

MEDICINOVA INC  
Form 424B5  
March 24, 2011  
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Filed Pursuant to Rule 424(b)(5)  
Registration No. 333-163116

**PROSPECTUS SUPPLEMENT**

(to the Prospectus dated December 16, 2009)

**MEDICINOVA, INC.**  
**Units Consisting of**  
**2,750,000 Shares of Common Stock and**  
**Warrants to Purchase 2,750,000 Shares of Common Stock**

We are offering 2,750,000 units, with each unit consisting of one share of common stock and a warrant to purchase one share of common stock, pursuant to this prospectus supplement and the accompanying prospectus. The purchase price for each unit is \$3.00. Each warrant will have an exercise price of \$3.56 per share, will be exercisable immediately upon issuance and will expire five years from the date of issuance. Units will not be issued or certificated. The shares of common stock and the warrants are immediately separable and will be issued separately, but will be purchased together in this offering.

Our common stock is quoted on the NASDAQ Global Market under the symbol MNOV and on the Jasdaq Market (formerly the Hercules Market until its closure in 2010) of the Osaka Securities Exchange under the code 4875. On March 23, 2011, the last reported sale price of our common stock on the NASDAQ Global Market was \$3.56. There is no established public trading market for the warrants and we do not expect a market to develop. In addition, we do not intend to apply for listing of the warrants on any securities exchange.

**This investment involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading Risk Factors beginning on page S-6 of this prospectus supplement.**

	Per Unit	Total Amount
Public offering price	\$ 3.00	\$ 8,250,000
Underwriting discount (1)	\$ 0.15	\$ 412,500
Proceeds, before expenses, to us	\$ 2.85	\$ 7,837,500

- (1) Does not include a non-accountable expense allowance in the amount of 1% of the gross proceeds of the offering, excluding any over-allotment proceeds. See Underwriting.

The underwriter may also purchase up to an additional 412,500 units from us at the public offering price, less the underwriting discount, within 30 days following the date of this prospectus supplement to cover overallotments, if any. The above summary of offering proceeds to us does not give effect to any exercise of the warrants being issued in this offering.

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

The units are being offered and sold on a firm-commitment basis. The underwriter expects to deliver the units against payment on or about March 29, 2011.

## **Ladenburg Thalmann & Co. Inc.**

**The date of this prospectus supplement is March 24, 2011.**

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**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, 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 rely only on the information contained in, or incorporated by reference into, this prospectus supplement and contained in, or incorporated by reference into, 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.

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**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 diseases with unmet medical need 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, each of which we believe has a well-characterized and differentiated therapeutic profile, attractive commercial potential and patent assets having claims of commercially adequate scope. 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 was AV411, a macrophage migration inhibitory factor and a glial attenuator for central nervous system, or CNS, disorders, such as neuropathic pain, opioid withdrawal and methamphetamine addiction.

We believe that our ability to gain access to and acquire potentially high-value product candidates from Japanese and European pharmaceutical companies is largely attributable to the established relationships and broad industry experience of our management team. In particular, we believe our relationships with Japanese pharmaceutical companies and their executives provide us with a competitive advantage in opportunistically sourcing product candidates from Japanese pharmaceutical companies at attractive terms. Since our inception, we have established relationships with a number of pharmaceutical companies, including Kissei Pharmaceutical Co., Ltd., or Kissei Pharmaceutical, Kyorin Pharmaceutical Co., Ltd., or Kyorin Pharmaceutical, Mitsubishi Tanabe Pharma Corporation and Meiji Seika Kaisha, Ltd., or Meiji Seika Kaisha, in Japan and Angiogene Pharmaceuticals, Ltd., or Angiogene Pharmaceuticals, in the United Kingdom, pursuant to which we have obtained rights to develop and commercialize our current product candidates.

Since our inception, we have acquired licenses to eight compounds for the development of ten product candidates in what we believe are large and underserved markets. Our development pipeline consists of eight product development programs which have been in clinical development for the treatment of asthma, acute exacerbations of asthma, diabetic neuropathic pain, opioid addiction, multiple sclerosis, or MS, interstitial cystitis, or IC, solid tumor cancers, Generalized Anxiety Disorder/insomnia, preterm labor and urinary incontinence. Our two earlier stage product development programs have been in preclinical development for the treatment of thrombotic disorders. In addition, we have expanded the development program for one of our prioritized product candidates, MN-221, to evaluate MN-221 for the treatment of Chronic Obstructive Pulmonary Disease, or COPD, exacerbations.

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

**Product**

<b>Candidate</b>	<b>Disease/Indication</b>	<b>Phase of Development</b>	<b>Licensors</b>	<b>Licensed Territory</b>
MN-221	Acute exacerbations of asthma and COPD exacerbations	Phase II clinical trial in emergency rooms at planned escalating doses in patients with severe, acute exacerbations of asthma completed in Q2, 2009	Kissei  Pharmaceutical	Worldwide, except  Japan*
		Phase II clinical trial in emergency rooms to evaluate safety and efficacy in patients with severe, acute exacerbations of asthma initiated in Q1, 2009 and ongoing; expected to be completed in the second half of 2011		
		Phase Ib clinical trial to evaluate the safety and efficacy in patients with stable, moderate to severe COPD completed in Q1, 2010		
MN-166/ AV411**	CNS disorders***	Phase II clinical trial completed in Q2, 2008	Kyorin  Pharmaceutical (MN-166)	Worldwide, except Japan, China, Taiwan and South Korea (MN-166)
		Prototype once-per-day oral formulation developed for future clinical trials		
		Phase Ib/IIa clinical trial in diabetic neuropathic pain completed in Q4, 2007		
		Phase Ib National Institute on Drug Abuse, or NIDA, funded clinical trial in methamphetamine-dependent volunteers initiated in Q4, 2010		
		Phase Ib/IIa NIDA-funded clinical trial to evaluate safety and efficacy in heroin-dependent volunteers completed in Q4, 2010		

- \* Pursuant to our license agreement with Kissei Pharmaceutical, Kissei Pharmaceutical has the right to co-promote licensed products in our territory on terms to be agreed upon by the parties. On March 3, 2011, we executed a joint venture agreement with Zhejiang Medicine Co., Ltd. and Beijing Make-Friend Medicine Technology Co., Ltd., which provides for the establishment of a joint venture company to develop and commercialize MN-221 in China.
- \*\* MN-166 and AV411 are both ibudilast, an orally available, small molecule therapeutic. With the acquisition of AV411, we are integrating the two ibudilast-based product development programs and pursuing discussions with potential partners to secure a strategic collaboration to advance clinical development of the combined development programs. Our rights to MN-166 licensed from Kyorin Pharmaceutical exclude ophthalmic solution formulations.  
AV411 has advanced through multiple Phase I and IIa clinical trials in healthy volunteers and patients with neuropathic pain.
  
- \*\*\* CNS disorders encompass MS, neuropathic pain, opioid addiction and withdrawal and methamphetamine addiction.

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Upon completion of proof-of-concept Phase II clinical trials, we intend to enter into strategic alliances with leading pharmaceutical or biotech companies to support further clinical development, and plan to keep certain commercialization rights in select markets. In addition, we continue to limit development activities for the balance of our existing product candidates in order to focus on our prioritized programs. For each of these remaining product candidates, we plan to conduct development activities only to the extent deemed necessary to maintain our license rights or maximize its value while pursuing a variety of initiatives to monetize such product candidate on appropriate terms. We cannot assure you that we will be successful in monetizing these product candidates on attractive terms, or at all, or that we will be able to form successful strategic alliances to permit further clinical development of our prioritized product development programs. See *Risk Factors*.

## **Recent Developments**

The audit of our financial statements as of and for the year ended December 31, 2010 has not yet been completed. Based on preliminary unaudited financial results, we do not expect to recognize any revenue for the quarter and year ended December 31, 2010. We expect to recognize a net loss of approximately \$5.0 million for the quarter ended December 31, 2010, or \$0.40 per share, and a net loss of approximately \$20.2 million for the year ended December 31, 2010, or \$1.63 per share. As of December 31, 2010, we expect cash and cash equivalents on hand to be approximately \$28.3 million, which will not be sufficient to meet our operating requirements and debt repayment obligations through December 31, 2011. Restricted cash of approximately \$28.7 million, however, is expected to be sufficient to cover our convertible debt obligations maturing on June 18, 2011. These estimated financial results, as set forth in this paragraph, are preliminary and subject to completion of the year-end audit.

On March 3, 2011, we executed a joint venture agreement with Zhejiang Medicine Co., Ltd. and Beijing Make-Friend Medicine Technology Co., Ltd., which provides for the establishment of a joint venture company to develop and commercialize MN-221 in China. The agreement provides that the business scope of the joint venture company will be to in-license authorized drug candidates from us, manage and operate a facility to manufacture such drug candidates for the Chinese market and promote, distribute and sell such drug candidates in the Chinese market. The joint venture company will also be responsible for conducting all clinical trials necessary to gain regulatory approval in China. The joint venture company will initially conduct the activities described above with respect to MN-221; however other drug candidates may be brought within the scope if the parties to the agreement unanimously agree. We will contribute 4,290,000 RMB in cash for a 30% interest in the joint venture. Our responsibilities relate to granting rights to MN-221 in China to the joint venture, while the other parties are responsible for providing funding for the joint venture's activities. We will receive a license fee payment equal to our capital contribution for the license to MN-221. Any amendment requires the written agreement of all three parties thereto.

## **Company Information**

We were originally incorporated in 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. Our telephone number is (858) 373-1500. Our website is [www.medicinova.com](http://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.



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**The Offering**

Common stock offered by us	2,750,000 shares
Warrants offered by us	Warrants to purchase 2,750,000 shares of our common stock. This prospectus supplement also relates to the offering of the shares of our common stock issuable upon exercise of the warrants.
Common stock to be outstanding after this offering	15,175,479 shares (assuming none of the warrants issued in this offering are exercised).
Risk Factors	Our business and an investment in our securities include significant risks. See <b>Risk Factors</b> beginning on page S-6.
Use of proceeds	We intend to use the net proceeds from the sale of securities under this prospectus supplement to fund our research and development efforts, and for general corporate purposes, including working capital. We may also use a portion of the net proceeds from this sale 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. See <b>Use of Proceeds</b> on page S-33.
Listing	Our common stock is listed on the NASDAQ Global Market under the trading symbol <b>MNOV</b> . There is no established public trading market for the offered warrants and we do not expect a market to develop. In addition, we do not intend to apply for listing of the warrants on any securities exchange.

The number of shares of common stock to be outstanding immediately after this offering as shown above is based on 12,425,479 shares of common stock outstanding as of the close of business on September 30, 2010. This number excludes, as of the close of business on September 30, 2010:

1,538,804 shares of common stock reserved for the exercise of options outstanding at a weighted average exercise price of \$9.78;

1,749,974 shares of common stock reserved for issuance under our stock incentive programs;

198,020 shares of common stock reserved for the exercise of a warrant outstanding at an exercise price of \$6.06;

259,127 shares of common stock reserved for issuance under our employee stock purchase program; and

4,172,746 shares of common stock reserved for issuance upon conversion of \$28,374,672.92 in principal of outstanding convertible notes.

Unless otherwise indicated, this prospectus supplement reflects and assumes no exercise by the underwriter of its overallotment option.

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**RISK FACTORS**

An investment in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks described below, together with the other information in this prospectus supplement, the accompanying prospectus, the information and documents incorporated by reference, and in any free writing prospectus that we have authorized for use in connection with this offering. If any of these risks actually occur, our business, financial condition, results of operations or cash flows could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. The risks described below and in the documents referenced above are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also affect our business operations.

**Risks Related to Our Business and Industry**

*We have incurred significant operating losses since our inception and expect that we will incur continued losses for the foreseeable future.*

We are a development stage biopharmaceutical company with a limited operating history. We have incurred significant net losses since our inception. For the three months and nine months ended September 30, 2010, we had a net loss of \$5.7 million and \$15.2 million, respectively and our accumulated deficit was approximately \$262.5 million. If we are successful in securing a strategic collaboration or in raising additional capital to support the expansion of our business, our annual net losses may increase over the next several years as we expand our infrastructure and incur significant costs related to the development of our product candidates.

If we have taxable income in the future, utilization of the net operating losses, or NOL, and tax credit carryforwards will be subject to a substantial annual limitation under Section 382 and 383 of the Internal Revenue Code of 1986, and similar state provisions due to ownership change limitations that have occurred. These ownership changes will limit the amount of NOL and tax credit carryforwards that can be utilized to offset future taxable income and tax, respectively.

Our existing cash and cash equivalents at September 30, 2010 will not be sufficient to meet our operating requirements and debt repayment obligations through December 31, 2011. Our existing cash and cash equivalent resources, together with the estimated net proceeds of this offering, of approximately \$7.5 million as set forth in Use of Proceeds, are anticipated to be sufficient to fund our operating requirements and debt repayment obligations through December 31, 2011 and, with certain cost reduction measures employed in the first quarter of 2012, through March 31, 2012. As of September 30, 2010, we have adequate cash set aside to fund the repayment of our existing loan from Oxford Finance Corporation, or Oxford, and the payment of convertible notes that become due on June 18, 2011, but after using this cash and our restricted cash, we estimate that we would only have sufficient cash to fund operations through July 2011, assuming we do not complete this offering. We have based our cash estimates primarily on our assumptions related to when our on-going clinical trial for MN-221 set in the emergency department will be completed.

These assumptions may prove to be wrong, and we could spend our available financial resources before we complete the MN-221 clinical trial. Our future capital requirements will also depend on many factors, including:

our success in completing this offering;

progress in, and the costs of, future planned clinical trials and other research and development activities;

the scope, prioritization and number of our product development programs;

our obligations under our license agreements, pursuant to which we may be required to make future milestone payments upon the achievement of various milestones related to clinical, regulatory or commercial events;

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our ability to establish and maintain strategic collaborations, including licensing and other arrangements, and to complete acquisitions of additional product candidates;

the time and costs involved in obtaining regulatory approvals;

the costs of securing manufacturing arrangements for clinical or commercial production of our product candidates;

the costs associated with expanding our management, personnel, systems and facilities;

the costs associated with any litigation;

the costs associated with the operations or wind-down of any business we may acquire;

the costs involved in filing, prosecuting, enforcing and defending patent claims and other intellectual property rights; and

the costs of establishing or contracting for sales and marketing capabilities and commercialization activities if we obtain regulatory approval to market our product candidates.

