that we will not (i) take any action designed to cause or result in, or that constitutes or would reasonably be expected to constitute, the stabilization or manipulation of the price of any of our securities to facilitate the sale or resale of common stock, (ii) sell, bid for, or purchase common stock in violation of Regulation M, or pay anyone any compensation for soliciting purchases of the common stock under the sales agreement other than MLV or (iii) engage in solicitations of sales in Japan in a manner that would not be exempt from registration or qualification requirements of the offering regulations under Japanese securities laws.

S-10

Table of Contents

LEGAL MATTERS

The validity of the common stock offered by this prospectus supplement and the accompanying prospectus will be passed upon for us by Pillsbury Winthrop Shaw Pittman LLP, San Diego, California. Certain legal matters will be passed upon for MLV & Co. LLC by K&L Gates LLP, Orange County, California.

EXPERTS

The consolidated financial statements of MediciNova, Inc. appearing in MediciNova, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2014, and the effectiveness of MediciNova, Inc.'s internal control over financial reporting as of December 31, 2014, have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus supplement and the accompanying prospectus are part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and do not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus supplement or the accompanying prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference into this prospectus supplement and the accompanying prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, we file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at www.sec.gov. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room.

Table of Contents

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to incorporate by reference information from other documents that we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement and the accompanying prospectus. Information contained in this prospectus supplement and the accompanying prospectus and information that we file with the SEC in the future and incorporate by reference into this prospectus supplement and the accompanying prospectus will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings (other than Current Reports on Form 8-K furnished under Item 2.02 or Item 7.01 and exhibits filed on such form that are related to such items) we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement and before the sale of all the securities covered by this prospectus supplement:

our Annual Report on Form 10-K for the year ended December 31, 2014 (filed on March 12, 2015);

our Quarterly Report on Form 10-Q for the quarter ended March 31, 2015 (filed on May 11, 2015);

our Current Reports on Form 8-K filed with the SEC on April 3, 2015, April 29, 2015 and May 22, 2015 (other than the portions of any of these reports furnished but not filed pursuant to SEC rules and the exhibits filed on such form that relate to such portions);

the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2014 from our definitive proxy statement on Schedule 14A, filed with the SEC on April 29, 2015; and

the description of our common stock contained in our registration statement on Form S-3, filed with the SEC on November 16, 2012, including any amendment or reports filed for the purpose of updating such description (Registration No. 333-185022).

You can request a copy of these filings, at no cost, by writing or telephoning us at the following address or telephone number:

MediciNova, Inc.

4275 Executive Square, Suite 650

San Diego, CA 92037

(858) 373-1500

Attn: Investor Relations

Table of Contents

PROSPECTUS

\$100,000,000

MEDICINOVA, INC.

Common Stock

Preferred Stock

Warrants to Purchase Common Stock, Preferred Stock or Debt Securities

Debt Securities

We may from time to time offer to sell any combination of common stock; preferred stock; warrants to purchase common stock, preferred stock or debt securities; and debt securities, each as described in this prospectus, in one or more offerings. The aggregate initial offering price of all securities sold under this prospectus will not exceed \$100,000,000.

Of the \$100,000,000 of our securities that we may issue, we may issue up to \$18,807,665 of shares of our common stock to Aspire Capital Fund, LLC, or Aspire Capital, pursuant to a Common Stock Purchase Agreement between us and Aspire Capital dated August 20, 2012, which we refer to as the Aspire Capital Agreement. The purchase price for shares of stock is based upon one of two formulas, depending on the type of purchase notice we present to Aspire Capital. The purchase price for our stock sold pursuant to a regular purchase notice is the lower of (i) the lowest sale price on the date of sale and (ii) the arithmetic average of the three lowest closing sale prices for our common stock during the 12 consecutive business days ending on the business day immediately preceding the date of sale. The purchase price for our stock sold pursuant to a volume-weighted average price purchase notice is the lower of (i) the closing sale price on the date of sale and (ii) 95% of the volume-weighted average price for our common stock traded on the NASDAQ Global Market for the purchase date (or (a) if trading volume exceeds a certain limit as specified in the Aspire Capital Agreement or (b) if the sale price of the common stock falls below a certain threshold as specified in the Aspire Capital Agreement, the purchase price is 95% of the volume-weighted average price for the trading volume up to such time).

This prospectus provides a general description of the securities we may offer. Each time we sell securities, we will provide specific terms of the securities offered in a supplement to this prospectus. The prospectus supplement may also add, update or change information contained in this prospectus. You should read this prospectus and the applicable prospectus supplement carefully before you invest in any securities. This prospectus may not be used to consummate a sale of securities unless accompanied by the applicable prospectus supplement.

We will sell these securities to or through underwriters or dealers, directly to a limited number of purchasers or a single purchaser, through agents or through a combination of any of these methods of sale, as designated from time to time. If any agents or underwriters are involved in the sale of any of these securities, the applicable prospectus supplement will provide the names of the agents or underwriters and any applicable fees, commissions or discounts.

Our common stock is listed on the NASDAQ Global Market, or Nasdaq, under the symbol `MNOV` and on the Jasdaq Market (formerly the Hercules Market until its closure in 2010) of the Osaka Securities Exchange, or the OSE, under the code `4875`. On November 15, 2012, the closing price of our common stock on Nasdaq was \$1.88.

The number of outstanding shares of our common stock, par value \$0.001 per share, as of November 15, 2012 was 17,253,125.

Investing in our securities involves risks. See Risk Factors on page 5 of this prospectus and in the applicable prospectus supplement.

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 December 3, 2012.

Table of Contents

Table of Contents

| | Page |
|--|-------------|
| <u>ABOUT THIS PROSPECTUS</u> | ii |
| <u>SUMMARY</u> | 1 |
| <u>RISK FACTORS</u> | 5 |
| <u>FORWARD-LOOKING STATEMENTS</u> | 7 |
| <u>RATIOS OF EARNINGS TO FIXED CHARGES</u> | 9 |
| <u>USE OF PROCEEDS</u> | 9 |
| <u>SELECTED FINANCIAL DATA</u> | 9 |
| <u>DESCRIPTION OF COMMON STOCK</u> | 10 |
| <u>DESCRIPTION OF PREFERRED STOCK</u> | 12 |
| <u>DESCRIPTION OF WARRANTS</u> | 14 |
| <u>DESCRIPTION OF DEBT SECURITIES</u> | 16 |
| <u>LEGAL OWNERSHIP OF SECURITIES</u> | 23 |
| <u>PLAN OF DISTRIBUTION</u> | 26 |
| <u>LEGAL MATTERS</u> | 28 |
| <u>EXPERTS</u> | 28 |
| <u>INCORPORATION BY REFERENCE</u> | 28 |
| <u>WHERE YOU CAN FIND MORE INFORMATION</u> | 29 |

i.

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, utilizing a shelf registration process. Under this shelf registration process, we may offer to sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$100,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we sell securities under this shelf registration, we will provide a prospectus supplement that will contain specific information about the terms of that offering. The prospectus supplement may also add, update or change information contained in this prospectus. To the extent that any statement that we make in a prospectus supplement is inconsistent with statements made in this prospectus, the statements made in this prospectus will be deemed modified or superseded by those made in the prospectus supplement, as appropriate. You should read both this prospectus and any prospectus supplement, including all documents incorporated herein or therein by reference, together with additional information described under [Where You Can Find More Information](#).

You should rely only on the information that we have provided or incorporated by reference in this prospectus, any prospectus supplement, any free writing prospectus or other written communication we may authorize to be delivered to you. We have not, and have not authorized anyone else, to provide you with different or additional information. This prospectus, any prospectus supplement, any free writing prospectus and any other written communication do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they specifically relate, nor does this prospectus, any prospectus supplement, any free writing prospectus or any other written communication constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate as of any date other than the date on the front cover of this prospectus, the prospectus supplement or any related free writing prospectus, as applicable, or that the information contained in any document incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. You should not consider any information in this prospectus or in the documents incorporated by reference herein, any prospectus supplement, any free writing prospectus or other written communication to be investment, legal or tax advice. We encourage you to consult your own counsel, accountant and other advisors for legal, tax, business, financial and related advice regarding an investment in our securities.

As used in this prospectus, [MediciNova](#), [we](#), [our](#) and [us](#) refer to [MediciNova, Inc.](#) and its subsidiaries, unless stated otherwise or the context requires otherwise.

ii.

Table of Contents

SUMMARY

About MediciNova, Inc.

We are a development stage biopharmaceutical company focused on acquiring and developing novel, small molecule therapeutics for the treatment of serious diseases with unmet medical needs with a specific focus on the U.S. market. Through strategic alliances, primarily with Japanese pharmaceutical companies, we hold rights to a diversified portfolio of clinical and preclinical product candidates which we believe provide significant commercial opportunity for the Company. In December 2009 we acquired Avigen Inc., or Avigen, a biopharmaceutical company that focused on identifying and developing differentiated products to treat patients with serious disorders, whose potential product candidate is a macrophage migration inhibitory and a glial attenuator for central nervous system, or CNS, disorders such as neuropathic pain, opioid addiction and withdrawal and methamphetamine addiction.

Since our inception, we have acquired licenses to eight compounds for the development of ten product candidates which include clinical development for the treatment of acute exacerbations of asthma, multiple sclerosis (MS) and other central nervous system (CNS) disorders, bronchial asthma, interstitial cystitis (IC), solid tumor cancers, generalized anxiety disorders/insomnia, preterm labor and urinary incontinence. Two of such compounds have been in preclinical development for the treatment of thrombotic disorders.

At present, we are focusing our resources on the following prioritized product development programs:

MN-221 for the treatment of acute exacerbations of asthma and COPD exacerbations, for which we initiated a Phase 2 clinical trial (MN-221-CL-007) in the first quarter of 2009 to evaluate the safety and efficacy of MN-221 in patients with acute exacerbations of asthma treated in the emergency room. On March 21, 2012, we announced completion of the 176 patient enrollment of the Phase 2 MN-221-CL-007 clinical trial and on May 23, 2012, we announced that preliminary trial results did not statistically meet the primary endpoint, improvement in FEV1 (Forced Expiratory Volume in One Second) compared to placebo. On October 22, 2012 we met with the FDA to review future development of this product candidate. Although discussions have not been finalized, during the meeting the FDA identified the risk/benefit profile of MN-221 as a focal point for any further development of MN-221 and advised that a reduction in hospitalizations would need to be a pivotal trial primary endpoint. We are considering the design, costs and timing of potential future clinical trials of MN-221 and will determine its development strategy following the completion of our review. In 2010 we completed MN-221 COPD development, which included a Phase 1b clinical trial in patients with stable, moderate to severe COPD. In the first quarter of 2012 we initiated an additional Phase 1b/2a COPD clinical trial (MN-221 CL-012), and on August 23, 2012 we announced positive preliminary trial results.

MN-166, an ibudilast-based product development, for which we continue to pursue discussions with potential partners and other strategic collaborations. An MN-166 Phase 2 clinical trial in MS was completed in Eastern Europe in 2008 wherein positive safety and neuroprotective efficacy indicators were obtained, thus, directing next stage development towards a Phase 2b progressive MS indication. Limited animal safety and product manufacturing and stability development has been completed. In the area of drug addiction, a Phase 1b/2a opioid withdrawal clinical trial funded by the National Institute on Drug Abuse, or NIDA, was completed at the end of 2010. A Phase 1b NIDA-funded clinical trial in methamphetamine-dependent volunteers with expert investigators at UCLA initiated in the fourth quarter of 2010 and is currently enrolling patients. A headache and pain specialist in Australia initiated an investigator sponsored Phase 2 clinical trial of MN-166 as a potential new pharmacotherapy for medication overuse headache that is expected to complete enrollment at the end of 2012. In September 2012 we announced approval and funding by NIDA of a Phase 2 clinical trial.

Table of Contents

studying the use of MN-166 for the treatment of methamphetamine addiction. In partnership with UCLA, this clinical trial will build on the ongoing UCLA MN-166 Phase 1b safety trial. We intend to enter into additional strategic alliances to support further clinical development of MN-166.

Upon completion of proof-of-concept Phase 2 clinical trials, we intend to enter into strategic alliances with leading pharmaceutical or biotech companies to support further clinical development, and plan to maintain certain commercialization rights in selected markets. Depending on decisions we may make as to further development of MN-221, we may seek to raise additional capital and/or enter into a collaboration. We may also pursue potential partners and potential acquirers of license rights to our programs in markets outside the U.S. In addition, we continue to limit activities for the balance of our existing product development programs in order to focus on our prioritized product development programs. For our remaining product development programs, we plan to conduct development activities only to the extent deemed necessary to maintain our license rights or maximize value while pursuing a variety of initiatives to monetize such programs.

We were incorporated under the laws of the State of Delaware in September 2000. Our principal executive offices are located at 4350 La Jolla Village Drive, Suite 950, San Diego, CA 92122, and our telephone number is (858) 373-1500. Information about the company is also available at our website at www.medicinova.com, which includes links to reports we have filed with the SEC. We do not incorporate the information on our website into this prospectus, and you should not consider it part of this prospectus or part of any prospectus supplement.

The Securities We May Offer

We may offer shares of our common stock and preferred stock, debt securities and/or warrants, either individually or in combination, with a total value of up to \$100,000,000 from time to time at prices and on terms to be determined by market conditions at the time of the offering, of which up to \$18,807,665 may be sold to Aspire Capital in shares of our common stock under the Aspire Capital Agreement, as described below. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities, including, to the extent applicable:

designation or classification;

aggregate principal amount or aggregate offering price;

maturity; if applicable

original issue discount, if any;

rates and times of payment of interest, dividends or other payments, if any;

redemption, conversion, exercise, exchange, settlement or sinking fund terms, if any;

conversion, exchange or settlement prices or rates, if any, and, if applicable, any provisions for changes to or adjustments in the conversion, exchange or settlement prices or rates and in the securities or other property receivable upon conversion, exchange or settlement;

ranking;

restrictive covenants, if any;

voting or other rights, if any; and

certain federal income tax considerations.

2.

Table of Contents

A prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus or in documents we have incorporated by reference into this prospectus. However, no prospectus supplement or free writing prospectus shall offer a security that is not registered and described in this prospectus at the time of the effectiveness of the registration statement of which this prospectus is a part.

This prospectus may not be used to offer or sell any securities unless accompanied by a prospectus supplement.

We may sell the securities directly or through underwriters, dealers or agents. Aspire Capital may be an underwriter within the meaning of the Securities Act of 1933, as amended (the Securities Act) and any profits on the sales of shares of our common stock by Aspire Capital and any discounts, commissions or concessions received by Aspire Capital may be deemed to be underwriting discounts and commissions under the Securities Act. We, and our underwriters, dealers or agents, reserve the right to accept or reject all or part of any proposed purchase of securities. If we do offer securities through underwriters or agents, we will include in the applicable prospectus supplement:

the names of those underwriters or agents;

applicable fees, discounts and commissions to be paid to them;

details regarding over-allotment options, if any; and

the net proceeds to us.

Common Stock. We may issue shares of our common stock from time to time. Holders of our common stock are entitled to one vote per share for the election of directors and on all other matters that require stockholder approval. Subject to any preferential rights of any then outstanding preferred stock, in the event of our liquidation, dissolution or winding up, holders of our common stock are entitled to share ratably in the assets remaining after payment of liabilities and the liquidation preferences of any then outstanding preferred stock. Our common stock does not carry any preemptive rights enabling a holder to subscribe for, or receive shares of, any class of our common stock or any other securities convertible into shares of any class of our common stock, or any redemption rights.

Preferred Stock. Our board of directors will determine the designations, voting powers, preferences and rights of the preferred stock, as well as the qualifications, limitations or restrictions thereof, including dividend rights, conversion rights, preemptive rights, terms of redemption or repurchase, liquidation preferences, sinking fund terms and the number of shares constituting any series or the designation of any series. Convertible preferred stock will be convertible into our common stock or exchangeable for other securities. Conversion may be mandatory or at your option and would be at prescribed conversion rates.

We will fix the rights, preferences, privileges, qualifications and restrictions of the preferred stock of each series that we sell under this prospectus and applicable prospectus supplements in a certificate of designation relating to that series. We will incorporate by reference into the registration statement of which this prospectus is a part the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of the related series of preferred stock. We urge you to read the prospectus supplement (and any related free writing prospectus) related to the series of preferred stock being offered, as well as the complete certificate of designation that contains the terms of the applicable series of preferred stock.

Debt Securities. We may issue debt securities from time to time, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. The senior debt securities will rank equally with any other unsubordinated debt that we may have and may be secured or unsecured. The subordinated debt

Table of Contents

securities will be subordinate and junior in right of payment, to the extent and in the manner described in the instrument governing the debt, to all or some portion of our indebtedness. Any convertible debt securities that we issue will be convertible into or exchangeable for our common stock, preferred stock or other securities of ours. Conversion may be mandatory or at your option and would be at prescribed conversion rates.

The debt securities will be issued under one or more documents called indentures, which are contracts between us and a trustee for the holders of the debt securities. In this prospectus, we have summarized certain general features of the debt securities. We urge you, however, to read the prospectus supplement (and any related free writing prospectus) related to the series of debt securities being offered, as well as the complete indentures that contain the terms of the debt securities. Indentures have been filed as exhibits to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports we file with the SEC.