We expect our research and development expenses to increase in connection with ongoing and planned clinical trials primarily related to MN-221 for the treatment of acute exacerbations of asthma and COPD exacerbations, and any other development activities that we may initiate. In addition, our general and administrative expenses may increase in future periods as a result of several factors, including our research and development activities, our business development activities and any expansions in our infrastructure related to such activities. Consequently, we expect to continue to incur significant and increasing operating losses for the foreseeable future. Because of the numerous risks and uncertainties associated with developing drug products, we are unable to predict the extent of any future losses or when we will become profitable, if at all.

***If we fail to obtain the capital necessary to fund our operations, we will be unable to develop and commercialize our product candidates.***

We have consumed substantial amounts of capital since our inception. From our inception to September 30, 2010, we had an accumulated deficit of \$262.5 million. Our cash, cash equivalents and investment securities were approximately \$32.0 million at September 30, 2010.

Our overall liquidity position over the next twelve months is still under review by our independent registered public accounting firm and, even with the estimated net proceeds that we are raising in this offering, of approximately \$7.5 million as set forth in Use of Proceeds, the report from our independent registered public accounting firm for the year ended December 31, 2010 may conclude that we are unable to continue as a going concern at December 31, 2011. Unless we raise additional funds in the near future, we may not have sufficient cash and other liquidity to fund our operations as currently conducted for the following 12 months. We may have to implement additional cost reducing measures and ultimately, if we are unable to obtain additional financing on commercially reasonable terms, we may be unable to continue as a going concern. If we cannot continue as a going concern, we may be required to cease operations and to liquidate our assets and may receive less than the value at which those assets are carried on our consolidated financial statements, and it is likely that existing stockholders will lose all or part of their investment.

Even with the estimated \$7.5 million in net proceeds from this offering, we have had, and expect to have for the foreseeable future, negative cash flows from operations. Our business will continue to require us to incur substantial research and development expenses and we do not expect to be able to fund these expenses solely from upfront cash or milestones from collaborations or strategic alliances. We may be required to raise capital from one or more sources in the near term to continue our operations at or close to the levels currently conducted. We believe that without raising additional capital soon from accessible sources of financings, we will not otherwise have adequate funding to complete the development of MN-221 including pivotal clinical trials or the



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commercialization of any products we successfully develop. Our business plan assumes that we will use approximately \$15.2 million of our existing cash resources to fund repayment of our loan from Oxford on March 31, 2011 in anticipation of the acceleration of the loan on such date as a result of our failure to achieve certain affirmative covenants set forth in the Loan Agreement. We also have assumed that all of our restricted cash will be used to pay our convertible notes that mature on June 18, 2011, although one or more holders may elect to convert some or all of the convertible notes to common stock at a conversion rate of \$6.80 per share prior to the maturity date. There is no guarantee that adequate funds will be available when needed from additional debt or equity financing, arrangements with partners, or from other sources, or on terms attractive to us. The inability to obtain sufficient additional funds when needed to fund our operations would require us to significantly delay, scale back, or eliminate some or all of our clinical or regulatory activities, further reduce general and administrative expenses and have a substantial negative effect on our results of operations and financial condition.

***We do not have any products that are approved for commercial sale and therefore do not expect to generate any revenues from product sales in the foreseeable future, if ever.***

To date, we have funded our operations primarily from sales of our securities and, to a lesser extent, debt financing. We have not received, and do not expect to receive for at least the next several years, if at all, any revenues from the commercialization of our product candidates. Our only source of revenues since inception has been from development management services rendered to Asahi Kasei Pharma Corporation and Argenes, Inc., both Japanese pharmaceutical companies, in connection with their clinical development of pharmaceutical product candidates. We completed our agreement with Asahi Kasei Pharma Corporation and terminated our agreement with Argenes, Inc.; therefore, we will not generate any further revenues from these agreements. We anticipate that, prior to our commercialization of a product candidate, out-licensing up-front and milestone payments will be our primary source of revenue if we can enter into collaborations, strategic alliances or other agreements that would provide us with such revenues. To obtain revenues from sales of our product candidates, we must succeed, either alone or with third parties, in developing, obtaining regulatory approval for, manufacturing and marketing drugs with commercial potential. We may never succeed in these activities, and we may not generate sufficient revenues to continue our business operations or achieve and maintain profitability.

***We are largely dependent on the success of our two prioritized product candidates, MN-221 and MN-166/AV411, and we cannot be certain that either of these product candidates will receive regulatory approval or be successfully commercialized.***

We currently have no products for sale, and we cannot guarantee that we will ever have any drug products approved for sale. The research, testing, manufacturing, labeling, approval, selling, marketing and distribution of drug products are subject to extensive regulation by the FDA and comparable regulatory authorities in other countries. We are not permitted to market any of our product candidates in the United States until we submit and receive approval of a New Drug Application, or NDA, for a product candidate from the FDA or its foreign equivalent from a foreign regulatory authority. Obtaining FDA approval is a lengthy, expensive and uncertain process. We currently have two prioritized product candidates, MN-221 for the treatment of acute exacerbations of asthma and COPD exacerbations and MN-166/AV411, a combined ibudilast product development program covering MS and other CNS disorders, and the success of our business currently depends on their successful development and commercialization. Neither of these product candidates has completed the clinical development process; therefore, we have not submitted an NDA or foreign equivalent or received marketing approval for either of these two prioritized product candidates. In addition, we are not currently planning to fund any further significant clinical development of MN-166/AV411 until such time that we are able to secure a strategic collaboration to advance the combined development programs, which may delay or impede the process of completing clinical trials and seeking regulatory approval for this product candidate. We also cannot assure you that we will be able to secure such a strategic collaboration on attractive financial and other terms, or at all.

The clinical development programs for MN-221 and MN-166/AV411 may not lead to commercial products for a number of reasons, including our clinical trials' failure to demonstrate to the FDA's satisfaction that these

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product candidates are safe and effective or our failure to obtain necessary approvals from the FDA or similar foreign regulatory authorities for any reason. We may also fail to obtain the necessary approvals if we have inadequate financial or other resources to advance our product candidates through the clinical trial process or are unable to secure a strategic collaboration or partnership with a third party. Any failure or delay in completing clinical trials or obtaining regulatory approval for either MN-221 or MN-166/AV411 in a timely manner would have a material and adverse impact on our business and our stock price.

***In order to commercialize a therapeutic drug successfully, a product candidate must receive regulatory approval after the successful completion of clinical trials, which are long, complex and costly, have a high risk of failure and can be delayed or terminated at any time.***

Our product candidates are subject to extensive government regulations related to development, clinical trials, manufacturing and commercialization. The process of obtaining FDA and other regulatory approvals is costly, time-consuming, uncertain and subject to unanticipated delays. To receive regulatory approval for the commercial sale of any of our product candidates, we must conduct, at our own expense, adequate and well-controlled clinical trials in human patients to demonstrate the efficacy and safety of the product candidate. Clinical testing is expensive, takes many years and has an uncertain outcome. To date, we have obtained regulatory authorization to conduct clinical trials for eight of our product development programs. Investigational New Drug Applications, or INDs, were approved by the FDA and are active for seven of our product candidates. We also have obtained Clinical Trial Authorizations, or CTAs, for the ongoing Phase II clinical trial for MN-221 in Canada, Australia and New Zealand. Through the acquisition of Avigen, we have assumed responsibility for AV411 clinical trials including one active IND for neuropathic pain and cross-reference and drug product support of the NIDA-funded opioid withdrawal investigator-initiated IND with Columbia University drug addiction clinical researchers. In the third quarter of 2010, a NIDA-funded investigator-initiated IND with University of California Los Angeles was given approval by the FDA to proceed with an initial trial of our neurological drug candidate, ibudilast (MN-166/AV411), as a potential new pharmacotherapy for methamphetamine addiction. The study will be led by established clinical research investigators in the treatment of drug addiction.

It may take years to complete the clinical development necessary to commercialize a drug, and delays or failure can occur at any stage, which may result in our inability to market and sell any products derived from any of our product candidates that are ultimately approved by the FDA or foreign regulatory authorities. Our clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical and/or non-clinical testing. For example, in October 2007, we announced that our Phase II clinical trial of MN-305 for the treatment of insomnia failed to achieve statistical significance in its primary endpoint, and, as a result, we terminated development of MN-305 for the treatment of insomnia. Of the large number of drugs in development, only a small percentage result in the submission of an NDA to the FDA and even fewer are approved for commercialization. Interim results of clinical trials do not necessarily predict final results, and success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful. A number of companies in the pharmaceutical industry have suffered significant setbacks in advanced clinical trials even after promising results in earlier clinical trials. In addition, any delays in completing clinical trials or the rejection of data from a clinical trial by a regulatory authority will result in increased development costs and could have a material adverse effect on the development of the impacted product candidate.

In connection with the conduct of clinical trials for each of our product candidates, we face many risks, including the risks that:

the product candidate may not prove to be effective in treating the targeted indication;

patients may die or suffer other adverse effects for reasons that may or may not be related to the product candidate being tested;

the results may not confirm the positive results of earlier trials;

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the FDA or other regulatory authorities may not agree with our proposed development plans or accept the results of completed clinical trials; and

our planned clinical trials and the data collected from such clinical trials may be deemed by the FDA or other regulatory authorities not to be sufficient, which would require additional development for the product candidate before it can be evaluated in late stage clinical trials or before the FDA will consider an application for marketing approval.

If we do not complete clinical development of our product candidates successfully, we will be unable to obtain regulatory approval to market products and generate revenues from such product candidates. We may also fail to obtain the necessary regulatory approvals if we have inadequate financial or other resources to advance our product candidates through the clinical trial process. In addition, even if we believe that the preclinical and clinical data are sufficient to support regulatory approval for a product candidate, the FDA and foreign regulatory authorities may not ultimately approve such product candidate for commercial sale in any jurisdiction, which would limit our ability to generate revenues and adversely affect our business. In addition, even if our product candidates receive regulatory approval, they remain subject to ongoing FDA regulations, including obligations to conduct additional clinical trials, changes to the product label, new or revised regulatory requirements for manufacturing practices, written advisements to physicians, and/or a product recall or withdrawal.

***Delays in the commencement or completion of clinical trials, or suspension or termination of our clinical trials, could result in increased costs to us and delay or limit our ability to obtain regulatory approval for our product candidates.***

If we experience delays in the commencement or completion of our clinical trials, we could incur significantly higher product development costs and our ability to obtain regulatory approvals for our product candidates could be delayed or limited. The commencement and completion of clinical trials requires us to identify and maintain a sufficient number of study sites and enroll a sufficient number of patients at such sites. We do not know whether enrollment in our ongoing and planned clinical trials for our product candidates will be completed on time, or whether our additional planned and ongoing clinical trials for our product candidates will be completed on schedule, if at all. For example, through the third quarter of 2010 we continued to experience an overall slower than anticipated enrollment of patients for our ongoing Phase II clinical trial evaluating the safety and efficacy of MN-221 in patients with severe, acute exacerbations of asthma for various reasons such as the length of time required to stay in the emergency room, or ER, during the treatment period. Our enrollment rates have improved since September 30, 2010, we believe, due in part to changes to the protocol that shortened the length of time the patient needed to stay in the ER and that gave the ER physician control over the standard of care that was given to the patient during the treatment period. However, there is no assurance that we will complete enrollment in the second half of 2011.

The commencement and completion of clinical trials can be delayed for a variety of other reasons, including delays in:

obtaining regulatory approval to commence or amend a clinical trial;

reaching agreements on acceptable terms with prospective clinical research organizations, or CROs, and trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;

recruiting and enrolling patients to participate in clinical trials;

retaining patients who have initiated a clinical trial but who may be prone to withdraw due to the treatment protocol, lack of efficacy, personal issues or side effects from the therapy or who are lost to further follow-up;

manufacturing sufficient quantities of a product candidate; and

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IRB approval or approval from foreign counterparts to conduct or amend a clinical trial at a prospective site.

In addition, a clinical trial may be delayed, suspended or terminated by us, the FDA or other regulatory authorities due to a number of factors, including:

ongoing discussions with regulatory authorities regarding the scope or design of our clinical trials or requests by them for supplemental information with respect to our clinical trial results, which may result in the imposition of a clinical hold on the IND for any clinical trial, as well as the inability to resolve any outstanding concerns with the FDA so that a clinical hold already placed on the IND may be lifted and the clinical trial may begin;

inspections of our own clinical trial operations, the operations of our CROs or our clinical trial sites by the FDA or other regulatory authorities, which may result in the imposition of a clinical hold or potentially prevent us from using some of the data generated from our clinical trials to support requests for regulatory approval of our product candidates;

our failure or inability, or the failure or inability of our CROs, clinical trial site staff or other third party service providers involved in the clinical trial, to conduct clinical trials in accordance with regulatory requirements or our clinical protocols;

lower than anticipated enrollment or retention rates of patients in clinical trials;

new information suggesting unacceptable risk to subjects or unforeseen safety issues or any determination that a trial presents unacceptable health risks;

insufficient supply or deficient quality of product candidates or other materials necessary for the conduct of our clinical trials; and

lack of adequate funding to continue the clinical trial, including the incurrence of unforeseen costs due to enrollment delays, requirements to conduct additional trials and studies and increased expenses associated with the services of our CROs and other third parties.

If we experience delays in the completion of our clinical trials for a product candidate, the commercial prospects for such product candidate may be harmed, we may incur increased costs for development of such product candidate and our ability to obtain regulatory approval for such product candidate could be delayed or limited. Many of the factors that cause or lead to delays in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval for a product candidate. In addition, any amendment to a clinical trial protocol may require us to resubmit our clinical trial protocols to IRBs or their foreign counterparts for reexamination, which may delay or otherwise impact the costs, timing or successful completion of a clinical trial.

***The loss of any rights to develop and market any of our product candidates could significantly harm our business.***

With the exception of AV411, we license the rights to develop and market our product candidates. Currently, we have licensed rights relating to eight compounds for the development of ten product candidates.

We are obligated to develop and commercialize these product candidates in accordance with mutually agreed upon terms and conditions. Our ability to satisfy some or all of the terms and conditions of our license agreements is dependent on numerous factors, including some factors that are outside of our control. Any of our license agreements may be terminated if we breach our obligations under the agreement materially and fail to cure any such breach within a specified period of time.