Warrants. We may issue warrants for the purchase of common stock, preferred stock and/or debt securities in one or more series, from time to time. We may issue warrants independently or together with common stock, preferred stock and/or debt securities, and the warrants may be attached to or separate from those securities.

The warrants will be evidenced by warrant certificates issued under one or more warrant agreements, which are contracts between us and an agent for the holders of the warrants. In this prospectus, we have summarized certain general features of the warrants. We urge you, however, to read the prospectus supplement (and any related free writing prospectus) related to the series of warrants being offered, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants. Complete warrant agreements and warrant certificates containing the terms of the warrants being offered will be filed as exhibits to the registration statement of which the prospectus is a part or will be incorporated by reference from reports we file with the SEC.

Offering of Shares of Common Stock Pursuant to the Aspire Capital Agreement. On August 20, 2012, we entered into the Aspire Capital Agreement, pursuant to which we may issue and sell shares of our common stock having an aggregate offering price of up to \$20.6 million from time to time to Aspire Capital. In accordance with the terms of the Aspire Capital Agreement, we sold initial shares to Aspire Capital at a purchase price of \$1,000,000 immediately upon the execution of the Aspire Capital Agreement, issued 363,636 shares to Aspire Capital in consideration for entering into the Aspire Capital Agreement, and may sell up to an additional \$19,000,000 of shares of common stock to Aspire Capital over the two year term of the agreement.

The purchase price for shares of stock is based upon one of two formulas, depending on the type of purchase notice we present to Aspire Capital. The purchase price for our stock sold pursuant to a regular purchase notice is the lower of (i) the lowest sale price on the date of sale and (ii) the arithmetic average of the three lowest closing sale prices for our common stock during the 12 consecutive business days ending on the business day immediately preceding the date of sale. The purchase price for our stock sold pursuant to a volume-weighted average price purchase notice is the lower of (i) the closing sale price on the date of sale and (ii) 95% of the volume-weighted average price for our common stock traded on Nasdaq for the purchase date (or (a) if trading volume exceeds a certain limit as specified in the Aspire Capital Agreement or (b) if the sale price of the common stock falls below a certain threshold as specified in the Aspire Capital Agreement, the purchase price is 95% of the volume-weighted average price for the trading volume up to such time).

As of November 15, 2012, we have completed sales totaling 706,060 shares of common stock at prices ranging from \$1.65 to \$1.9267 per share and generating gross proceeds of approximately \$1.2 million.

Table of Contents

RISK FACTORS

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described below and those under the heading "Risk Factors" contained in our most recent annual report on Form 10-K, which has been filed with the SEC and is incorporated by reference in this prospectus, as well as any updates thereto contained in subsequent filings with the SEC or any applicable prospectus supplement or free writing prospectus, before deciding whether to purchase any of the securities being registered pursuant to the registration statement of which this prospectus is a part. Each of the risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities, and the occurrence of any of these risks might cause you to lose all or a part of your investment. Moreover, the risks described are not the only risks that we face. Additional risks not presently known to us or that we currently believe are immaterial may also significantly impair our business operations.

Risks Related to Our Business and Industry

MN-221, MN-166 or any other product candidate we advance into clinical trials may cause undesirable side effects or have other properties that may delay or prevent their regulatory approval or commercialization or limit the commercial potential.

Undesirable side effects caused by MN-221, MN-166 or any other product candidate we advance into clinical trials could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval by the FDA or other regulatory authorities for any or all targeted indications. This, in turn, could prevent us from commercializing the affected product candidate and generating revenues from its sale. The most serious side effects observed in patients who received MN-221 in Phase 2 clinical trials were transient cardiovascular abnormalities and/or hypokalemia.

In addition, if MN-221, MN-166 or any other product candidate we may develop receives marketing approval and we or others later identify undesirable side effects caused by the product, a number of significant negative consequences could result, including:

regulatory authorities may withdraw their approval of the product or place restrictions on the way it is prescribed;

regulatory authorities may require a larger clinical benefit for approval to offset the risk;

regulatory authorities may require the addition of labeling statements that could diminish the usage of the product or otherwise limit the commercial success of the product;

we may be required to change the way the product is administered, conduct additional clinical trials or change the labeling of the product or implement a risk evaluation and mitigation strategy;

we may choose to discontinue sale of the product;

we could be sued and held liable for harm caused to patients;

we may not be able to enter into collaboration agreements on acceptable terms and execute on our business model; and

our reputation may suffer.

Because the results of early clinical trials are not necessarily predictive of future results, MN-221, MN-166 or any other product candidate we advance into clinical trials in any indication may not have favorable results in later clinical trials, if any, or receive regulatory approval.

Edgar Filing: MEDICINOVA INC - Form 424B5

Our product candidates are subject to the risks of failure inherent in drug development. We will be required to demonstrate through well-controlled clinical trials that our product candidates are safe and effective for use in

5.

Table of Contents

a diverse population for its target indications before we can seek regulatory approvals for its commercial sale. Success in early clinical trials does not mean that later clinical trials will be successful because product candidates in later-stage clinical trials may fail to demonstrate sufficient safety or efficacy despite having progressed through initial clinical testing, even at statistically significant levels.

Companies frequently suffer significant setbacks in advanced clinical trials, even after earlier clinical trials have shown promising results. Any of our planned clinical trials for MN-221, MN-166 or our other product candidates may not be successful for a variety of reasons, including the clinical trial designs, the failure to enroll a sufficient number of patients, undesirable side effects and other safety concerns and the inability to demonstrate sufficient efficacy. If a product candidate fails to demonstrate sufficient safety or efficacy, we would experience potentially significant delays in, or be required to abandon, development of such product candidate.

6.

Table of Contents

FORWARD-LOOKING STATEMENTS

Any statements in this prospectus or any applicable prospectus supplement, including the documents that we incorporate by reference herein or therein, about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and are forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act. These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to, statements about:

the potential for our product candidates to receive regulatory approval for one or more indications on a timely basis, or at all;

the success, timing, design and results of clinical trials for our product candidates, including any delays in commencing or completing enrollment for our ongoing or planned clinical trials;

plans for future clinical trials, regulatory submissions and the outcome of meetings with regulators;

unexpected adverse side effects or inadequate therapeutic efficacy of our product candidates that could delay or prevent regulatory approval or commercialization or that could result in product liability claims;

other difficulties or delays in development, testing, manufacturing and marketing of and obtaining regulatory approval for our product candidates;

the continuation and success of our collaborations with our licensors;

the performance of third party service providers and manufacturers;

intellectual property rights and disputes, including the scope and validity of patent protection for our product candidates;

the size and growth of the potential markets for our product candidates and our ability to serve those markets;

the potential to attract one or more strategic partners and terms of any related transactions;

our ability to utilize our equity line of credit facility with Aspire Capital;

intense competition and our ability to compete if any of our product candidates are ever commercialized;

regulatory developments in the United States and foreign countries;

the potential impact of uncertainties in the credit and capital markets or a future deterioration of these markets on our investment portfolio; and

our ability to raise sufficient capital when needed, or at all.

In some cases, you can identify forward-looking statements by terms such as *may*, *will*, *should*, *could*, *would*, *expects*, *plans*, *anticipates*, *believes*, *estimates*, *projects*, *predicts*, *potential* and similar expressions intended to identify forward-looking statements. These statements represent our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading

Risk Factors contained in this prospectus supplement and in our SEC filings. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

7.

Table of Contents

You should read this prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

You should rely only on the information contained, or incorporated by reference, in this prospectus supplement, the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering. We have not authorized anyone to provide you with different information. The securities offered under this prospectus are not being offered in any state where the offer is not permitted. You should not assume that the information contained in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date on the front of this prospectus supplement or the accompanying prospectus, as applicable, or that any information incorporated by reference in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date of the document so incorporated by reference. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

8.

Table of Contents**RATIOS OF EARNINGS TO FIXED CHARGES**

If we offer debt securities and/or preference equity securities under this prospectus, then we will, if required at that time, provide a ratio of earnings to fixed charges and/or ratio of combined fixed charges and preference dividends to earnings, respectively, in the applicable prospectus supplement for such offering.

USE OF PROCEEDS

Unless otherwise provided in the applicable prospectus supplement, we intend to use the net proceeds from the sale of the securities under this prospectus for general corporate purposes, including the further development, manufacture and commercialization of our prioritized product candidates and for other working capital expenditures. We may also use a portion of the net proceeds to acquire or invest in businesses, products and technologies that are complementary to our own. Pending the application of the net proceeds as described above, we intend to invest the net proceeds in short-term, investment-grade, interest-bearing securities.