If any of our license agreements is terminated, we would have no further rights to develop and commercialize the product candidate that is the subject of the license. The termination of the license agreements





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related to either of our two prioritized product candidates would significantly and adversely affect our business. The termination of any of the remainder of our license agreements could materially and adversely affect our business.

***If our competitors develop and market products that are more effective than our product candidates, they may reduce or eliminate our commercial opportunities.***

The biotechnology and pharmaceutical industries are subject to rapid and intense technological change. We face, and will continue to face, competition from pharmaceutical and biotechnology companies, as well as numerous academic and research institutions and governmental agencies, in the United States and abroad. Some of these competitors have products or are pursuing the development of drugs that target the same diseases and conditions that are the focus of our product development programs. We cannot assure you that developments by others will not render our product candidates obsolete or noncompetitive. Many of our competitors have products that have been approved or are in advanced development and may succeed in developing drugs that are more effective, safer, more affordable or more easily administered than ours, or that achieve patent protection or commercialization sooner than our products. Our competitors may also develop alternative therapies that could further limit the market for any products that we are able to obtain approval for, if at all. In addition, new developments, including the development of other drug technologies and methods of preventing the incidence of disease, occur in the pharmaceutical industry at a rapid pace. These developments may render our product candidates obsolete or noncompetitive.

In many of our target disease areas, potential competitors are working to develop new compounds with different mechanisms of action and attractive efficacy and safety profiles. Many of our competitors have substantially greater financial, research and development resources, including personnel and technology, clinical trial experience, manufacturing, sales and marketing capabilities and production facilities than we do. Smaller companies also may prove to be significant competitors, particularly through proprietary research discoveries and collaboration arrangements with large pharmaceutical and established biotechnology companies.

Our competitors may obtain regulatory approval of their products more rapidly than we are able to or may obtain patent protection or other intellectual property rights that limit our ability to develop or commercialize our product candidates. Our competitors may also develop drugs that are more effective and less costly than ours and may also be more successful than us in manufacturing and marketing their products. We also expect to face similar competition in our efforts to identify appropriate collaborators or partners to help develop or commercialize our product candidates.

***We will depend on strategic collaborations with third parties to develop and commercialize selected product candidates and will not have control over a number of key elements relating to the development and commercialization of these product candidates if we are able to achieve such third-party arrangements.***

A key aspect of our strategy is to seek collaborations with partners, such as large pharmaceutical companies, that are willing to conduct later-stage clinical trials and further develop and commercialize selected product candidates. Following completion of the Phase II clinical trial for MN-166 for the treatment of MS in the second quarter of 2008 and the acquisition of AV411 in December 2009, we do not plan to undertake any further significant clinical development activities for any of our product candidates other than MN-221 for the treatment of acute exacerbations of asthma and COPD exacerbations, other than those activities deemed necessary to maximize each product candidate's value, until such time that we are successful in entering into a partnership or collaboration to further development of such product candidates. To date, we have not entered into any such collaborative arrangements, and we may not be able to enter into any collaborations or otherwise monetize these product candidates on acceptable terms, if at all.

By entering into a strategic collaboration with a partner, we may rely on the partner for financial resources and for development, regulatory and commercialization expertise. Even if we are successful in entering into a

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strategic collaboration for one of our product candidates, our partner may fail to develop or effectively commercialize the product candidate because such partner:

does not have sufficient resources or decides not to devote the necessary resources due to internal constraints such as limited cash or human resources;

decides to pursue a competitive potential product developed outside of the collaboration;

cannot obtain the necessary regulatory approvals;

determines that the market opportunity is not attractive; or

cannot manufacture the necessary materials in sufficient quantities from multiple sources or at a reasonable cost.

We also face competition in our search for partners from other biotechnology and pharmaceutical companies worldwide, many of whom are larger and able to offer more attractive deals in terms of financial commitments, contribution of human resources, or development, manufacturing, regulatory or commercial expertise and support.

If we are not successful in attracting partners and entering into collaborations on acceptable terms for these product candidates or otherwise monetizing these product candidates, we may not be able to complete development of or obtain regulatory approval for such product candidates. In such event, our ability to generate revenues from such products and achieve or sustain profitability would be significantly hindered.

***The terms under which we raise additional capital or debt financing may harm our business and may significantly dilute stockholders ownership interests.***

If we raise additional funds through collaborations or licensing arrangements with third parties, we may need to relinquish some rights to our product candidates, including commercialization rights, which may hinder our ability to generate revenues and achieve or sustain profitability. If we raise additional funds by issuing equity securities, including as part of a debt financing, stockholders may experience substantial dilution. Debt financing, if available, may involve significant cash payment obligations and restrictive covenants and other financial terms that may impede our ability to operate our business. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders.

***Our loan and security agreement with Oxford requires principal repayment on March 31, 2011 if we do not achieve certain affirmative covenants, and the agreement requires us to pledge substantial assets and also contains various covenants that may restrict our business and financing activities.***

On May 10, 2010, we entered into the Loan Agreement with Oxford governing the terms of our \$15 million senior secured credit facility. We were required to pay interest on borrowings on a monthly basis through and including February 1, 2011. Beginning March 1, 2011 through maturity of the loan, we are required to make payments of outstanding principal and interest in 30 equal monthly installments. The Loan Agreement also requires that on or before March 31, 2011 we must have either (i) entered into a collaboration, joint venture or partnership with a non-affiliate providing for up-front cash proceeds to us (with such proceeds received on or before March 31, 2011) of not less than \$15 million from either or a combination of an upfront payment(s) or proceeds from the sale or conversion of our securities issued in connection therewith or (ii) received positive Phase IIb data on MN-221, as defined in a completed partnership or joint venture agreement relating to MN-221, or had a positive end-of-Phase II meeting with the FDA and obtained the approval of the board of directors to proceed to Phase III with MN-221. We do not anticipate achieving either of these affirmative covenants by March 31, 2011 and Oxford has agreed to waive early payment penalties of approximately \$437,000 if we repay the loan in full on March 31, 2011.

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The Loan Agreement is secured by a first priority security interest in substantially all of our assets, other than intellectual property. If we fail to repay the loan when it matures, the lender could initiate foreclosure proceedings against our pledged assets. Any foreclosure proceedings would have a material adverse effect on our business, financial condition and results of operations.

*We are subject to stringent regulation of our product candidates, which could delay the development and commercialization of our product candidates.*

We, our third-party manufacturers, service providers, suppliers and partners, and our product candidates are subject to stringent regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. None of our product candidates can be marketed in the United States until it has been approved by the FDA. None of our product candidates has been approved by the FDA to date, and we may never receive FDA approval for any of our product candidates. Obtaining FDA approval for a product takes many years of clinical development and requires substantial resources. Additionally, changes in regulatory requirements and guidance may occur or new information regarding the product candidate or the target indication may emerge, and we may need to perform additional, unanticipated non-clinical or clinical testing of our product candidates or amend clinical trial protocols to reflect these changes. Any additional unanticipated testing would add costs and could delay or result in the denial of regulatory approval for a product candidate. These regulatory requirements may limit the size of the market for the product or result in the incurrence of additional costs. Any delay or failure in obtaining required approvals could substantially reduce or negate our ability to generate revenues from the particular product candidate.

In addition, both before and after regulatory approval, we, our partners and our product candidates are subject to numerous FDA requirements, including requirements related to testing, manufacturing, quality control, labeling, advertising, promotion, distribution and export. The FDA's requirements may change and additional government regulations may be promulgated that could affect us, our partners and our product candidates. Given the number of recent high profile adverse safety events with certain drug products, the FDA may require, as a condition of approval, costly risk management programs, which may include safety surveillance, restricted distribution and use, patient education, enhanced labeling, special packaging or labeling, expedited reporting of certain adverse events, preapproval of promotional materials and restrictions on direct-to-consumer advertising. Furthermore, we cannot predict the likelihood, nature or extent of government regulation that may arise from this or future legislation or administrative action, either in the United States or abroad.

In order to market any of our products outside of the United States, we and our strategic partners and licensees must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods beyond the requirements of the FDA and the time required to obtain approval in other countries might differ from that required to obtain FDA approval. The regulatory approval process in other countries may include all of the risks detailed above regarding FDA approval in the United States. Regulatory approval in one country, including FDA approval in the United States, does not ensure regulatory approval in another. In addition, a failure or delay in obtaining regulatory approval in one country may negatively impact the regulatory process in others. A product candidate may not be approved for all indications that we request, which would limit the uses of our product and adversely impact our potential royalties and product sales, and any approval that we receive may be subject to limitations on the indicated uses for which the product may be marketed or require costly, post-marketing follow-up studies.

If we fail to comply with applicable regulatory requirements in the United States or other countries, we may be subject to regulatory and other consequences, including fines and other civil penalties, delays in approving or failure to approve a product, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions, interruption of manufacturing or clinical trials, injunctions and criminal prosecution, any of which would harm our business.

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***We rely on third parties to conduct our clinical trials, and we may incur additional development costs, experience delays in the commencement and completion of clinical trials, and be unable to obtain regulatory approval for or commercialize our product candidates on our anticipated timeline if these third parties do not successfully carry out their contractual duties or meet expected deadlines.***

We rely extensively on CROs, medical institutions, clinical investigators, contract laboratories and other service providers to perform important functions related to the conduct of our clinical trials, the collection and analysis of data and the preparation of regulatory submissions. Although we design and manage our current clinical trials to ensure that each clinical trial is conducted in accordance with its investigational plan and protocol, we do not have the ability to conduct all aspects of our clinical trials directly for our product candidates.

The FDA requires us and our CROs to comply with regulations and standards, commonly referred to as good clinical practices, or GCPs, for conducting, monitoring, recording and reporting the results of clinical trials to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical trials. Our reliance on CROs does not relieve us of these responsibilities and requirements. The CROs, medical institutions, clinical investigators, contract laboratories and other service providers that we employ in the conduct of our clinical trials are not our employees, and we cannot control the amount or timing of resources that they devote to our product development programs. If any of these third parties fails to devote sufficient care, time and resources to our product development programs, if its performance is substandard, or if any third party is inspected by the FDA and found not to be in compliance with GCPs, it will delay the completion of the clinical trial in which they are involved and the progress of the affected development program. The CROs with which we contract for execution of our clinical trials play a significant role in the conduct of the clinical trials and the subsequent collection and analysis of data. Any failure of the CROs to meet their obligations could adversely affect clinical development of our product candidates. Moreover, the CROs, clinical investigators and other service providers may have relationships with other commercial entities, some of which may have competitive products under development or currently marketed, and our competitive position could be harmed if they assist our competitors. If any of these third parties does not successfully carry out their contractual duties or obligations or meet expected deadlines, or if the quality or accuracy of the clinical data is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for our product candidates. In addition, while we believe that there are numerous alternative sources to provide these services, we might not be able to enter into replacement arrangements without delays or additional expenditures if we were to seek such alternative sources.

***We rely on third-party manufacturers to produce our product candidates, which may result in delays in our clinical trials and the commercialization of products, as well as increased costs.***

We have no manufacturing facilities, and we do not intend to develop facilities for the manufacture of our product candidates for clinical trials or commercial purposes in the foreseeable future. We contract with third-party manufacturers to produce, in collaboration with us, sufficient quantities of our product candidates for clinical trials, and we plan to contract with third-party manufacturers to produce sufficient quantities of any product candidates approved by the FDA or other regulatory authorities for commercial sale. While we believe that there are competitive sources available to manufacture our product candidates, we may not be able to enter into arrangements without delays or additional expenditures. We cannot estimate these delays or costs with certainty.

Reliance on third-party manufacturers limits our ability to control certain aspects of the manufacturing process and therefore exposes us to a variety of significant risks, including risks related to our ability to commercialize any products approved by regulatory authorities or conduct clinical trials, reliance on such third parties for regulatory compliance and quality assurance, and the refusal or inability of a third-party manufacturer to supply our requirements on a long-term basis. In addition, manufacturers of pharmaceutical products often encounter difficulties in production, particularly in scaling up initial production. These problems include

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difficulties with production costs and yields, quality control, including stability of the product candidate and quality assurance testing, shortages of qualified personnel and compliance with federal, state and foreign regulations. Also, our manufacturers may not perform as agreed. If our manufacturers were to encounter any of these difficulties, our ability to timely produce our product candidates for clinical trials and commercial sale may be interrupted, which could result in delayed clinical trials or receipt of regulatory approval and lost or delayed revenues.

To date, we have entered into an agreement with Hospira Worldwide, Inc. for the development and supply of finished product of MN-221 for the treatment of acute exacerbations of asthma utilizing Hospira's proprietary ADD-Vantage drug delivery system that we intend to use in clinical trials and the commercial market if MN-221 receives regulatory approval. In addition to Hospira's proprietary drug delivery system, we anticipate entering into a commercial supply agreement for finished product of MN-221 in standard vials. However, other than Hospira, we do not have agreements established regarding commercial supply of finished product of MN-221 in standard vials or for the active pharmaceutical ingredient, or API, or finished product for any of our product candidates. In particular, pursuant to our license agreement with Kissei Pharmaceutical Co. Ltd., Kissei Pharmaceutical has the exclusive right to manufacture the commercial supply of the API for MN-221. Therefore, we will need to successfully negotiate a commercial supply agreement with Kissei Pharmaceutical on commercially reasonable terms, or another third-party manufacturer in the event that we are unable to reach agreement with Kissei Pharmaceutical, in order to manufacture the API for MN-221 on a commercial scale if MN-221 is approved by the FDA or other regulatory authorities for commercial sale. We will also need to successfully negotiate a supply agreement with a third-party manufacturer on commercially reasonable terms in order to manufacture the finished product of MN-221 in standard vials. We may not be able to establish or maintain any commercial manufacturing and supply arrangements on commercially reasonable terms that we require for purposes of commercializing a product. Any failure by us to secure or maintain any such required commercial supply agreements could result in interruption of supply and lost or delayed revenues, which would adversely affect our business.

Any problems or delays we experience in preparing for commercial-scale manufacturing of a product candidate may result in a delay in FDA or other regulatory approval of the product candidate or may impair our ability to manufacture commercial quantities, which would adversely affect our business. For example, our manufacturers will need to produce specific batches of a product candidate to demonstrate acceptable stability under various conditions and for commercially viable lengths of time. We and our third-party manufacturers will need to demonstrate to the FDA and other regulatory authorities this acceptable stability data for the product candidate, as well as validate methods and manufacturing processes, in order to receive regulatory approval to commercialize such product candidate.

Our manufacturers are obligated to operate in accordance with FDA-mandated current good manufacturing practices, or cGMPs and, in some cases, International Convention on Harmonization, or ICH, standards. A failure of any of our third-party manufacturers to establish and follow cGMPs and/or ICH standards and to document their adherence to such practices may lead to significant delays in our ability to timely conduct and complete clinical trials, obtain regulatory approval of product candidates or launch of our products into the market. In addition, changing third-party manufacturers is difficult. For example, a change in third-party manufacturer for a particular product candidate requires re-validation of the manufacturing processes and procedures in accordance with cGMPs, which may be costly and time-consuming and, in some cases, our manufacturers may not provide us with adequate assistance to transfer the manufacturing processes and procedures for our product candidates to new manufacturers or may possess intellectual property rights covering parts of these processes or procedures for which we may need to obtain a license. Failure by our third-party manufacturers or us to comply with applicable regulations could result in sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspension or withdrawal of regulatory approvals, seizures or recalls of products, operating restrictions and criminal prosecutions.

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***We may not be able to manufacture our product candidates in commercial quantities, which would prevent us from commercializing our product candidates.***

To date, our product candidates have been manufactured in small quantities for preclinical studies and clinical trials. If any of our product candidates is approved by the FDA or comparable regulatory authorities in other countries for commercial sale, we will need to manufacture such product candidate in larger quantities. We may not be able to increase successfully the manufacturing capacity for any of our product candidates in a timely or economic manner, or at all. Significant scale-up of manufacturing may require additional validation studies, which the FDA must review and approve. If we are unable to increase successfully the manufacturing capacity for a product candidate, the regulatory approval or commercial launch of that product candidate may be delayed or there may be a shortage in supply. Our product candidates require precise, high quality manufacturing. Our failure to achieve and maintain these high manufacturing standards in collaboration with our third-party manufacturers, including the incidence of manufacturing errors, could result in patient injury or death, product recalls or withdrawals, delays or failures in product testing or delivery, cost overruns or other problems that could harm our business, financial condition and results of operations.

***Materials necessary to manufacture our product candidates may not be available on commercially reasonable terms, or at all, which may delay the development and commercialization of our product candidates.***

We rely on the third-party manufacturers of our product candidates to purchase from third-party suppliers the materials necessary to produce the API and product candidates for our clinical trials, and we will rely on such manufacturers to purchase such materials to produce the API and finished product for any commercial distribution of our products if we obtain marketing approval. Suppliers may not sell these materials to our manufacturers at the time they need them in order to meet our required delivery schedule or on commercially reasonable terms, if at all. We do not have any control over the process or timing of the acquisition of these materials by our manufacturers. Moreover, we currently do not have any agreements for the production of these materials. If our manufacturers are unable to obtain these materials for our clinical trials, testing of the affected product candidate would be delayed, which may significantly impact our ability to develop the product candidate. If we or our manufacturers are unable to purchase these materials after regulatory approval has been obtained for one of our products, the commercial launch of such product would be delayed or there would be a shortage in supply of such product, which would harm our ability to generate revenues from such product and achieve or sustain profitability.

***Even if our product candidates receive regulatory approval, they may still face future development and regulatory difficulties.***

Even if U.S. regulatory approval is obtained, the FDA may still impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly post-approval studies, including additional research and development and clinical trials. Any of these restrictions or requirements could adversely affect our potential product revenues. For example, the label ultimately approved for MN-221 or MN-166/AV411, our other product candidates or any other product candidates that we may in-license or acquire, if any, may include a restriction on the terms of its use, or it may not include one or more of our intended indications.

Our product candidates will also be subject to ongoing FDA requirements for the labeling, packaging, storage, advertising, promotion, record-keeping and submission of safety and other post-market information on the drug. In addition, approved products, manufacturers and manufacturers' facilities are subject to continual review and periodic inspections. If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If our product candidates fail to comply with applicable regulatory requirements, such as commercial good manufacturing practices, or cGMPs, a regulatory agency may:

issue warning letters or untitled letters;

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require us to enter into a consent decree, which can include imposition of various fines, reimbursements for inspection costs, required due dates for specific actions and penalties for noncompliance;

impose other civil or criminal penalties;

suspend regulatory approval;

suspend any ongoing clinical trials;

refuse to approve pending applications or supplements to approved applications filed by us;

impose restrictions on operations, including costly new manufacturing requirements; or

seize or detain products or require a product recall.

***Our product candidates, if approved for sale, may not gain acceptance among physicians, patients and the medical community, thereby limiting our potential to generate revenues.***

If one of our product candidates is approved for commercial sale by the FDA or other regulatory authorities, the degree of market acceptance of any approved product by physicians, healthcare professionals and third-party payors and our profitability and growth will depend on a number of factors, including:

demonstration of efficacy;

changes in the standard of care for the targeted indication;

relative convenience and ease of administration;

the prevalence and severity of any adverse side effects;

availability, cost and potential advantages of alternative treatments, including less expensive generic drugs;

pricing and cost effectiveness, which may be subject to regulatory control;

effectiveness of our or any of our partners' sales and marketing strategies;

the product labeling or product insert required by the FDA or regulatory authority in other countries; and



the availability of adequate third-party insurance coverage or reimbursement.

If any product candidate that we develop does not provide a treatment regimen that is as beneficial as, or is perceived as being as beneficial as, the current standard of care or otherwise does not provide patient benefit, that product candidate, if approved for commercial sale by the FDA or other regulatory authorities, likely will not achieve market acceptance. Our ability to effectively promote and sell any approved products will also depend on pricing and cost-effectiveness, including our ability to produce a product at a competitive price and our ability to obtain sufficient third-party coverage or reimbursement. If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, patients and third-party payors, our ability to generate revenues from that product would be substantially reduced. In addition, our efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may never be successful.

***If our products are not accepted by the market or if users of our products are unable to obtain adequate coverage of and reimbursement for our products from government and other third-party payors, our revenues and profitability will suffer.***

Our ability to commercialize our products successfully will depend in significant part on pricing and cost effectiveness, including our ability to produce a product at a competitive price and our ability to obtain appropriate coverage of and reimbursement for our products and related treatments from governmental authorities, private health insurers and other organizations, such as health maintenance organizations, or HMOs.

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Third-party payors are increasingly challenging the prices charged for medical products and services. We cannot provide any assurances that third-party payors will consider our products cost-effective or provide coverage of and reimbursement for our products, in whole or in part.

Uncertainty exists as to the coverage and reimbursement status of newly approved medical products and services and newly approved indications for existing products. Third-party payors may conclude that our products are less safe, less clinically effective or less cost-effective than existing products, and third-party payors may not approve our products for coverage and reimbursement. If we are unable to obtain adequate coverage of and reimbursement for our products from third-party payors, physicians may limit how much or under what circumstances they will prescribe or administer them. Such reduction or limitation in the use of our products could cause our sales to suffer. Even if third-party payors make reimbursement available, payment levels may not be sufficient to make the sale of our products profitable.

Also, continuing health care reform in the U.S. will control or significantly influence the purchase of medical services and products, and may result in inadequate coverage of and reimbursement for our products. Many third-party payors are pursuing various ways to reduce pharmaceutical costs, including the use of formularies. The market for our products depends on access to such formularies, which are lists of medications for which third-party payors provide reimbursement. These formularies are increasingly restricted, and pharmaceutical companies face significant competition in their efforts to place their products on formularies. This increased competition has led to a downward pricing pressure in the industry. The cost containment measures that third-party payors, including government payors, are instituting could have a material adverse effect on our ability to operate profitably.

***If we fail to identify and license or acquire other product candidates, we will not be able to expand our business over the long term.***

Because we do not have internal discovery capabilities, our business over the long term is substantially dependent on our ability to license or acquire product candidates and further develop them for commercialization. The success of this strategy depends upon our ability to identify, select and acquire the right product candidates. We have limited experience identifying, negotiating and implementing economically viable product candidate acquisitions or licenses, which is a lengthy and complex process. Also, the market for licensing and acquiring product candidates is intensely competitive, and many of our competitors have greater resources than we do. We may not have the requisite capital resources to consummate product candidate acquisitions or licenses that we identify to fulfill our strategy.

Moreover, product candidate acquisitions that we do complete involve numerous risks, including:

difficulties in integrating the development program for the acquired product candidate into our existing operations;

diversion of financial and management resources from existing operations;

risks of entering new markets or technologies and of receiving regulatory approval;

inability to generate sufficient revenues to offset acquisition costs; and

delays that may result from our having to perform unanticipated preclinical trials or other tests on the product candidate.

If we are not successful in identifying and licensing or acquiring other product candidates over the long term, we will not be able to grow our revenues with sales from new products beyond those revenues, if any, from any approved products derived from our existing product candidates, and we may fail to achieve or sustain profitability.

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***We are dependent on our management team, Yuichi Iwaki, M.D., Ph.D., and experienced scientific staff, and if we are unable to retain, motivate and attract key personnel, our product development programs may be delayed and we may be unable to develop successfully or commercialize our product candidates.***

We are dependent upon the continued services of our executive officers and other key personnel, particularly Yuichi Iwaki, M.D., Ph.D., a founder of the company and our President and Chief Executive Officer, who has been instrumental in our ability to in-license product candidates from Japanese pharmaceutical companies and secure financing from Japanese institutions. The relationships that certain of our key managers have cultivated with pharmaceutical companies from whom we license product candidates and to whom we expect to out-license product candidates make us particularly dependent upon their continued services with us, whether through employment, service on our board of directors or a consulting agreement. We are also substantially dependent on the continued services of clinical development personnel because of the highly technical nature of our product development programs. We are not presently aware of any plans of our executive officers or key personnel to retire or leave employment with the company. Each of our executive officers is party to an employment agreement that continues in effect until the earliest of termination of employment upon (i) consent of the parties, (ii) cause or other material breach of the agreement, (iii) death or permanent disability and (iv) three months' written notice. Following termination of employment, these individuals may engage in other businesses that may compete with us.

If we acquire or license new product candidates, our success will depend on our ability to attract, retain and motivate highly qualified management and scientific personnel to manage the development of these new product candidates. In particular, our product development programs depend on our ability to attract and retain highly experienced clinical development and regulatory personnel. However, we face competition for experienced scientists and other technical and professional personnel from numerous companies and academic and other research institutions. Competition for qualified personnel is particularly intense in the San Diego, California area, where our corporate headquarters is located. Our short operating history and the uncertainties attendant to being a development-stage biopharmaceutical company could impair our ability to attract and retain personnel and impede the achievement of our development and commercialization objectives. In addition, we have scientific and clinical advisors who assist us in our product development and clinical strategies. These third parties are not our employees and may have commitments to, or contracts with, other entities that may limit their availability to us, or may have arrangements with other companies to assist in the development of products that may compete with our product candidates.

Although we have employment agreements with key members of management, each of our employees, subject to applicable notice requirements, may terminate his or her employment at any time. We do not carry key person insurance covering members of senior management. If we lose any of our key management personnel, we may not be able to find suitable replacements, which would adversely affect our business.

***If we are unable to establish our sales and distribution capabilities, we will be unable to successfully commercialize our product candidates.***

To date, we have not sold, marketed or distributed any pharmaceutical products. If we are successful in obtaining regulatory approvals for any of our product candidates or acquiring other approved products, we will need to establish sales, marketing and distribution capabilities on our own or with partners in order to commercialize an approved product. The acquisition or development of an effective sales and marketing infrastructure will require a significant amount of our financial resources and time and could negatively impact our commercialization efforts, including delay of a product launch. We may be unable to establish and manage a sufficient or effective sales force in a timely or cost-effective manner, if at all, and any sales force we do establish may not be capable of generating demand for our products, therefore hindering our ability to generate revenues and achieve or sustain profitability. In addition, if we are unable to develop internal sales capabilities, we will need to contract with third parties or establish a partnership to market and sell the product. If we are unable to establish adequate sales and marketing capabilities, whether independently or with third parties, we may not be able to generate any product revenues, may generate increased expenses and may never become

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profitable. In addition, although we intend to establish strategic collaborations to market any products approved for sale by regulatory authorities outside of the United States, we may be required to market our product candidates outside of the United States directly if we are unable to establish such collaborations. In that event, we may need to build a corresponding international sales and marketing capability with technical expertise and with supporting distribution capabilities.

### ***Health care reform measures could adversely affect our business.***

The business and financial condition of pharmaceutical and biotechnology companies are affected by the efforts of governmental and third-party payers to contain or reduce the costs of health care. In the United States and in foreign jurisdictions, there have been, and we expect that there will continue to be, a number of legislative and regulatory proposals aimed at changing the health care system. For example, in some countries, pricing of prescription drugs is subject to government control, and we expect proposals to implement similar controls in the United States to continue. Another example of proposed reform that could affect our business is drug reimportation into the United States. Moreover, the pendency or approval of such proposals could result in a decrease in our stock price or our ability to raise capital or to obtain strategic partnerships or licenses. More recently, the President signed into law the Patient Protection and Affordable Care Act, which imposes numerous provisions over a four-year period. We have begun to assess the impact of this Act, but, at this early stage the likely impact cannot be ascertained with any degree of certainty.

### ***We may be sued for product liability, which could result in substantial liabilities that exceed our available resources and damage our reputation.***

The development and commercialization of drug products entails significant product liability risks. Product liability claims may arise from use of any of our product candidates in clinical trials and the commercial sale of any approved products. If we cannot successfully defend ourselves against these claims, we will incur substantial liabilities. Regardless of merit or eventual outcome, product liability claims may result in:

withdrawal of clinical trial participants;

termination of clinical trial sites or entire clinical trial programs;

decreased demand for our product candidates;

impairment of our business reputation;

costs of related litigation;

substantial monetary awards to patients or other claimants;

loss of revenues; and

the inability to commercialize our product candidates.

We currently have insurance that covers our clinical trials. We believe our current insurance coverage is reasonably adequate at this time; however, our insurance coverage may not reimburse us or may not be sufficient to reimburse us for all expenses or losses we may suffer. In addition, we will need to increase and expand this coverage as we commence additional clinical trials, as well as larger scale clinical trials, and in the event that any of our product candidates is approved for commercial sale. This insurance may be prohibitively expensive or may not fully cover our potential liabilities. In addition, our inability to obtain sufficient insurance coverage at an acceptable cost or otherwise to protect against potential product liability claims could prevent or inhibit the regulatory approval or commercialization of products that we or one of our

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collaborators develop. Successful product liability claims could have a material adverse effect on our business and results of operations. Liability from such claims could exceed our total assets if we do not prevail in any lawsuit brought by a third party alleging that an injury was caused by one of our product candidates.