SELECTED FINANCIAL DATA

On January 1, 2012, we adopted new guidance regarding comprehensive income, which was applied retrospectively, that provides companies with the option to present the components of net income, the components of other comprehensive income and the total of comprehensive income either in a single continuous statement of comprehensive income or in two separate but consecutive statements. The objective of the standard is to increase the prominence of items reported in other comprehensive income and to facilitate convergence of accounting principles generally accepted in the United States and International Financial Reporting Standards. The standard eliminates the option to present components of other comprehensive income as part of the statement of changes in stockholders' equity. The amendments in this guidance do not change the items that must be reported in other comprehensive income or when an item of other comprehensive income must be reclassified in net income. We adopted the one comprehensive approach in the first quarter of 2012.

The table below presents selected historical consolidated statements of comprehensive loss data. We have derived our statements of comprehensive income (loss) data for the years ended December 31, 2009, 2010 and 2011 from our audited financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2011 and incorporated by reference in this prospectus. The following selected financial information revises historical information to illustrate the presentation required by the new guidance regarding comprehensive income for each of the periods presented.

| | Year Ended December 31, | | | September 26, |
|---|-------------------------|-------------|-------------|---|
| | 2009 | 2010 | 2011 | 2000 (inception) to December 31, 2011 |
| | (in thousands) | | | |
| Net Loss | \$ (20,369) | \$ (20,187) | \$ (17,734) | \$ (285,272) |
| Other comprehensive loss: | | | | |
| Currency translation adjustment | (35) | 9 | (1) | (57) |
| Comprehensive loss attributable to MediciNova | \$ (20,404) | \$ (20,178) | \$ (17,735) | \$ (285,329) |

Table of Contents

DESCRIPTION OF COMMON STOCK

We have authority to issue 100,000,000 shares of common stock, par value \$0.001 per share. As of November 15, 2012, we had 17,253,125 shares of our common stock outstanding. The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

Subject to preferences that may be applicable to any shares of preferred stock outstanding from time to time, if any, the holders of our common stock are entitled to the following:

Dividends. The holders of outstanding shares of common stock are entitled to receive dividends out of assets legally available for the payment of dividends at the times and in the amounts as our board of directors from time to time may determine, subject to any preferential dividend rights of any holder of outstanding shares of our preferred stock.

Voting. Each holder of common stock is entitled to one vote for each share of common stock held on all matters submitted to a vote of our stockholders, including the election of directors. We have not provided for cumulative voting for the election of directors in our restated certificate of incorporation. This means that the holders of a majority of the shares voted can elect all of the directors then standing for election.

Preemptive rights, conversion and redemption. Our common stock is not subject to preemptive rights and will not be subject to conversion or redemption.

Liquidation, dissolution and winding-up. Upon liquidation, dissolution or winding-up, the holders of our common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preferences of any preferred stock.

Each outstanding share of common stock is duly and validly issued, fully paid and non-assessable.

Delaware Anti-Takeover Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, these provisions prohibit a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years following the date that the stockholder became an interested stockholder, unless:

prior to such time, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

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

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

Section 203 defines "business combination" to include the following:

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

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

10.

Table of Contents

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

any transaction involving the corporation that has the effect of increasing the proportionate share of its stock owned by the interested stockholder; or

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

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

The statute could prohibit or delay mergers or other takeover or change in control attempts and, accordingly, may discourage attempts to acquire us.

Removal of Directors and Vacancies

Our restated certificate of incorporation and amended and restated bylaws provide that directors may be removed only for cause and only by the affirmative vote of the holders of a majority of shares of capital stock present in person or by proxy and entitled to vote. Under our restated certificate of incorporation and amended and restated bylaws, any vacancy on the board of directors, including a vacancy resulting from an enlargement of the board of directors, may be filled only by vote of a majority of the directors then in office. The limitations on the ability of our stockholders to remove directors and fill vacancies could make it more difficult for a third-party to acquire, or discourage a third-party from seeking to acquire, control of us.

Stockholder Meetings

Our restated certificate of incorporation and amended and restated bylaws provide that any action required or permitted to be taken by stockholders at an annual meeting or special meeting of stockholders may only be taken if it is properly brought before such meeting and may not be taken by written action in lieu of a meeting. Our restated certificate of incorporation and amended and restated bylaws also provide that, except as otherwise required by law, special meetings of the stockholders can only be called by the chairman of the board, the chief executive officer or the board of directors. In addition, our amended and restated bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of stockholders, including proposed nominations of candidates for election to the board of directors. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors, or by a stockholder of record on the record date for the meeting who is entitled to vote at the meeting and who has delivered timely written notice in proper form to the secretary of the stockholder's intention to bring such business before the meeting. These provisions could have the effect of delaying until the next stockholder meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities.

Undesignated Preferred Stock

The authorization in our restated certificate of incorporation of 3,000,000 shares, par value \$0.01 per share, of preferred stock, of which 2,780,000 shares are undesignated, makes it possible for the board of directors, without obtaining further stockholder approval, to issue preferred stock with voting rights or other rights or preferences that could impede the success of any attempt to take control of us.

Table of Contents

DESCRIPTION OF PREFERRED STOCK

We have authority to issue 3,000,000 shares of preferred stock, par value \$0.01 per share. As of November 15, 2012, we had 220,000 shares of Series B Convertible Preferred Stock outstanding.

General

Under our restated certificate of incorporation, our board of directors is authorized generally without stockholder approval to issue shares of preferred stock from time to time, in one or more classes or series. Prior to issuance of shares of each class or series, our board of directors is required by Delaware law to adopt resolutions and file a certificate of designation with the Secretary of State of the State of Delaware. The certificate of designation fixes for each class or series the terms, preferences, conversion or other rights, voting powers, restrictions, limitations as to dividends or other distributions, qualifications and terms or conditions of redemption for each class or series. Any shares of preferred stock will, when issued, be fully paid and nonassessable.

For any series of preferred stock that we may issue, our board of directors will determine and the prospectus supplement relating to such series will describe:

the title and stated value of the preferred stock;

the number of shares of the preferred stock offered, the liquidation preference per share and the offering price of the preferred stock;

the dividend rate(s), period(s) or payment date(s) or method(s) of calculation applicable to the preferred stock;

whether dividends are cumulative or non-cumulative and, if cumulative, the date from which dividends on the preferred stock will accumulate;

our right, if any, to defer payment of dividends and the maximum length of any such deferral period;

the procedures for auction and remarketing, if any, for the preferred stock;

the provisions for a sinking fund, if any, for the preferred stock;

the provision for redemption, if applicable, of the preferred stock;

any listing of the preferred stock on any securities exchange;

the terms and conditions, if applicable, upon which the preferred stock will be convertible into common stock, including the conversion price or manner of calculation and conversion period;

voting rights, if any, of the preferred stock;

whether interests in the preferred stock will be represented by depositary shares;

a discussion of any material or special United States federal income tax considerations applicable to the preferred stock;

the relative ranking and preferences of the preferred stock as to dividend rights and rights upon the liquidation, dissolution or winding up of our affairs;

any limitations on issuance of any class or series of preferred stock ranking senior to or on a parity with the class or series of preferred stock as to dividend rights and rights upon the liquidation, dissolution or winding up of our affairs; and

any other specific terms, preferences, rights, limitations or restrictions of the preferred stock.

12.

Table of Contents

Delaware law provides that the holders of preferred stock will have the right to vote separately as a class (or, in some cases, as a series) on an amendment to our restated certificate of incorporation if the amendment would change the par value or, unless the restated certificate of incorporation then in effect provided otherwise, the number of authorized shares of such class or change the powers, preferences or special rights of such class or series so as to adversely affect the class or series, as the case may be. This right is in addition to any voting rights that may be provided for in the applicable certificate of designation.

Series B Convertible Preferred Stock

On September 26, 2011, we entered into a Stock Purchase Agreement with Kissei Pharmaceutical Co. Ltd., or Kissei, pursuant to which we sold to Kissei 220,000 shares of our Series B Convertible Preferred Stock, par value \$0.01 per share (the "Series B Preferred"), at a price of \$25.00 per share.

On September 26, 2011, we filed a Certificate of Designation, Preferences and Rights of the Series B Convertible Preferred Stock (the "Certificate of Designation") with the Secretary of State of the State of Delaware, authorizing 220,000 shares of Series B Preferred and establishing the rights, preferences, privileges and obligations thereof. Dividends are payable to the Series B Preferred in a per share amount equal (on an as-if-converted-to-common-stock-basis) to the amount paid or set aside for each share of our common stock. The Series B Preferred ranks pari passu (on an as-if-converted-to-common-stock basis) with our common stock in rights of payment upon a liquidation, Acquisition (as defined in the Certificate of Designation) or Asset Transfer (as defined in the Certificate of Designation). The Series B Preferred is convertible at any time into our common stock, initially at a rate of 10 shares of common stock for each share of Series B Preferred. The conversion rate will be adjusted for certain events, such as stock splits, stock dividends, reclassifications and recapitalizations. The Series B Preferred does not have voting rights unless required by the Delaware General Corporation Law. The consent of the holders of a majority of the outstanding shares of the Series B Preferred is required for any action by the Company which (a) creates any new class or series of shares of the Company that are senior to, or pari passu with, the Series B Preferred or (b) amends our Certificate of Incorporation so as to materially adversely affect to the holders of Series B Preferred in a manner that is different from the effect of such action on the other classes and series of our outstanding capital stock. The Series B Preferred does not have redemption rights.

Ranking

Unless we specify otherwise in the applicable prospectus supplement, the preferred stock will rank, with respect to dividends and upon our liquidation, dissolution or winding up:

senior to all classes or series of our common stock and to all of our equity securities ranking junior to the preferred stock;

on a parity with all of our equity securities the terms of which specifically provide that the equity securities rank on a parity with the preferred stock; and

junior to all of our equity securities the terms of which specifically provide that the equity securities rank senior to the preferred stock.

The term "equity securities" does not include convertible debt securities.

Transfer Agent and Registrar

The transfer agent and registrar for any series or class of preferred stock will be set forth in the applicable prospectus supplement.

Table of Contents

DESCRIPTION OF WARRANTS

The following is a general description of the terms of the warrants we may issue from time to time unless we provide otherwise in the prospectus supplement. Particular terms of any warrants we offer will be described in the prospectus supplement relating to such warrants.

General Terms

We may issue warrants to purchase common stock, preferred stock or debt securities. Warrants may be issued independently or together with other securities and may be attached or separate from such securities. We will issue each series of warrants under a separate warrant agreement to be entered into between us and a warrant agent. The warrant agent will act solely as our agent and will not assume any obligation or relationship of agency for or with holders or beneficial owners of warrants.

A prospectus supplement will describe the particular terms of any series of warrants we may issue, including the following:

the title and aggregate number of the warrants;

the price or prices at which the warrants will be issued and the currency or currencies in which the price of the warrants may be payable;

if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;

in the case of warrants to purchase debt securities, the principal amount of debt securities purchasable upon exercise of one warrant;

in the case of warrants to purchase common stock or preferred stock, the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;

the date on which the right to exercise the warrants will commence and the date on which such right will expire (subject to any extension);

whether the warrants will be issued in registered form or bearer form;

if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;

if applicable, the date on and after which the warrants and the related securities will be separately transferable;

if applicable, the procedures for adjusting the exercise price and number of shares of common stock or preferred stock purchasable upon the exercise of each warrant upon the occurrence of certain events, including stock splits, reverse stock splits, combinations, subdivisions or reclassifications of common stock or preferred stock;

Edgar Filing: MEDICINOVA INC - Form 424B5

the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;

the terms of any rights to redeem or call the warrants;

information with respect to book-entry procedures, if any;

the terms of the securities issuable upon exercise of the warrants;

if applicable, a discussion of any material or special U.S. federal income tax consequences of holding or exercising the warrants; and

any other terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

14.

Table of Contents

We and the warrant agent may amend or supplement the warrant agreement for a series of warrants without the consent of the holders of the warrants issued thereunder to effect changes that are not inconsistent with the provisions of the warrants and that do not materially and adversely affect the interests of the holders of the warrants.

Exercise of Warrants

Each warrant will entitle the holder to purchase for cash such common stock or preferred stock at the exercise price or such principal amount of debt securities as shall in each case be set forth in, or be determinable as set forth in, the prospectus supplement relating to the warrants offered thereby. Warrants may be exercised as set forth in the prospectus supplement beginning on the date specified therein and continuing until the close of business on the expiration date set forth in the prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants. If we so indicate in the applicable prospectus supplement, holders of the warrants may surrender securities as all or part of the exercise price for warrants.

Prior to exercising their warrants, holders of warrants will not have any of the rights of holders of the securities purchasable upon such exercise, including, in the case of warrants to purchase common stock or preferred stock, the right to receive dividends, if any, or payments upon our liquidation, dissolution or winding up or to exercise any voting rights or, in the case of warrants to purchase debt securities, the right to receive principal, premium, if any, or interest payments, on the debt securities purchasable upon exercise or to enforce covenants in the applicable indenture.

Governing Law

Any warrants and related warrant agreements will be governed by, and construed in accordance with, the laws of the State of New York.

Table of Contents

DESCRIPTION OF DEBT SECURITIES

The following is a general description of the terms of debt securities we may issue from time to time unless we provide otherwise in the prospectus supplement. Particular terms of any debt securities we offer will be described in the prospectus supplement relating to such debt securities. Unless the context requires otherwise, whenever we refer to the indentures, we also are referring to any supplemental indentures that specify the terms of a particular series of debt securities.

We will issue the senior debt securities under the senior indenture that we will enter into with the trustee named in the senior indenture. We will issue the subordinated debt securities under the subordinated indenture that we will enter into with the trustee named in the subordinated indenture. The indentures will be qualified under the Trust Indenture Act of 1939. We use the term *debenture trustee* to refer to either the trustee under the senior indenture or the trustee under the subordinated indenture, as applicable. We have filed forms of indentures to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of the debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports that we file with the SEC.

The following summaries of material provisions of the senior debt securities, the subordinated debt securities and the indentures are subject to, and qualified in their entirety by reference to, all of the provisions of the indenture applicable to a particular series of debt securities. We urge you to read the applicable prospectus supplements and any related free writing prospectuses related to the debt securities that we may offer under this prospectus, as well as the complete indentures that contain the terms of the debt securities. Except as we may otherwise indicate, the terms of the senior indenture and the subordinated indenture are identical.

General

We will describe in the applicable prospectus supplement the terms of the series of debt securities being offered, including:

the title;

the principal amount being offered, and if a series, the total amount authorized and the total amount outstanding;

any limit on the amount that may be issued;

whether or not we will issue the series of debt securities in global form, the terms and who the depository will be;

the maturity date;

whether and under what circumstances, if any, we will pay additional amounts on any debt securities held by a person who is not a United States person for tax purposes, and whether we can redeem the debt securities if we have to pay such additional amounts;

the annual interest rate, which may be fixed or variable, or the method for determining the rate and the date interest will begin to accrue, the dates interest will be payable and the regular record dates for interest payment dates or the method for determining such dates;

whether or not the debt securities will be secured or unsecured, and the terms of any secured debt;

the terms of the subordination of any series of subordinated debt;

the place where payments will be payable;

restrictions on transfer, sale or other assignment, if any;

16.

Table of Contents

our right, if any, to defer payment of interest and the maximum length of any such deferral period;

the date, if any, after which, and the price at which, we may, at our option, redeem the series of debt securities pursuant to any optional or provisional redemption provisions and the terms of those redemption provisions;

the date, if any, on which, and the price at which we are obligated, pursuant to any mandatory sinking fund or analogous fund provisions or otherwise, to redeem, or at the holder's option to purchase, the series of debt securities and the currency or currency unit in which the debt securities are payable;

whether the indenture will restrict our ability and/or the ability of our subsidiaries to:

incur additional indebtedness;

issue additional securities;

create liens;

pay dividends and make distributions in respect of our capital stock and the capital stock of our subsidiaries;

redeem capital stock;

place restrictions on our subsidiaries' ability to pay dividends, make distributions or transfer assets;

make investments or other restricted payments;

sell or otherwise dispose of assets;

enter into sale-leaseback transactions;

engage in transactions with stockholders and affiliates;

issue or sell stock of our subsidiaries; or

effect a consolidation or merger;

Edgar Filing: MEDICINOVA INC - Form 424B5

whether the indenture will require us to maintain any interest coverage, fixed charge, cash flow-based, asset-based or other financial ratios;

a discussion of any material United States federal income tax considerations applicable to the debt securities;

information describing any book-entry features;

provisions for a sinking fund purchase or other analogous fund, if any;

the applicability of the provisions in the indenture on discharge;

whether the debt securities are to be offered at a price such that they will be deemed to be offered at an original issue discount as defined in paragraph (a) of Section 1273 of the Internal Revenue Code;

the denominations in which we will issue the series of debt securities, if other than denominations of \$1,000 and any integral multiple thereof;

the currency of payment of debt securities if other than U.S. dollars and the manner of determining the equivalent amount in U.S. dollars; and

any other specific terms, preferences, rights or limitations of, or restrictions on, the debt securities, including any additional events of default or covenants provided with respect to the debt securities, and any terms that may be required by us or advisable under applicable laws or regulations.

Table of Contents

Conversion or Exchange Rights

We will set forth in the prospectus supplement the terms on which a series of debt securities may be convertible into or exchangeable for our common stock or our other securities, if applicable. We will include provisions as to whether conversion or exchange is mandatory, at the option of the holder or at our option. We may include provisions pursuant to which the number of shares of our common stock or our other securities that the holders of the series of debt securities receive would be subject to adjustment.