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*We may need to increase the size of our organization, and we may encounter difficulties managing our growth, which could adversely affect our results of operations.*

As of March 22, 2011, we had 18 full-time employees, following a reduction in force which took place in January 2011, wherein we down-sized the company to save costs. If we are successful in securing a strategic collaboration or raising additional capital, our management, personnel, systems and facilities currently in place may not be adequate to support the company's needs. For example, we may hire additional personnel in clinical development, regulatory affairs and business development to further strengthen our core competencies or choose to develop sales, marketing and distribution capabilities for certain of our product candidates. Our need to effectively manage our operations, growth and product development programs requires that we:

manage our clinical trials effectively;

manage our internal development efforts effectively while carrying out our contractual obligations to licensors and other third parties;

ensure that our consultants, CROs and other service providers successfully carry out their contractual obligations, provide high quality results and meet expected deadlines; and

continue to improve our operational, financial and management controls, reporting systems and procedures.

We may be unable to successfully implement these tasks on a larger scale, which may impact our ability to timely achieve our development and commercialization goals, if at all.

*We expect that our results of operations will fluctuate, which may make it difficult to predict our future performance from period to period.*

Our quarterly operating results have fluctuated in the past and are likely to continue to do so in the future. Some of the factors that could cause our operating results to fluctuate from period to period include:

the status of development of our product candidates and, in particular, the advancement or termination of activities related to our product development programs and the timing of any milestone payments payable under our licensing agreements;

the execution of other collaboration, licensing and similar arrangements and the timing of payments we may make or receive under these arrangements;

variations in the level of expenses related to our product development programs;

the unpredictable effects of collaborations during these periods;

the timing of our satisfaction of applicable regulatory requirements, if at all;

the rate of expansion of our clinical development and other internal research and development efforts;

the costs of any litigation;

the effect of competing technologies and products and market developments; and

general and industry-specific economic conditions.

We believe that quarterly or yearly comparisons of our financial results are not necessarily meaningful and should not be relied upon as indications of our future performance.

***Our management has broad discretion over the use of our cash, and we may not use our cash effectively, which could adversely affect our results of operations.***

Our management has significant flexibility in applying our cash resources and could use these resources for corporate purposes that do not increase our market value or in ways with which our stockholders may not agree. We may use our cash resources for corporate purposes that do not yield a significant return or any return at all for our stockholders, which may cause our stock price to decline.

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*We will continue to incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.*

As a public company, we are required to comply with the Sarbanes-Oxley Act of 2002, as well as rules and regulations implemented by the SEC, The Nasdaq Stock Market, or Nasdaq, and Japanese securities laws, and incur significant legal, accounting and other expenses as a result. These rules impose various requirements on public companies, including requiring the establishment and maintenance of effective disclosure and financial controls and appropriate corporate governance practices. Our management and other personnel have devoted and will continue to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations increase our legal and financial compliance costs and may make it more difficult and expensive for us to renew our director and officer liability insurance, and result in imposition of reduced policy limits and coverage.

The Sarbanes-Oxley Act requires that we maintain effective internal controls for financial reporting and disclosure controls and procedures. Our listing obligations under the Nasdaq Market (formerly the Hercules Market until its closure in 2010) of the Osaka Securities Exchange, or the OSE, also require that we comply either with Section 404 of the Sarbanes-Oxley Act or equivalent regulations in Japan and we elected to comply with Section 404. As a result, we are required to perform an evaluation of our internal control over financial reporting to allow management to report on the effectiveness of those controls, as required by Section 404. As a smaller reporting company, our report regarding internal control over financial reporting for the year ended December 31, 2010 was not subject to attestation by our registered public accounting firm pursuant to temporary SEC rules. We are not subject to attestation on our report regarding internal control over financial reporting for the year ended December 31, 2010 for SEC reporting; however, it is required under Japanese securities laws. Our efforts to comply with Section 404 and related regulations have required, and continue to require, the commitment of significant financial and managerial resources. We cannot be certain that a material weakness will not be identified when we test the effectiveness of our control systems in the future. If a material weakness is identified, we could be subject to sanctions or investigations by Nasdaq, the SEC, the OSE or other regulatory authorities, which would require additional financial and management resources, costly litigation or a loss of public confidence in our internal controls, which could have an adverse effect on the market price of our stock.

*We identified a material weakness in our internal control over financial reporting, and any failure to effectively remediate the material weakness identified as of September 30, 2010 could result in material misstatements in our financial statements.*

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting that creates a reasonable possibility that a material misstatement of our interim or annual financial statements will not be prevented or detected on a timely basis. In the course of carrying out the required quarterly evaluation and preparing the financial statements as of September 30, 2010, management identified control overrides and policy deviations by one of our senior executive officers. The following deficiencies in internal control over financial reporting, which collectively represented a material weakness in our internal control over financial reporting, were reported by management to our Audit Committee:

A senior executive officer lacked a sufficient control awareness related to compliance with our Code of Conduct, contract review and approval policies, and certain human resources policies and procedures for employee terminations.

We did not design adequate human resources policies and procedures related to ensuring compliance with our Code of Conduct. Our management team is committed to achieving and maintaining a strong control environment and an overall tone within the organization that empowers all employees to act with the highest standards of ethical conduct. In addition, management remains committed to the process of developing and implementing improved



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corporate governance and compliance initiatives. Our Board and management team implemented the following remediation plan to address the material weakness and enhance our internal controls:

The Board revised our contract review and approval policy to require the signature of two executive officers, one of whom must be the Chief Financial Officer or his designee;

The Board assigned additional responsibility to the Compensation Committee, including requirements that the Compensation Committee approve (1) any salary increases/adjustments greater than 10%, (2) any promotion or hiring into any position at the level of Vice President or above, (3) the salary of any individual promoted or hired for any position at the level of Vice President or above and (4) the granting to any employee of benefits or other perquisites not generally available to all employees;

The Board changed the reporting lines of our Vice President of Clinical Development and our Manager of Human Resources and Administration; and

Due to the appearance of a possible conflict of interest, the Board granted a waiver under our Code of Conduct to a senior executive officer and one of our other employees with respect to any joint real estate and banking transactions to which they are party as of November 13, 2010.

In addition, subsequent to September 30, 2010, our Board formed a Strategic and Operational Review Committee comprised of certain members of our Board and our senior management team that has been tasked with reviewing all key strategic and operational matters. Our Board and our senior management team may engage additional third-party specialists to further review and identify any other enhancements to our internal controls that may help prevent future significant deficiencies and/or material weaknesses.

As of March 23, 2011, we have tested our remediation plan with the assistance of a third party and we have conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2010. The framework on which such evaluation was based is contained in the report entitled *Internal Control – Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (the *COSO Report* ). Based on our evaluation under the criteria set forth in the *COSO Report*, our management concluded our internal control over financial reporting was effective as of December 31, 2010. Our auditors, however, have not completed the audit of the effectiveness of our internal control over financial reporting as of December 31, 2010 and there is no assurance that the auditors will determine that the remediation is complete or that our internal control over financial reporting is effective. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

If significant deficiencies or additional material weaknesses in our internal control are discovered or occur in the future, we may fail to meet our future reporting obligations on a timely basis, our consolidated financial statements may contain material misstatements, we could be required to restate our prior period financial results, our operating results may be harmed, we may be subject to class action litigation and our common stock could be delisted from Nasdaq and the JASDAQ Market of the OSE in Japan.

### ***Our business and operations would suffer in the event of system failures.***

Despite the implementation of security measures, our internal computer systems are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Any system failure, accident or security breach that causes interruptions in our operations could result in a material disruption of our drug development programs, including delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we may incur liability and the further development of our product candidates may be delayed.

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*We may not realize all of the anticipated benefits of the combined clinical development programs based on ibudilast.*

We may not be able to successfully secure a strategic collaboration to advance the combined ibudilast development programs. Following completion of the Phase II clinical trial of MN-166 for the treatment of MS in the second quarter of 2008 and the acquisition of AV411 in December 2009, we have not undertaken, nor do we plan to undertake, any further significant clinical development of MN-166/AV411 until such time that we secure a strategic collaboration to advance the combined clinical development of MN-166/AV411 ibudilast-based development program. We cannot assure you that we will be able to secure such a strategic collaboration or otherwise further advance, or recognize value from, a combined MN-166/AV411 clinical development program.

**Risks Related to Our Intellectual Property**

*Our ability to compete may decline if we do not adequately protect our proprietary rights.*

There is the risk that our patents (both those owned by us and those in-licensed) may not provide a competitive advantage, including the risk that our patents expire before we obtain regulatory and marketing approval for one or more of our product candidates, particularly our in-licensed patents. Also, our competitors may develop products similar to ours using methods and technologies that are beyond the scope of our intellectual property rights. Composition of matter patents on APIs may provide protection for pharmaceutical products without regard to formulation, method of use, or other type of limitation. We do not have compound patent protection for the API in our MN-166/AV411 and MN-001 product candidates, although we do have patent protection for a particular crystalline polymorph of MN-001 and we have composition of matter protection on ibudilast analogs. As a result, competitors that obtain the requisite regulatory approval will be able to offer products with the same API as found in our MN-166/AV411 and MN-001 product candidates so long as such competitors do not infringe any methods of use, methods of manufacture, formulation or, in the case of MN-001, specific polymorph patents that we hold or have exclusive rights to through our licensors. For example, we currently rely on a method of use patent for MN-166, which covers the use of the API found in our MN-166 product candidate for the treatment of MS. We also have a method of use patent for AV411 for the treatment of neuropathic pain syndromes.

It is our policy to consult with our licensors in the maintenance of granted patents we have licensed and in their pursuit of patent applications that we have licensed, but each of our licensors generally remains primarily responsible for or in control of the maintenance of the granted patents and prosecution of the applications. We have limited control, if any, over the amount or timing of resources that each licensor devotes on our behalf, and a licensor may not assign as great a priority to prosecution of these patent applications as we would if we were undertaking such prosecution ourselves. As a result of this lack of control and general uncertainties in the patent prosecution process, we cannot be sure that our licensed patents will be maintained and that any additional patents will ever mature from our licensed applications. Issued U.S. patents require the payment of maintenance fees to continue to be in force. We typically rely on our licensors to do this and their failure to do so could result in the forfeiture of patents not timely maintained. Many foreign patent offices also require the payment of periodic annuities to keep patents and patent applications in good standing. As we generally do not maintain control over the payment of annuities, we cannot be certain that our licensors will timely pay such annuities and that the granted patents and pending patent applications will not become abandoned. For example, certain annuities were not paid in a timely manner with respect to foreign patents licensed under MN-002 (the active metabolite of MN-001) and, as a result, our patent rights may be impaired in those territories. In addition, our licensors may have selected a limited amount of foreign patent protection, and therefore applications have not been filed in, and foreign patents may not have been perfected in, all commercially significant countries.

The patent protection of our product candidates and technology involves complex legal and factual questions. Most of our license agreements give us a right, but not an obligation, to enforce our patent rights. To the extent it is necessary or advantageous for any of our licensors cooperation in the enforcement of our patent rights, we cannot control the amount or timing of resources our licensors devote on our behalf or the priority they

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place on enforcing our patent rights. We may not be able to protect our intellectual property rights against third party infringement, which may be difficult to detect, especially for infringement of patent claims for methods of manufacturing. Additionally, challenges may be made to the ownership of our intellectual property rights, our ability to enforce them or our underlying licenses, which in some cases have been made under foreign laws and may provide different protections than that of U.S. law.

We cannot be certain that any of the patents or patent applications owned by us or our licensors related to our product candidates and technology will provide adequate protection from competing products. Our success will depend, in part, on whether we or our licensors can:

obtain and maintain patents to protect our product candidates;

obtain and maintain any required or desirable licenses to use certain technologies of third parties, which may be protected by patents;

protect our trade secrets and know-how;

operate without infringing the intellectual property and proprietary rights of others;

enforce the issued patents under which we hold rights; and

develop additional proprietary technologies that are patentable.

The degree of future protection for our proprietary rights is uncertain. For example:

we or our licensor might not have been the first to make the inventions covered by each of our pending patent applications or issued patents;

we or our licensor might not have been the first to file patent applications for these inventions;

others may independently develop similar or alternative technologies or duplicate any of our technologies;

it is possible that none of our pending patent applications will result in issued patents;

any patents under which we hold rights may not provide us with a basis for maintaining market exclusivity for commercially viable products, may not provide us with any competitive advantages or may be challenged by third parties as invalid, not infringed or unenforceable under U.S. or foreign laws; or

any of the issued patents under which we hold rights may not be valid or enforceable or may be circumvented successfully in light of the continuing evolution of domestic and foreign patent laws.

*Confidentiality agreements with employees and others may not adequately prevent disclosure of our trade secrets and other proprietary information and may not adequately protect our intellectual property, which could limit our ability to compete.*

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Because we operate in the highly technical field of research and development of small molecule drugs, we rely in part on trade secret protection in order to protect our proprietary trade secrets and unpatented know-how. However, trade secrets are difficult to protect, and we cannot be certain that others will not develop the same or similar technologies on their own. We have taken steps, including entering into confidentiality agreements with our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors, to protect our trade secrets and unpatented know-how. These agreements generally require that the other party keep confidential and not disclose to third parties all confidential information developed by the party or made known to the party by us during the course of the party's relationship with us. We also typically obtain agreements from these parties which provide that inventions conceived by the party in the course of rendering services to us will be our exclusive property. However, these agreements may not be honored and may not effectively assign intellectual property rights to us. Further, we have limited control, if any, over the protection of trade secrets

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developed by our licensors. Enforcing a claim that a party illegally obtained and is using our trade secrets or know-how is difficult, expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States may be less willing to protect trade secrets or know-how. The failure to obtain or maintain trade secret protection could adversely affect our competitive position.