Consolidation, Merger or Sale

Unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, the indentures will not contain any covenant that restricts our ability to merge or consolidate, or sell, convey, transfer or otherwise dispose of all or substantially all of our assets. However, any successor to or acquirer of such assets must assume all of our obligations under the indentures or the debt securities, as appropriate. If the debt securities are convertible into or exchangeable for our other securities or securities of other entities, the person with whom we consolidate or merge or to whom we sell all of our property must make provisions for the conversion of the debt securities into securities that the holders of the debt securities would have received if they had converted the debt securities before the consolidation, merger or sale.

Events of Default Under the Indenture

Unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, the following are events of default under the indentures with respect to any series of debt securities that we may issue:

if we fail to pay interest when due and payable and our failure continues for 90 days and the time for payment has not been extended or deferred;

if we fail to pay the principal, premium or sinking fund payment, if any, when due and payable and the time for payment has not been extended or delayed;

if we fail to observe or perform any other covenant contained in the debt securities or the indentures, other than a covenant specifically relating to another series of debt securities, and our failure continues for 90 days after we receive notice from the debenture trustee or holders of at least 25% in aggregate principal amount of the outstanding debt securities of the applicable series; and

if specified events of bankruptcy, insolvency or reorganization occur.

If an event of default with respect to debt securities of any series occurs and is continuing, other than an event of default specified in the last bullet point above, the debenture trustee or the holders of at least 25% in aggregate principal amount of the outstanding debt securities of that series, by notice to us in writing, and to the debenture trustee if notice is given by such holders, may declare the unpaid principal of, premium, if any, and accrued interest, if any, due and payable immediately. If an event of default specified in the last bullet point above occurs with respect to us, the principal amount of and accrued interest, if any, of each issue of debt securities then outstanding shall be due and payable without any notice or other action on the part of the debenture trustee or any holder.

The holders of a majority in principal amount of the outstanding debt securities of an affected series may waive any default or event of default with respect to the series and its consequences, except defaults or events of default regarding payment of principal, premium, if any, or interest, unless we have cured the default or event of default in accordance with the indenture. Any waiver shall cure the default or event of default.

Subject to the terms of the indentures, if an event of default under an indenture shall occur and be continuing, the debenture trustee will be under no obligation to exercise any of its rights or powers under such indenture at the request or direction of any of the holders of the applicable series of debt securities, unless such

Table of Contents

holders have offered the debenture trustee reasonable indemnity. The holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the debenture trustee, or exercising any trust or power conferred on the debenture trustee, with respect to the debt securities of that series, provided that:

the direction so given by the holder is not in conflict with any law or the applicable indenture; and

subject to its duties under the Trust Indenture Act of 1939, the debenture trustee need not take any action that might involve it in personal liability or might be unduly prejudicial to the holders not involved in the proceeding.

A holder of the debt securities of any series will have the right to institute a proceeding under the indentures or to appoint a receiver or trustee, or to seek other remedies only if:

the holder has given written notice to the debenture trustee of a continuing event of default with respect to that series;

the holders of at least 25% in aggregate principal amount of the outstanding debt securities of that series have made written request, and such holders have offered reasonable indemnity to the debenture trustee to institute the proceeding as trustee; and

the debenture trustee does not institute the proceeding, and does not receive from the holders of a majority in aggregate principal amount of the outstanding debt securities of that series other conflicting directions within 90 days after the notice, request and offer.

These limitations do not apply to a suit instituted by a holder of debt securities if we default in the payment of the principal, premium, if any, or interest on, the debt securities.

We will periodically file statements with the debenture trustee regarding our compliance with specified covenants in the indentures.

Modification of Indenture; Waiver

We and the debenture trustee may change an indenture without the consent of any holders with respect to specific matters:

to fix any ambiguity, defect or inconsistency in the indenture;

to comply with the provisions described above under **Description of Debt Securities Consolidation, Merger or Sale**;

to comply with any requirements of the SEC in connection with the qualification of any indenture under the Trust Indenture Act of 1939;

to add to, delete from or revise the conditions, limitations, and restrictions on the authorized amount, terms, or purposes of issue, authentication and delivery of debt securities, as set forth in the indenture;

to provide for the issuance of and establish the form and terms and conditions of the debt securities of any series as provided under **Description of Debt Securities General** to establish the form of any certifications required to be furnished pursuant to the terms of the indenture or any series of debt securities, or to add to the rights of the holders of any series of debt securities;

to evidence and provide for the acceptance of appointment hereunder by a successor trustee;

to provide for uncertificated debt securities in addition to or in place of certificated debt securities and to make all appropriate changes for such purpose;

to add to our covenants such new covenants, restrictions, conditions or provisions for the protection of the holders, and to make the occurrence, or the occurrence and the continuance, of a default in any such additional covenants, restrictions, conditions or provisions an event of default; or

Table of Contents

to change anything that does not materially adversely affect the interests of any holder of debt securities of any series. In addition, under the indentures, the rights of holders of a series of debt securities may be changed by us and the debenture trustee with the written consent of the holders of at least a majority in aggregate principal amount of the outstanding debt securities of each series that is affected. However, unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, we and the debenture trustee may make the following changes only with the consent of each holder of any outstanding debt securities affected:

extending the fixed maturity of the series of debt securities;

reducing the principal amount, reducing the rate of or extending the time of payment of interest, or reducing any premium payable upon the redemption of any debt securities; or

reducing the percentage of debt securities, the holders of which are required to consent to any amendment, supplement, modification or waiver.

Discharge

Each indenture provides that we can elect to be discharged from our obligations with respect to one or more series of debt securities, except for specified obligations, including obligations to:

register the transfer or exchange of debt securities of the series;

replace stolen, lost or mutilated debt securities of the series;

maintain paying agencies;

hold monies for payment in trust;

recover excess money held by the debenture trustee;

compensate and indemnify the debenture trustee; and

appoint any successor trustee.

In order to exercise our rights to be discharged, we must deposit with the debenture trustee money or government obligations sufficient to pay all the principal of, any premium, if any, and interest on, the debt securities of the series on the dates payments are due.

Form, Exchange and Transfer

We will issue the debt securities of each series only in fully registered form without coupons and, unless we provide otherwise in the applicable prospectus supplement, in denominations of \$1,000 and any integral multiple thereof. The indentures provide that we may issue debt securities of a series in temporary or permanent global form and as book-entry securities that will be deposited with, or on behalf of, The Depository Trust Company, or DTC, or another depository named by us and identified in a prospectus supplement with respect to that series. See [Legal Ownership of Securities](#) for a further description of the terms relating to any book-entry securities.

Edgar Filing: MEDICINOVA INC - Form 424B5

At the option of the holder, subject to the terms of the indentures and the limitations applicable to global securities described in the applicable prospectus supplement, the holder of the debt securities of any series can exchange the debt securities for other debt securities of the same series, in any authorized denomination and of like tenor and aggregate principal amount.

Subject to the terms of the indentures and the limitations applicable to global securities set forth in the applicable prospectus supplement, holders of the debt securities may present the debt securities for exchange or for registration of transfer, duly endorsed or with the form of transfer endorsed thereon duly executed if so

20.

Table of Contents

required by us or the security registrar, at the office of the security registrar or at the office of any transfer agent designated by us for this purpose. Unless otherwise provided in the debt securities that the holder presents for transfer or exchange, we will impose no service charge for any registration of transfer or exchange, but we may require payment of any taxes or other governmental charges.

We will name in the applicable prospectus supplement the security registrar, and any transfer agent in addition to the security registrar, that we initially designate for any debt securities. We may at any time designate additional transfer agents or rescind the designation of any transfer agent or approve a change in the office through which any transfer agent acts, except that we will be required to maintain a transfer agent in each place of payment for the debt securities of each series.

If we elect to redeem the debt securities of any series, we will not be required to:

issue, register the transfer of, or exchange any debt securities of that series during a period beginning at the opening of business 15 days before the day of mailing of a notice of redemption of any debt securities that may be selected for redemption and ending at the close of business on the day of the mailing; or

register the transfer of or exchange any debt securities so selected for redemption, in whole or in part, except the unredeemed portion of any debt securities we are redeeming in part.

Information Concerning the Debenture Trustee

The debenture trustee, other than during the occurrence and continuance of an event of default under an indenture, undertakes to perform only those duties as are specifically set forth in the applicable indenture. Upon an event of default under an indenture, the debenture trustee must use the same degree of care as a prudent person would exercise or use in the conduct of his or her own affairs. Subject to this provision, the debenture trustee is under no obligation to exercise any of the powers given it by the indentures at the request of any holder of debt securities unless it is offered reasonable security and indemnity against the costs, expenses and liabilities that it might incur.

Payment and Paying Agents

Unless we otherwise indicate in the applicable prospectus supplement, we will make payment of the interest on any debt securities on any interest payment date to the person in whose name the debt securities, or one or more predecessor securities, are registered at the close of business on the regular record date for the interest.

We will pay principal of and any premium and interest on the debt securities of a particular series at the office of the paying agents designated by us, except that unless we otherwise indicate in the applicable prospectus supplement, we will make interest payments by check that we will mail to the holder or by wire transfer to certain holders. Unless we otherwise indicate in the applicable prospectus supplement, we will designate the corporate trust office of the debenture trustee in the City of New York as our sole paying agent for payments with respect to debt securities of each series. We will name in the applicable prospectus supplement any other paying agents that we initially designate for the debt securities of a particular series. We will maintain a paying agent in each place of payment for the debt securities of a particular series.

All money we pay to a paying agent or the debenture trustee for the payment of the principal of or any premium or interest on any debt securities that remains unclaimed at the end of two years after such principal, premium or interest has become due and payable will be repaid to us, and the holder of the debt security thereafter may look only to us for payment thereof.

Governing Law

The indentures and the debt securities will be governed by and construed in accordance with the laws of the State of New York, except to the extent that the Trust Indenture Act of 1939 is applicable.

Table of Contents

Subordination of Subordinated Debt Securities

The subordinated debt securities will be unsecured and will be subordinate and junior in priority of payment to certain of our other indebtedness to the extent described in a prospectus supplement. The subordinated indenture does not limit the amount of subordinated debt securities that we may issue, nor does it limit us from issuing any other secured or unsecured debt.

22.

Table of Contents

LEGAL OWNERSHIP OF SECURITIES

We can issue securities in registered form or in the form of one or more global securities. We describe global securities in greater detail below. We refer to those persons who have securities registered in their own names on the books that we or any applicable trustee or depositary or warrant agent maintain for this purpose as the holders of those securities. These persons are the legal holders of the securities. We refer to those persons who, indirectly through others, own beneficial interests in securities that are not registered in their own names, as indirect holders of those securities. As we discuss below, indirect holders are not legal holders, and investors in securities issued in book-entry form or in street name will be indirect holders.

Book-Entry Holders

We may issue securities in book-entry form only, as we will specify in the applicable prospectus supplement or free writing prospectus. This means securities may be represented by one or more global securities registered in the name of a financial institution that holds them as depositary on behalf of other financial institutions that participate in the depositary's book-entry system. These participating institutions, which are referred to as participants, in turn, hold beneficial interests in the securities on behalf of themselves or their customers.

Only the person in whose name a security is registered is recognized as the holder of that security. Global securities will be registered in the name of the depositary or its participants. Consequently, for global securities, we will recognize only the depositary as the holder of the securities, and we will make all payments on the securities to the depositary. The depositary passes along the payments it receives to its participants, which in turn pass the payments along to their customers who are the beneficial owners. The depositary and its participants do so under agreements they have made with one another or with their customers; they are not obligated to do so under the terms of the securities.

As a result, investors in a global security will not own securities directly. Instead, they will own beneficial interests in a global security, through a bank, broker or other financial institution that participates in the depositary's book-entry system or holds an interest through a participant. As long as the securities are issued in global form, investors will be indirect holders, and not holders, of the securities.

Street Name Holders

We may terminate a global security or issue securities that are not issued in global form. In these cases, investors may choose to hold their securities in their own names or in street name. Securities held by an investor in street name would be registered in the name of a bank, broker or other financial institution that the investor chooses, and the investor would hold only a beneficial interest in those securities through an account he or she maintains at that institution.

For securities held in street name, we or any applicable trustee or depositary will recognize only the intermediary banks, brokers and other financial institutions in whose names the securities are registered as the holders of those securities, and we or any such trustee or depositary will make all payments on those securities to them. These institutions pass along the payments they receive to their customers who are the beneficial owners, but only because they agree to do so in their customer agreements or because they are legally required to do so. Investors who hold securities in street name will be indirect holders, not holders, of those securities.

Legal Holders

Our obligations, as well as the obligations of any applicable trustee or third party employed by us or a trustee, run only to the legal holders of the securities. We do not have obligations to investors who hold beneficial interests in global securities, in street name or by any other indirect means. This will be the case whether an investor chooses to be an indirect holder of a security or has no choice because we are issuing the securities only in global form.

Table of Contents

For example, once we make a payment or give a notice to the holder, we have no further responsibility for the payment or notice even if that holder is required, under agreements with depository participants or customers or by law, to pass it along to the indirect holders but does not do so. Similarly, we may want to obtain the approval of the holders to amend an indenture, to relieve us of the consequences of a default or of our obligation to comply with a particular provision of an indenture, or for other purposes. In such an event, we would seek approval only from the legal holders, and not the indirect holders, of the securities. Whether and how the holders contact the indirect holders is up to the legal holders.

Special Considerations For Indirect Holders

If you hold securities through a bank, broker or other financial institution, either in book-entry form because the securities are represented by one or more global securities or in street name, you should check with your own institution to find out:

how it handles securities payments and notices;

whether it imposes fees or charges;

how it would handle a request for the holders' consent, if ever required;

whether and how you can instruct it to send you securities registered in your own name so you can be a holder, if that is permitted in the future;

how it would exercise rights under the securities if there were a default or other event triggering the need for holders to act to protect their interests; and

if the securities are global securities, how the depository's rules and procedures will affect these matters.

Global Securities

A global security is a security which represents one or any other number of individual securities held by a depository. Generally, all securities represented by the same global securities will have the same terms.

Each security issued in book-entry form will be represented by a global security that we issue to, deposit with and register in the name of a financial institution or its nominee that we select. The financial institution that we select for this purpose is called the depository. Unless we specify otherwise in the applicable prospectus supplement or a free writing prospectus, DTC will be the depository for all global securities issued under this prospectus.

A global security may not be transferred to or registered in the name of anyone other than the depository, its nominee or a successor depository, unless special termination situations arise. We describe those situations below under **Special Situations When a Global Security Will Be Terminated**. As a result of these arrangements, the depository, or its nominee, will be the sole registered owner and holder of all securities represented by a global security, and investors will be permitted to own only beneficial interests in a global security. Beneficial interests must be held by means of an account with a broker, bank or other financial institution that in turn has an account with the depository or with another institution that does. Thus, an investor whose security is represented by a global security will not be a holder of the security, but only an indirect holder of a beneficial interest in the global security.

If the prospectus supplement or a free writing prospectus for a particular security indicates that the security will be issued as a global security, then the security will be represented by a global security at all times unless and until the global security is terminated. If termination occurs, we may issue the securities through another book-entry clearing system or decide that the securities may no longer be held through any book-entry clearing system.

24.

Table of Contents

Special Considerations For Global Securities

As an indirect holder, an investor's rights relating to a global security will be governed by the account rules of the investor's financial institution and of the depository, as well as general laws relating to securities transfers. We do not recognize an indirect holder as a legal holder of securities and instead deal only with the depository that holds the global security.

If securities are issued only as a global security, an investor should be aware of the following:

An investor cannot cause the securities to be registered in his or her name, and cannot obtain non-global certificates for his or her interest in the securities, except in the special situations we describe below;

An investor will be an indirect holder and must look to his or her own bank or broker for payments on the securities and protection of his or her legal rights relating to the securities, as we describe above;

An investor may not be able to sell interests in the securities to some insurance companies and to other institutions that are required by law to own their securities in non-book-entry form;

An investor may not be able to pledge his or her interest in the global security in circumstances where certificates representing the securities must be delivered to the lender or other beneficiary of the pledge in order for the pledge to be effective;

The depository's policies, which may change from time to time, will govern payments, transfers, exchanges and other matters relating to an investor's interest in the global security. We and any applicable trustee have no responsibility for any aspect of the depository's actions or for its records of ownership interests in the global security. We and the trustee also do not supervise the depository in any way;

The depository may, and we understand that DTC will, require that those who purchase and sell interests in the global security within its book-entry system use immediately available funds, and your broker or bank may require you to do so as well; and

Financial institutions that participate in the depository's book-entry system, and through which an investor holds its interest in the global security, may also have their own policies affecting payments, notices and other matters relating to the securities. There may be more than one financial intermediary in the chain of ownership for an investor. We do not monitor and are not responsible for the actions of any of those intermediaries.

Special Situations When A Global Security Will Be Terminated

In a few special situations described below, a global security will terminate and interests in it will be exchanged for physical certificates representing those interests. After that exchange, the choice of whether to hold securities directly or in street name will be up to the investor. Investors must consult their own banks or brokers to find out how to have their interests in securities transferred to their own name, so that they will be direct holders. We have described the rights of holders and street name investors above.

A global security will terminate when the following special situations occur:

if the depository notifies us that it is unwilling, unable or no longer qualified to continue as depository for that global security and we do not appoint another institution to act as depository within 90 days;

if we notify any applicable trustee that we wish to terminate that global security; or

if an event of default has occurred with regard to securities represented by that global security and has not been cured or waived. The prospectus supplement or a free writing prospectus may also list additional situations for terminating a global security that would apply only to the particular series of securities covered by the prospectus supplement or a free writing prospectus. When a global security terminates, the depository, and not we or any applicable trustee, is responsible for deciding the names of the institutions that will be the initial direct holders.