*A dispute concerning the infringement or misappropriation of our proprietary rights or the proprietary rights of others could be time consuming and costly, and an unfavorable outcome could harm our business.*

There is significant litigation in our industry regarding patent and other intellectual property rights. While we are not currently subject to any pending intellectual property litigation, and are not aware of any such threatened litigation, we may be exposed to future litigation by third parties based on claims that our product candidates, their methods of use, manufacturing or other technologies or activities infringe the intellectual property rights of such third parties. There are many patents relating to chemical compounds and methods of use. If our compounds or their methods of use or manufacture are found to infringe any such patents, we may have to pay significant damages or seek licenses under such patents. We have not conducted comprehensive searches for unexpired patents issued to third parties relating to our product candidates. Consequently, no assurance can be given that unexpired, third-party patents containing claims covering our product candidates, their methods of use or manufacture do not exist. Moreover, because some patent applications in the United States may be maintained in secrecy until the patents are issued, and because patent applications in the United States and many foreign jurisdictions are typically not published until 18 months after filing, we cannot be certain that others have not filed patent applications that will mature into issued patents that relate to our current or future product candidates and which could have a material effect in developing and commercializing one or more of our product candidates. The owner of a patent that is arguably infringed can bring a civil action seeking to enjoin an accused infringer from importing, making, marketing, distributing, using or selling an infringing product. We may need to resort to litigation to enforce our intellectual property rights or to seek a declaratory judgment concerning the scope, validity or enforceability of third-party proprietary rights. Similarly, we may be subject to claims that we have inappropriately used or disclosed trade secrets or other proprietary information of third parties. If we become involved in litigation, it could consume a substantial portion of our managerial and financial resources, regardless of whether we win or lose. Some of our competitors may be able to sustain the costs of complex intellectual property litigation more effectively than we can because they have substantially greater resources. We may not be able to afford the costs of litigation. Any legal action against us or our collaborators could lead to:

payment of actual damages, royalties, lost profits, potential enhanced damages and attorneys' fees, if any infringement for which we are found liable is deemed willful, or a case against us is determined by a judge to be exceptional;

injunctive or other equitable relief that may effectively block our ability to further develop, commercialize and sell our products;

having to enter into license arrangements that may not be available on reasonable or commercially acceptable terms; or

significant cost and expense, as well as distraction of our management from our business.

As a result, we could lose our ability to develop and commercialize current or future product candidates.

*We may be subject to claims that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.*

As is common in the biotechnology and pharmaceutical industry, we employ individuals who were previously employed at other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although no claims against us are currently pending, we may be subject to claims that these

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employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

### **Risks Related to the Securities Markets and Investment in Our Common Stock and Warrants**

*Our stock price may be volatile, and you may not be able to resell our shares at a profit or at all.*

Despite the listing of our common stock on the Nasdaq Global Market and the Jasdaq Market of the OSE in Japan, trading volume in our securities has been light and an active trading market may not develop for our common stock. In February 2011, our average trading volume was approximately 10,600 shares per day on the Nasdaq Global Market and approximately 24,800 shares per day on the Jasdaq Market.

The market prices for securities of biopharmaceutical and biotechnology companies, and early-stage drug discovery and development companies like us in particular, have historically been highly volatile and may continue to be highly volatile in the future. For example, since the date of our initial public offering in Japan on February 4, 2005 through February 28, 2011, our common stock has traded as high as approximately \$42.00 and as low as approximately \$1.40. The following factors, in addition to other risk factors described in this section, may have a significant impact on the market price of our common stock:

the development status of our product candidates, including clinical trial results and determinations by regulatory authorities with respect to our product candidates, and particularly our prioritized product candidates;

the initiation, termination, or reduction in the scope of any collaboration arrangements or any disputes or developments regarding such collaborations;

FDA or foreign regulatory actions, including failure to receive regulatory approval for any of our product candidates;

announcements of technological innovations, new commercial products or other material events by us or our competitors;

disputes or other developments concerning our intellectual property rights;

market conditions in the pharmaceutical and biotechnology sectors;

actual and anticipated fluctuations in our quarterly or annual operating results;

price and volume fluctuations in the overall stock markets;

any potential delisting of our securities;

changes in, or failure to meet, securities analysts' or investors' expectations of our financial performance;

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additions or departures of key personnel;

discussions of our business, management, products, financial performance, prospects or stock price by the financial and scientific press and online investor communities;

litigation or public concern about the safety of our potential products;

public concern as to, and legislative action with respect to, the pricing and availability of prescription drugs or the safety of drugs and drug delivery techniques; or

regulatory developments in the United States and in foreign countries.

Broad market and industry factors, as well as economic and political factors, also may materially adversely affect the market price of our common stock.

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***We may become involved in securities class action litigation that could divert management's attention and harm our business.***

The stock markets have from time to time experienced significant price and volume fluctuations that have affected the market prices for the common stock of biotechnology and biopharmaceutical companies. These broad market fluctuations may cause the market price of our common stock to decline. In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biotechnology and biopharmaceutical companies have experienced significant stock price volatility in recent years. We may become involved in this type of litigation in the future. Litigation often is expensive and diverts management's attention and resources, which could adversely affect our business.

***Future sales of our common stock may cause our stock price to decline and may make it difficult to sell your shares.***

Sales of substantial amounts of our common stock, or the availability of such common stock for sale, could adversely affect the prevailing market prices for our common stock. If this occurs and continues, it could impair our ability to raise additional capital through the sale of securities should we desire to do so. In addition, it may be difficult, or even impossible, to find a buyer for shares of our common stock.

We have also registered all common stock that we may issue under our current employee benefits plans and upon exercise of the warrants included in the units being sold in this offering. As a result, these shares can be freely sold in the public market upon issuance, subject to the terms of the underlying agreements governing the grants and the restrictions of the securities laws. In addition, our directors and officers may in the future establish programmed selling plans under Rule 10b5-1 of the Exchange Act, for the purpose of effecting sales of our common stock. If any of these events cause a large number of our shares to be sold in the public market, the sales could reduce the trading price of our common stock and impede our ability to raise future capital.

***Anti-takeover provisions in our charter documents and under Delaware law and the existence of our stockholder rights plan may make an acquisition of us more complicated and the removal and replacement of our directors and management more difficult.***

Our restated certificate of incorporation and amended and restated bylaws contain provisions that may delay or prevent a change in control, discourage bids at a premium over the market price of our common stock or adversely affect the market price of our common stock and the voting and other rights of the holders of our common stock. These provisions may also make it difficult for stockholders to remove and replace our board of directors and management. These provisions:

establish that members of the board of directors may be removed only for cause upon the affirmative vote of stockholders owning at least a majority of our capital stock;

authorize the issuance of blank check preferred stock that could be issued by our board of directors in a discriminatory fashion designed to increase the number of outstanding shares and prevent or delay a takeover attempt;

limit who may call a special meeting of stockholders;

establish advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted upon at stockholder meetings;

prohibit our stockholders from making certain changes to our Restated Certificate of Incorporation or Amended and Restated Bylaws except with 66 <sup>2</sup>/<sub>3</sub> percent stockholder approval; and

provide for a classified board of directors with staggered terms.





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In addition, we adopted a stockholder rights plan in November 2006, pursuant to which each share of our common stock includes an attached preferred stock purchase right, that is designed to impede takeover transactions that are not supported by our board of directors.

We also may be subject to provisions of the Delaware corporation law that, in general, prohibit any business combination with a beneficial owner of 15 percent or more of our common stock for three years unless the holder's acquisition of our stock was approved in advance by our board of directors. Although we believe these provisions collectively provide for an opportunity to receive higher bids by requiring potential acquirers to negotiate with our board of directors, they would apply even if the offer may be considered beneficial by some stockholders. In any event, these provisions may delay or prevent a third party from acquiring us. Any such delay or prevention could cause the market price of our common stock to decline.

***We have never paid dividends on our capital stock, and we do not anticipate paying any cash dividends in the foreseeable future.***

We have paid no cash dividends on any of our classes of capital stock to date, and we currently intend to retain our future earnings, if any, to fund the development and growth of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

### **Risks Related to This Offering**

***There is no trading market for the warrants issued in this offering and the market price of our common stock may fall below the exercise price of the warrants.***

The warrants being issued in this offering will not be listed for trading on any securities exchange and we have no intention of applying for any listing of the warrants. The warrants will expire five years from the date of issuance. The market price of our common stock may fall below the exercise price of the warrants prior to their expiration. Any warrants not exercised by their date of expiration will expire worthless and we will be under no further obligation to the holders of such warrants.

***Management will have broad discretion as to the use of the proceeds from this offering, and we may not use the proceeds effectively.***

Our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. Our failure to apply these funds effectively could have a material adverse effect on our business, delay the development of our product candidates and cause the price of our common stock to decline.

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

The portion of the public offering price per unit in this offering attributable to our common stock exceeds the net tangible book value per share of our common stock outstanding prior to this offering. Based on the public offering price of \$3.00 per unit (attributing no value to the warrants included in the units and excluding the proceeds, if any, from the exercise of the warrants issued in this offering), and after deducting the underwriting discount and estimated offering expenses payable by us, you will experience immediate dilution of \$1.51 per share, representing the difference between our as adjusted net tangible book value per share as of September 30, 2010 after giving effect to this offering and the public offering price. The exercise of outstanding stock options and warrants, as well as the warrants issued in this offering, will 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.

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**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 of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These 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;

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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.

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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.

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**USE OF PROCEEDS**

We estimate that the net proceeds from the sale of the units that we are offering, excluding the proceeds, if any, from the exercise of the warrants issued in this offering, will be approximately \$7.5 million based on the public offering price of \$3.00 per unit (attributing no value to the warrants included in the units) and after deducting the underwriting discount and estimated offering expenses payable by us.

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 \$4.5 million of such net proceeds to fund development work for MN-221 and \$500,000 of such net proceeds for other research and development on MN-166/AV411. We may also use a portion of the net proceeds from the sale of the securities under this prospectus supplement 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.

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**DILUTION**

Our net tangible book value as of September 30, 2010 was \$15,049,728 million, or \$1.21 per share of common stock. Net tangible book value per share is calculated by subtracting our total liabilities from our total tangible assets, and dividing this amount by the number of shares of common stock outstanding.

After giving effect to our sale of 2,750,000 units in this offering at the public offering price of \$3.00 per unit (attributing no value to the warrants included in the units and excluding the proceeds, if any, from the exercise of the warrants issued in this offering) and after deducting the underwriting discount and estimated offering expenses payable by us, our as adjusted net tangible book value as of September 30, 2010 would have been approximately \$22.6 million, or \$1.49 per share. This represents an immediate increase in net tangible book value of \$0.28 per share to existing stockholders and immediate dilution in net tangible book value of \$1.51 per share to new investors participating in this offering at the public offering price. The following table illustrates this dilution on a per share basis:

Public offering price per unit		\$ 3.00
Historical net tangible book value per share as of September 30, 2010	\$ 1.21	
Increase per share attributable to investors participating in this offering	0.28	
As adjusted net tangible book value per share after this offering		1.49
Dilution per share to investors participating in this offering		\$ 1.51

If the underwriter exercises in full its option to purchase up to 412,500 additional units at the public offering price of \$3.00 per unit, the as adjusted net tangible book value after this offering would be \$1.52 per share, representing an increase in net tangible book value of \$0.31 per share to existing stockholders and immediate dilution in net tangible book value of \$1.48 per share to new investors participating in this offering at the public offering price.

The above discussion and table are based on 12,425,479 shares of our common stock outstanding as of the close of business on September 30, 2010. This number excludes, as of the close of business on September 30, 2010:

1,538,804 shares of common stock reserved for the exercise of options outstanding at a weighted average exercise price of \$9.78;

1,749,974 shares of common stock reserved for issuance under our stock incentive programs;

198,020 shares of common stock reserved for the exercise of a warrant outstanding at an exercise price of \$6.06;

259,127 shares of common stock reserved for issuance under our employee stock purchase program; and

4,172,746 shares of common stock reserved for issuance upon conversion of \$28,374,672.92 in principal of outstanding convertible notes.

Investors that purchase common stock upon the exercise of the warrants offered hereby may experience dilution depending on our net tangible book value at the time of exercise.

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**BUSINESS**

**Our Business**

We are a biopharmaceutical company focused on acquiring and developing novel, small molecule therapeutics for the treatment of diseases with unmet medical need 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, each of which we believe has a well-characterized and differentiated therapeutic profile, attractive commercial potential and patent assets having claims of commercially adequate scope. 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 was AV411, a macrophage migration inhibitory factor and a glial attenuator for central nervous system, or CNS, disorders, such as neuropathic pain, opioid withdrawal and methamphetamine addiction.

We believe that our ability to gain access to and acquire potentially high-value product candidates from Japanese and European pharmaceutical companies is largely attributable to the established relationships and broad industry experience of our management team. In particular, we believe our relationships with Japanese pharmaceutical companies and their executives provide us with a competitive advantage in opportunistically sourcing product candidates from Japanese pharmaceutical companies at attractive terms. Since our inception, we have established relationships with a number of pharmaceutical companies, including Kissei Pharmaceutical Co., Ltd., or Kissei Pharmaceutical, Kyorin Pharmaceutical Co., Ltd., or Kyorin Pharmaceutical, Mitsubishi Tanabe Pharma Corporation and Meiji Seika Kaisha, Ltd., or Meiji Seika Kaisha, in Japan and Angiogene Pharmaceuticals, Ltd., or Angiogene Pharmaceuticals, in the United Kingdom, pursuant to which we have obtained rights to develop and commercialize our current product candidates.

Since our inception, we have acquired licenses to eight compounds for the development of ten product candidates in what we believe are large and underserved markets. Our development pipeline consists of eight product development programs which have been in clinical development for the treatment of asthma, acute exacerbations of asthma, diabetic neuropathic pain, opioid addiction, multiple sclerosis, or MS, interstitial cystitis, or IC, solid tumor cancers, Generalized Anxiety Disorder/insomnia, preterm labor and urinary incontinence. Our two earlier stage product development programs have been in preclinical development for the treatment of thrombotic disorders. In addition, we have expanded the development program for one of our prioritized product candidates, MN-221, to evaluate MN-221 for the treatment of Chronic Obstructive Pulmonary Disease, or COPD, exacerbations.