Table of Contents

PLAN OF DISTRIBUTION

General Plan of Distribution

We may sell the securities in any of three ways (or in any combination): (a) to or through underwriters or dealers; (b) directly to a limited number of purchasers or to a single purchaser; or (c) through agents. The securities may be sold at-the-market to or through a market maker or into an existing trading market for the securities, on an exchange or otherwise. The prospectus supplement will set forth the terms of the offering of such securities, including:

the name or names of any underwriters, dealers or agents and the amounts of securities underwritten or purchased by each of them;
and

the offering price of the securities and the proceeds to us and any discounts, commissions or concessions allowed or reallocated or paid to dealers.

Any offering price and any discounts or concessions allowed or reallocated or paid to dealers may be changed from time to time.

If underwriters are used in the sale of any securities, the securities will be acquired by the underwriters for their own accounts and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. The securities may be either offered to the public through underwriting syndicates represented by managing underwriters, or directly by underwriters. Generally, the underwriters' obligations to purchase the securities will be subject to certain conditions precedent. The underwriters will be obligated to purchase all of the securities if they purchase any of the securities.

In compliance with the guidelines of the Financial Industry Regulatory Authority, the maximum compensation to the underwriters or dealers in connection with the sale of our securities pursuant to this prospectus and the accompanying supplement to this prospectus may not exceed 8 percent of the aggregate offering price of the securities as set forth on the cover page of any prospectus supplement.

We may sell the securities through agents from time to time. The prospectus supplement will name any agent involved in the offer or sale of the securities and any commissions we pay to them. Generally, any agent will be acting on a best efforts basis for the period of its appointment.

We may authorize underwriters, dealers or agents to solicit offers by certain purchasers to purchase the securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. The contracts will be subject only to those conditions set forth in the prospectus supplement, and the prospectus supplement will set forth any commissions we pay for soliciting these contracts.

Agents and underwriters may be entitled to indemnification by us against certain civil liabilities, including liabilities under the Securities Act or to contribution with respect to payments which the agents or underwriters may be required to make in respect thereof. Agents and underwriters may be customers of, engage in transactions with, or perform services for us in the ordinary course of business.

We may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open

Table of Contents

borrowings of stock. The third party in such sale transactions will be an underwriter and, if not identified in this prospectus, will be identified in the applicable prospectus supplement (or a post-effective amendment). We or one of our affiliates may loan or pledge securities to a financial institution or other third party that in turn may sell the securities using this prospectus. Such financial institution or third party may transfer its short position to investors in our securities or in connection with a simultaneous offering of other securities offered by this prospectus or otherwise.

Plan of Distribution for Shares of Common Stock Sold Pursuant to the Aspire Capital Agreement

We entered into the Aspire Capital Agreement with Aspire Capital on August 20, 2012. We issued 363,636 shares of our common stock to Aspire Capital in consideration for entering into the Aspire Capital Agreement. The Aspire Capital Agreement provides that, upon the terms and subject to the conditions set forth therein, Aspire Capital is irrevocably committed to purchase up to an aggregate of \$20 million of additional shares of our common stock (the "Purchase Shares") over the two year term of the Aspire Capital Agreement.

Pursuant to the Aspire Capital Agreement, we sold shares to Aspire Capital upon execution of the Aspire Capital Agreement for a purchase price of \$1,000,000. The Aspire Capital Agreement further provides that from time to time over the two year term of the Aspire Capital Agreement, on any business day on which the closing sale price of our common stock equals or exceeds \$1.00 per share, and at our sole discretion, we may present Aspire Capital with a purchase notice (the "Purchase Notice") directing Aspire Capital to purchase up to 50,000 Purchase Shares per business day at the Purchase Price on that day. We may mutually agree with Aspire Capital to increase the number of shares that may be sold per business day to as much as an additional 1,000,000 shares per business day. The purchase price per Purchase Share pursuant to such Purchase Notice (the "Purchase Price") is the lower of (i) the lowest sale price for our common stock on the date of sale or (ii) the arithmetic average of the three lowest closing sale prices for our common stock during the 12 consecutive business days ending on the business day immediately preceding the purchase date of those securities. The applicable Purchase Price is determined prior to delivery of any Purchase Notice.

In addition, on any date on which we submit a 50,000 share Purchase Notice to Aspire Capital, we also have the right, in our sole discretion, to present Aspire Capital with a VWAP Purchase Notice directing Aspire Capital to purchase an amount of common stock equal to up to 15% of the aggregate shares of our common stock traded on Nasdaq on the VWAP Purchase Date, subject to the VWAP Minimum Price Threshold and the VWAP Purchase Share Volume Maximum.

Aspire Capital may be an "underwriter" within the meaning of the Securities Act.

Neither we nor Aspire Capital can presently estimate the amount of compensation that any agent will receive. We know of no existing arrangements between Aspire Capital, any other shareholder, broker, dealer, underwriter, or agent relating to the sale or distribution of the shares offered by this prospectus or any other prospectus or prospectus supplement related to the Aspire Capital Agreement.

We will pay all of the expenses incident to the registration, offering and sale of the shares to Aspire Capital. We have agreed to indemnify Aspire Capital and certain other persons against certain liabilities in connection with the offering of shares of common stock offered by this prospectus or any other prospectus or prospectus supplement related to the Aspire Capital Agreement or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities.

Aspire Capital and its affiliates have agreed not to engage in any direct or indirect short selling or hedging of our common stock during the term of the Aspire Capital Agreement.

Table of Contents

LEGAL MATTERS

The validity of the securities offered by this prospectus will be passed upon for us by Cooley LLP, San Diego, California.

EXPERTS

The consolidated financial statements of MediciNova, Inc. appearing in MediciNova, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2011, and the effectiveness of MediciNova, Inc.'s internal control over financial reporting as of December 31, 2011 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon, incorporated by reference therein, and incorporated herein by reference. For the period from September 26, 2000 (inception) through December 31, 2011, the audit report is based in part on the report of KPMG LLP, independent registered public accounting firm, as to the years 2010 and 2009. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

The consolidated financial statements of Medicinova Inc. as of December 31, 2010 and for each of the years in the two-year period ended December 31, 2010, appearing in MediciNova, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2011, have been incorporated by reference herein in reliance upon the report of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

INCORPORATION BY REFERENCE

We incorporate by reference certain documents that we have filed with the SEC into this prospectus, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is deemed to be part of this prospectus, except for any information superseded by information contained directly in this prospectus. This prospectus incorporates by reference our:

Annual report on Form 10-K for the year ended December 31, 2011 filed with the SEC on March 29, 2012;

Quarterly report on Form 10-Q for the quarters ended March 31, 2012, June 30, 2012 and September 30, 2012 filed with the SEC on May 10, 2012, August 9, 2012 and November 8, 2012, respectively;

Current reports on Form 8-K filed with the SEC on February 15, 2012, March 22, 2012, April 11, 2012, June 18, 2012, July 5, 2012, August 21, 2012 and August 22, 2012 (other than the portions of these reports furnished but not filed pursuant to SEC rules and the exhibits filed on such form that relate to such portions);

the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2011 from our definitive proxy statement on Schedule 14A, filed with the SEC on April 30, 2012; and

Registration Statement on Form 8-A filed with the SEC on January 26, 2005 and November 29, 2006.

We incorporate by reference the documents listed above and any future filings made by us with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the initial filing of the registration statement that contains this prospectus and prior to the termination of the offering of securities described in this prospectus;

Table of Contents

provided, however, that notwithstanding the foregoing, unless specifically stated to the contrary, none of the information that is not deemed filed with the SEC, including information furnished under Items 2.02 or 7.01 of any Current Report on Form 8-K, will be incorporated by reference into, or otherwise included in, this prospectus.

These documents may also be accessed on our website at www.medicinova.com. Information contained in, or accessible through, our website is not a part of this prospectus.

You may obtain documents incorporated by reference into this prospectus at no cost by writing or telephoning us at the following address:

MediciNova, Inc.

Attention: Michael Gennaro, Chief Financial Officer

4350 La Jolla Village Drive, Suite 950

San Diego, CA 92122

Tel: (858) 373-1500

Any statements contained in a document incorporated by reference in this prospectus shall be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus (or in any other subsequently filed document which also is incorporated by reference in this prospectus) modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed to constitute a part of this prospectus except as so modified or superseded.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended, and file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any reports, proxy statements and other information we file at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. You may also access filed documents at the SEC's web site at www.sec.gov.

Table of Contents

\$30,000,000

Common Stock

MEDICINOVA, INC.

Prospectus Supplement

May 22, 2015