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

**Product**

<b>Candidate</b>	<b>Disease/Indication</b>	<b>Phase of Development</b>	<b>Licensors</b>	<b>Licensed Territory</b>
MN-221	Acute exacerbations of asthma and COPD exacerbations	Phase II clinical trial in emergency rooms at planned escalating doses in patients with severe, acute exacerbations of asthma completed in Q2, 2009	Kissei  Pharmaceutical	Worldwide, except  Japan*
		Phase II clinical trial in emergency rooms to evaluate safety and efficacy in patients with severe, acute exacerbations of asthma initiated in Q1, 2009 and ongoing; expected to be completed in the second half of 2011		
		Phase Ib clinical trial to evaluate the safety and efficacy in patients with stable, moderate to severe COPD completed in Q1, 2010		
MN-166/ AV411**	CNS disorders***	Phase II clinical trial completed in Q2, 2008	Kyorin  Pharmaceutical (MN-166)	Worldwide, except  Japan, China, Taiwan and South Korea (MN-166)
		Prototype once-per-day oral formulation developed for future clinical trials		
		Phase Ib/IIa clinical trial in diabetic neuropathic pain completed in Q4, 2007		
		Phase Ib National Institute on Drug Abuse, or NIDA, funded clinical trial in methamphetamine-dependent volunteers initiated in Q4, 2010		
		Phase Ib/IIa NIDA-funded clinical trial to evaluate safety and efficacy in heroin-dependent volunteers completed		

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in Q4, 2010

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\* Pursuant to our license agreement with Kissei Pharmaceutical, Kissei Pharmaceutical has the right to co-promote licensed products in our territory on terms to be agreed upon by the parties. On March 3, 2011, we executed a joint venture agreement with Zhejiang Medicine Co., Ltd. and Beijing Make-Friend Medicine Technology Co., Ltd., which provides for the establishment of a joint venture company to develop and commercialize MN-221 in China.

\*\* MN-166 and AV411 are both ibudilast, an orally available, small molecule therapeutic. With the acquisition of AV411, we are integrating the two ibudilast-based product development programs and pursuing discussions with potential partners to secure a strategic collaboration to advance clinical development of the combined development programs. Our rights to MN-166 licensed from Kyorin Pharmaceutical exclude ophthalmic solution formulations.

AV411 has advanced through multiple Phase I and IIa clinical trials in healthy volunteers and patients with neuropathic pain.

\*\*\* CNS disorders encompass MS, neuropathic pain, opioid addiction and withdrawal and methamphetamine addiction.

Upon completion of proof-of-concept Phase II clinical trials, we intend to enter into strategic alliances with leading pharmaceutical or biotech companies to support further clinical development, and plan to keep certain commercialization rights in select markets. In addition, we continue to limit development activities for the balance of our existing product candidates in order to focus on our prioritized programs. For each of these remaining product candidates, we plan to conduct development activities only to the extent deemed necessary to maintain our license rights or maximize its value while pursuing a variety of initiatives to monetize such product candidate on appropriate terms. We cannot assure you that we will be successful in monetizing these product candidates on attractive terms, or at all. See *Risk Factors*.

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Our remaining eight product development programs consist of:

**Product**

<b>Candidate</b>	<b>Disease/Indication</b>	<b>Phase of Development</b>	<b>Licensors</b>	<b>Licensed Territory</b>
MN-001*	Bronchial asthma	Phase III clinical trial initiated in Q4, 2006 and terminated in Q2, 2007; Once-per-day oral dosing formulation prototypes developed	Kyorin Pharmaceutical	Worldwide, except Japan, China, Taiwan and South Korea
MN-001	Interstitial cystitis	Phase II clinical trial completed in Q1, 2007	Kyorin Pharmaceutical	Worldwide, except Japan, China, Taiwan and South Korea
MN-029	Solid tumors	Phase I clinical trial completed in Q2, 2006; Second Phase I clinical trial completed in Q4, 2007	Angiogene Pharmaceuticals	Worldwide
MN-305	Generalized Anxiety Disorder/ Insomnia	Phase II clinical trial completed in Generalized Anxiety Disorder in Q2, 2006 ; Phase II clinical trial in insomnia completed in Q4, 2007	Mitsubishi Tanabe Pharma Corporation	Worldwide, except Japan and certain other countries in Asia
MN-221	Preterm labor	Phase I clinical trial completed in Q2, 2007	Kissei Pharmaceutical	Worldwide, except Japan
MN-246	Urinary incontinence	Phase I clinical trial completed in Q4, 2006; Phase I food effects study completed in Q1, 2007	Mitsubishi Tanabe Pharma Corporation	Worldwide, except Japan and certain other countries in Asia
MN-447	Thrombotic disorders	Preclinical	Meiji Seika Kaisha	Worldwide, except Japan and certain other countries in Asia
MN-462	Thrombotic disorders	Preclinical	Meiji Seika Kaisha	Worldwide, except Japan and certain other countries in Asia

\* Our rights to MN-001 licensed from Kyorin Pharmaceutical exclude ophthalmic solution formulations. Although positive signs of efficacy were obtained in the clinical trials conducted on MN-001 in interstitial cystitis and MN-305 in Generalized Anxiety Disorder, the predefined primary statistical endpoints of the clinical trials were not achieved; therefore, we would not anticipate submitting either clinical trial as a pivotal trial supporting a New Drug Application, or NDA, to the FDA. In the Phase II clinical trial conducted on MN-305 in insomnia, the predefined statistical endpoint of the clinical trial was not achieved; therefore, we terminated any further development of MN-305 for the treatment of insomnia.

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### **Our Strategy**

Our goal is to build a sustainable biopharmaceutical business through the successful development and commercialization of differentiated products for the treatment of diseases with unmet medical need in high-value therapeutic areas. Key elements of our strategy are as follows:

*Concentrate our resources on our two prioritized product development programs, MN-221 and MN-166/AV411.* We intend to enter into strategic alliances with leading pharmaceutical or biotech companies to support further clinical development of both MN-221 and MN-166/AV411 in the United States. We may also decide to pursue potential partners and potential acquirers of license rights to our programs in markets outside the United States, with the goal of retaining significant commercial participation in these product opportunities.

*Pursue additional indications and commercial opportunities for our prioritized product candidates.* We will seek to maximize the value of MN-221 and MN-166/AV411 by pursuing other potential indications and commercial opportunities for such product candidates. For example, we have rights to develop and commercialize MN-221 for any disease or indication. In addition to the ongoing evaluation of MN-221 for the treatment of acute exacerbations of asthma, we expanded our development program for MN-221 to evaluate MN-221 for the treatment of COPD exacerbations utilizing our existing IND for MN-221.

*Maximize the value of the remainder of our diversified pipeline of existing product candidates.* We will conduct development activities strategically on the remainder of our existing product candidates, to the extent that we deem any further activities necessary to maintain our license rights or maximize their value, while aggressively pursuing a variety of initiatives to monetize these product candidates on appropriate terms.

*Opportunistically in-license additional product candidates through our global industry relationships.* Over the long term, we intend to expand our pipeline of in-licensed product candidates by continuing to cultivate and strengthen our business relationships with pharmaceutical companies in Japan and other markets. We believe our ability leverage industry relationships to acquire product candidates with high potential and existing preclinical or early clinical data from Japanese pharmaceutical companies provides us with a competitive advantage over other drug development companies in the U.S. market. We believe that additional diversification and expansion of our pipeline of product candidates will help maximize the commercial opportunity and mitigate the risks inherent in drug discovery and development.

*Strategically partner with pharmaceutical companies who are leaders in their fields to complete late stage product development and successfully commercialize our products.* We develop and maintain business development relationships with pharmaceutical therapeutic area leaders who seek late stage product candidates to complete development and commercialization. We intend to select partners with demonstrated ability to complete late stage development and successfully commercialize product candidates. To ensure our ability to build a sustainable business, we may selectively add commercial capabilities to our management team to support our evolution into a commercial entity as our product development programs mature.

### **Product Development Programs**

Our product development programs address diseases that we believe are not well served by currently available therapies and represent significant commercial opportunities. We believe that our product candidates offer innovative therapeutic approaches that may provide significant advantages relative to current therapies.

Our product acquisitions have focused primarily on product candidates with significant preclinical and early clinical testing data that have been developed by the licensors outside of the United States. We utilize the

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existing data in preparing INDs or foreign equivalents and designing additional clinical trials to advance the regulatory approval process in the United States or abroad. Following are details of our product development programs:

*Prioritized Product Candidates*

The current state of the development program for each of our two prioritized product candidates is described below.

*MN-221 for Acute Exacerbations of Asthma*

*Indication Overview and Market Opportunity.* An acute exacerbation of asthma is a long-lasting and severe asthma episode in which asthma symptoms are not responsive to initial bronchodilator or corticosteroid therapy. Acute exacerbations of asthma are an emergency situation that can lead to emergency department treatment and, in some cases, hospital admission or death. Beta-agonist agents are the mainstays of acute treatment for these types of asthma attacks and are included in the recommended standard of care according to the National Guideline Clearinghouse from the U.S. Department of Health and Human Services, or DHHS, for patients suffering from acute exacerbations of asthma.

Data from the National Center for Health Statistics show that visits to emergency departments for asthma increased from approximately 1.5 million in 1992 to approximately 1.7 million in 2006. There were approximately 456,000 hospital discharges and approximately 3,447 deaths due to asthma during 2007, according to the National Center for Health Statistics. Despite significant improvements in the treatment for asthma over the past 20 years, there has not been a corresponding decrease in hospitalizations due to asthma according to the National Center for Health Statistics (e.g. there were approximately 423,000 hospital discharges due to asthma in 1998). According to the National Heart, Lung and Blood Institute, the direct costs associated with hospital care due to asthma were estimated at \$5.5 billion in 2010. We believe that there remains an unmet medical need for a safe and effective treatment for acute exacerbations of asthma that could prevent some of these hospitalizations.

*Overview of MN-221 in Acute Exacerbations of Asthma.* MN-221 is a novel, highly selective  $\beta_2$ -adrenergic receptor agonist being developed for the treatment of acute exacerbations of asthma. We licensed MN-221 from Kissei Pharmaceutical in February 2004. Preclinical studies conducted *in vitro* and *in vivo* showed MN-221 to be highly selective for the  $\beta_2$ -adrenergic receptor. In these studies, the  $\beta_1$ -adrenergic receptor stimulating activity of MN-221 was less than that of other  $\beta_2$ -adrenergic receptor agonists in isolated rat atrium and *in vivo* cardiac function tests in rats, dogs and sheep, thereby suggesting that the stimulating action of older, less selective  $\beta_2$ -adrenergic receptor agonists on the heart via  $\beta_1$ -adrenergic receptors may be reduced with MN-221 due to its greater  $\beta_2$ -adrenergic receptor selectivity. *In vitro* studies also suggested that MN-221 may act as only a partial  $\beta_1$ -adrenergic receptor agonist in cardiac tissue, while acting as a full  $\beta_2$ -adrenergic receptor in lung tissue. In addition, a preclinical drug interaction study in dogs completed during 2008 demonstrated that, while each of albuterol and MN-221 induced an increase in heart rate independently, the addition of MN-221 by intravenous administration in combination with inhaled albuterol did not add to the heart rate increase associated with inhaled albuterol alone, which further suggests that MN-221 acts as a partial agonist at  $\beta_1$ -adrenergic receptors. We believe that this improved receptor binding and functional selectivity may result in fewer cardiovascular side effects than are commonly observed with other  $\beta_2$ -adrenergic receptor agonists used to treat this condition. We have developed and studied an intravenous formulation of MN-221 appropriate for hospital use.

*Clinical Results.* We completed a randomized, double-blind, placebo-controlled, dose escalation, multi-center Phase II clinical trial of MN-221 in 23 stable mild-to-moderate asthmatics in August 2007. At each dose level in the escalation, patients were randomized to receive either a 15-minute intravenous infusion of MN-221 or placebo. This clinical trial achieved statistical significance in its primary endpoint of mean change in forced expiratory volume in one second, or FEV<sub>1</sub>, from baseline to measurement at 15 minutes (the end of the infusion)

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at doses of 10, 16, 30 and 60 micrograms per minute of MN-221 (p-value less than or equal to 0.0006) compared to placebo. MN-221 produced a significant linear, dose-related increase in mean change in post-infusion FEV<sub>1</sub> from baseline (p-value less than or equal to 0.0001) following a 15-minute intravenous infusion of MN-221. Significant improvements in mean change in post-infusion (15 minute) FEV<sub>1</sub> from baseline were observed at doses of 10, 16, 30 and 60 micrograms per minute (p-value less than or equal to 0.0006) and at the dose of 3.5 micrograms per minute (p-value=0.0106) compared to placebo. In the protocol correct population for this clinical trial, which consisted of 21 patients, the dose-related increases in FEV<sub>1</sub> were maintained for four hours (p-value=0.0393) and at eight hours (p-value=0.0424) following the 15-minute infusion of MN-221. MN-221 was well tolerated in this Phase II clinical trial, with only the expected  $\beta_2$ -adrenergic receptor pharmacology noted in some patients (e.g., fall in serum potassium, elevation in plasma glucose, mild headache and mild tremors). There were no clinically significant cardiovascular, electrocardiogram, or ECG, or vital sign changes observed at any dose tested. In addition, no serious adverse effects were observed in this clinical trial.

We completed a randomized, open-label, placebo-controlled Phase II clinical trial to evaluate the safety and efficacy of MN-221 in patients with moderate to severe, but stable asthma, which involved 17 patients in two dose cohorts, in September 2008. In one dosing cohort, each patient received MN-221 at a dose of 1,125 micrograms or placebo over one hour by a continuous intravenous infusion. In the other dosing cohort, each patient received MN-221 at a dose of 1,080 micrograms or placebo over two hours by a continuous intravenous infusion. Both infusion rates of MN-221 produced a marked and clinically significant improvement in FEV<sub>1</sub>. FEV<sub>1</sub> results were expressed as percent predicted based on standard reference equations accounting for an individual's race, gender, age and height. At the end of the one-hour infusion, FEV<sub>1</sub> increased by 17.5 percent predicted for MN-221 compared to an increase of three percent predicted for placebo. At the end of the two-hour infusion, FEV<sub>1</sub> increased by an average of 12.1 percent predicted for MN-221 compared to an increase of 1.4 percent predicted for placebo. In accordance with the study protocol, no inferential statistical testing was performed. MN-221 was well tolerated by the patients who received either infusion rate of MN-221. There were no clinically significant safety concerns noted among adverse events, ECG data, vital sign data or laboratory assessments collected throughout this clinical trial.

We completed a randomized, modified single-blind, placebo-controlled, dose escalation Phase II clinical trial to evaluate MN-221 in patients with severe, acute exacerbations of asthma in emergency departments, which included 29 patients (13 treated with standard care only and 16 treated with MN-221 plus standard care) at planned escalating doses of 240 to 1,080 micrograms, in April 2009. All patients received standardized care consisting of inhaled albuterol, ipratropium and oral steroid treatment. No safety concerns with adding MN-221 to standardized care were identified following review of ECG, laboratory and adverse experience data. The hospitalization rate among patients treated with standardized care only was 46 percent (six of 13), which was the anticipated rate, compared to a hospitalization rate of 25 percent (four of 16) among patients receiving MN-221 plus standardized care. Improvement in FEV<sub>1</sub> values generally appeared to be greater for patients receiving MN-221 in addition to standardized treatment. As specified in the protocol for this clinical trial, no inferential statistics (e.g., p-values) were calculated for this study.

*Development Plans.* In January 2009, we initiated a randomized, double-blind, placebo-controlled Phase II clinical trial designed to evaluate the safety and efficacy of MN-221 in patients with severe, acute exacerbations of asthma in emergency departments. We are utilizing clinical sites primarily in North America (including a majority of the clinical sites that participated in the smaller Phase II clinical trial concluded in April 2009) to enroll approximately 200 patients in this clinical trial, which is designed to compare standardized care to standardized care plus MN-221 at a dose of 1,200 micrograms administered over one hour. Once a patient has received the initial standardized care treatment regimen, the patient will be assessed for response to that treatment. If the patient's FEV<sub>1</sub> is less than or equal to 50 percent of predicted and the patient meets all other study entry criteria, the patient will be randomized to receive either MN-221 or placebo. Patients enrolled in the clinical trial will continue to receive standardized care as needed. The primary efficacy endpoint will be improvement in FEV<sub>1</sub>.

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If we are successful in completing this Phase II clinical trial in the second half of 2011, we anticipate requesting an End-of-Phase II meeting with the FDA. If we are successful in entering into a strategic collaboration or raising additional capital, we would subsequently initiate our planned Phase III program.

*MN-221 for Chronic Obstructive Pulmonary Disease Exacerbations*

*Indication Overview and Market Opportunity.* A COPD exacerbation is a sustained worsening of the patient's condition, from the stable state and beyond normal day-to-day variations, that is acute in onset and necessitates a change in regular medication in a patient with underlying COPD. Exacerbations are associated with a significant increase in mortality, hospitalization and healthcare utilization. According to data from the National Heart, Lung, and Blood Institute, an estimated 12.1 million adults had a diagnosis of COPD in the United States in the year 2001 and about 24 million adults have evidence of impaired lung function indicating that COPD is underdiagnosed. According to data from the National Heart, Lung, and Blood Institute, in the year 2000, there were 119,000 deaths, 726,000 hospitalizations, and 1.5 million hospital emergency department visits due to COPD in the United States. The age-adjusted death rate for COPD increased more than 30 percent since 1980, according to a 2010 report on COPD from the American Lung Association, which used data from the Centers for Disease Control and Prevention. In 2002, according to the National Heart, Lung, and Blood Institute, direct costs for COPD were \$18.0 billion and indirect costs were \$14.1 billion in the United States. In 2010, according to the American Lung Association, the direct costs for COPD were approximately \$29.5 billion and indirect costs were approximately \$20.4 billion in the United States. We believe there remains an unmet medical need for a safe and effective treatment for COPD exacerbations that could prevent some of these hospitalizations.

*Overview of MN-221 in COPD Exacerbations.* In July 2009, we announced our plan to evaluate MN-221 for the treatment of COPD exacerbations. Inhaled  $\beta_2$ -adrenergic receptor agonists, which are the current standard of care, are often inadequate to control the symptoms of COPD exacerbations. We believe that MN-221 may offer an immediate intravenous delivery for this life-threatening condition for patients who cannot get the full benefit from treatment with inhaled  $\beta_2$ -adrenergic receptor agonists due to severe bronchoconstriction. In addition, we believe that MN-221 may offer the potential for fewer cardiovascular side effects than older  $\beta_2$ -adrenergic receptor agonists due to its greater selectivity for the  $\beta_2$ -adrenergic receptor. This could be very significant due to the relative older age population seen in COPD patients who tend to have more underlying heart disease.

*Clinical Results.* We completed a randomized, double-blind, placebo-controlled Phase Ib study involving 48 moderate-to-severe COPD patients who received a one hour intravenous infusion of MN-221 at three different escalating dose levels (300 micrograms, 600 micrograms, or 1200 micrograms) or placebo in the first quarter of 2010. In March 2010, based on preliminary findings, we announced that all doses of MN-221 produced a clinically significant improvement in FEV<sub>1</sub> (L) as compared to the baseline and placebo. At the end of the one hour infusion, FEV<sub>1</sub> (L) increased as compared to baseline by an average of 21.5 percent (p=0.0025) for the 1200 micrograms dose, 16.2 percent (p=0.020) for the 600 micrograms dose, and 9.2 percent (p=NS) for the 300 micrograms dose compared to a decrease of 4.0 percent for the placebo. MN-221 at doses of 600 micrograms and 1200 micrograms appeared to have an effect for at least six hours as compared to placebo. MN-221 was well tolerated by all patients who received infusions of MN-221.

*Development Plans.* We are now considering the next steps for the COPD development program.

*Ibudilast (MN-166/AV411): AV411 for Neuropathic Pain and Drug Addiction*

The AV411 portfolio, which includes the Phase II-staged lead drug compound and proprietary analogs, represents novel, first-in-class, non-opioid drugs for the treatment of several large pain and drug addiction indications. AV411 is a first-in-class, orally bioavailable small molecule, a glial attenuator that suppresses pro-inflammatory cytokines IL-1 $\beta$ , TNF- $\alpha$ , and IL-6, and may upregulate the anti-inflammatory cytokine IL-10. It has additionally been shown to be a toll-like receptor 4 (TLR4) functional antagonist that may contribute to its attenuation of neuroinflammation. While considered a New Molecular Entity, or NME, in the



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United States and Europe, it involves redirection of an approved drug, ibudilast, which was first approved in Japan more than 20 years ago. Ibudilast has been prescribed to over one million patients for a different indication and has a good post-marketing safety profile as reported in nearly 15,000 patients studied at the prescribed doses.

Based on our research, we have filed for patents protecting multiple uses of AV411 in neurological conditions, as well as for patents on AV411 analogs which we believe have the potential to be effective second generation molecules. As NMEs, AV411 and its analogs would be entitled to five years of marketing exclusivity from first approval in the U.S. and up to 10 years of exclusivity in the European Union.

*Neuropathic pain:* Glial activation in the brain and spinal cord contribute to the establishment and amplification of the chronic pain state. As part of Avigen's program investigating glial attenuation as a novel approach to the treatment of neuropathic pain, Avigen conceived and demonstrated that AV411 was efficacious in preclinical models of neuropathic pain and may be effective in a wide range of neuropathic pain syndromes including neuropathy, post-herpetic neuralgia, HIV neuropathy, radiculopathy, spinal cord injury and chemotherapy-induced neuropathy. While ibudilast was initially developed as a non-selective phosphodiesterase (PDE) inhibitor for the treatment of bronchial asthma, its efficacy in some neuropathic pain models appears to be independent of this activity and yet still linked to glial attenuation.

AV411 has advanced through multiple Phase I and IIa clinical trials in both healthy volunteers and patients for neuropathic pain, inclusive of a Phase Ib/IIa clinical trial in diabetic neuropathic pain. The program, under current FDA standards, is able to enter Phase II development for neuropathic pain in the United States based on completed Avigen preclinical and clinical development.

*Opioid withdrawal:* AV411 completed a Phase Ib/IIa clinical trial in opioid withdrawal and analgesia, or OWA, funded by NIDA and conducted at Columbia University by leading specialists in the study and treatment of substance abuse. AV411 and analogs have been shown in preclinical models of opioid (morphine or oxycodone) withdrawal to significantly reduce withdrawal symptoms. Moreover, AV411 attenuates both behavioral and neurochemical markers of opioid reward. AV411 and analogs are differentiated from other drug candidates in clinical trials that may demonstrate similar effects, in that AV411 and analogs are not narcotics and do not, themselves, provide reward or reinforcement in behavioral models of dependence. Thus, while current therapies involve substitution of one opioid for another (e.g. methadone for heroin), AV411 represents a novel, non-opioid, approach for the treatment of opioid withdrawal and dependence. Results from the recently-completed OWA trial indicated dose-related attenuation of the opioid withdrawal syndrome ( $p < 0.05$  for 80 mg/d treatment arm relative to placebo control on the Subjective Opioid Withdrawal Scale (SOWS) endpoint) and enhanced opioid analgesia ( $p < 0.05$  for the McGill Pain Questionnaire endpoint for the 80 mg/d treatment arm vs placebo control). Other measures of withdrawal (Clinicians Opioid Withdrawal Scale) or analgesia (quantitative time endpoints for cold pressor test) were not significantly attenuated.

*Methamphetamine addiction:* In collaborative studies with NIDA, AV411 has demonstrated utility in methamphetamine relapse in animals which translated into a NIDA-funded exploratory Phase Ib methamphetamine interaction clinical trial with investigators at the University of California Los Angeles.

*Development Plans.* We are not planning to undertake any further significant clinical development of AV411 until such time that we are successful in entering into a strategic collaboration to support further clinical development of our combined MN-166/AV411 ibudilast-based programs. We are actively pursuing potential partners for such purpose.

*Ibudilast (MN-166/AV411): MN-166 for Multiple Sclerosis*

*Indication Overview and Market Opportunity.* MS is an inflammatory disease of the CNS in which the body's immune system attacks the protective sheath surrounding nerve fibers. According to the National Multiple Sclerosis Society, MS affects approximately 400,000 people in the United States and approximately

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2.5 million people worldwide. In addition, according to the National Multiple Sclerosis Society, approximately 200 people are diagnosed with MS in the United States each week. The most obvious effect of MS is its destruction of nerve fibers leading to the loss of muscle control. However, MS also affects multiple CNS functions. Currently, there is no known cure for the disease. According to the National Multiple Sclerosis Society, relapsing-remitting MS, or RRMS, is the most common type of the disease, and 85 percent of people with MS are initially diagnosed with RRMS. Secondary-Progressive MS (SPMS) follows an initial period of RRMS. According to sales data included in the most recent annual reports of the leading MS drug companies, including Biogen Idec Inc., Merck Serono S.A., Teva Pharmaceuticals Industries Ltd. and Bayer Schering Pharma AG, worldwide sales of drugs to treat MS exceeded \$11.0 billion in 2010.

The aim of treatment is to relieve symptoms of acute attacks by reducing the frequency of relapses and limiting the disabling effects of relapses and to minimize disability caused by disease progression. Steroids are used in treating MS to decrease the severity and shorten the duration of the attacks, but they do not change the course of the disease. Corticosteroid use is normally limited to the short-term treatment of MS, perhaps over a period of one to three weeks, as it generally is believed that the side effects and safety risks of long-term corticosteroid therapy outweigh clinical benefits in extended MS treatment. More recently, immunosuppressive agents and techniques have been introduced for the treatment of MS. However, these treatments are only partially effective and certain side effects may preclude their widespread use. These treatments may slow the course of disease progression and mitigate its effects temporarily, but additional drugs are often required to address the various CNS dysfunctions caused by the disease. We believe drugs for the treatment of MS that can be taken with less discomfort, particularly those that can be taken orally, with efficacy equal or better than the available treatments for MS would have widespread appeal.

*Overview of MN-166.* We licensed MN-166 from Kyorin Pharmaceutical in October 2004. MN-166 has been marketed in Japan and Korea since 1989 to treat cerebrovascular disorders and bronchial asthma. In preclinical *in vivo* and *in vitro* studies, MN-166 inhibited leukotriene activity, phosphodiesterases and nitric oxide synthase, all of which are inflammatory mechanisms known to be involved in MS. These studies also suggested that MN-166 may suppress the production of pro-inflammatory cytokines (IL-1 $\beta$ , TNF- $\alpha$  and enhance the production of the anti-inflammatory cytokines (IL-4, IL-10). Based on the potential mechanisms of action of MN-166, its clinical safety history in Japan, the results of pilot studies conducted by Kyorin Pharmaceutical in MS patients and the issuance of a U.S. patent covering the method of using MN-166 to treat the disease, we decided to pursue development of MN-166 as a novel, oral agent for the treatment of MS.

*Clinical Results.* Based on its anti-inflammatory activity and safety profile, MN-166 was evaluated for potential activity in MS in two pilot clinical trials sponsored by academic investigators in Japan. In one open-label pilot clinical trial, the investigators studied the effects of MN-166 on relapse rates in six MS patients who had a mean of four relapses per year. Following 12 to 20 months of treatment with MN-166, the average relapse rate was reduced. Over this time frame, there was no significant change in the mean Expanded Disability Status Score, or EDSS, a measure of MS drug efficacy and disease progression. No side effects of MN-166 were reported in this clinical trial. In a second pilot trial involving 12 MS patients receiving MN-166 for four weeks, MN-166 tended to normalize the levels of several chemical mediators of inflammation, including TNF- $\alpha$  and interferon gamma.

We completed a two-year Phase II multi-center, randomized, double-blind, placebo-controlled clinical trial of MN-166 for the treatment of patients with relapsing MS in April 2008. This clinical trial involved 297 patients with relapsing MS in several countries in Eastern Europe. Patients received either 30 mg of MN-166 per day, 60 mg of MN-166 per day or a placebo. In the second year of the study, all patients received active drugs. Patients who received 30 or 60 mg of MN-166 per day during the first year of the study remained on the assigned dose for the second 12 months of the study; patients who received placebo during the first 12 months of the study were randomized to receive either 30 or 60 mg of MN-166 per day (double-blind maintained) during the second 12 months of the study. Clinical and radiological outcomes were evaluated. MN-166 treatment resulted in positive findings on three independent measures indicative of a potential disease-progression modifying effect. First,

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sustained disability progression was significantly less likely (by approximately 50 percent) in those patients receiving MN-166 at either 30 or 60 mg per day for 24 months than in those patients receiving the drug for 12 months ( $p=0.026$ ). Sustained disability progression was measured as a greater than or equal to 1.0 point increase from baseline in the EDSS score for four consecutive months. Second, the significant reduction in brain volume loss ( $p=0.035$ ), as measured by cranial MRI scans, observed after 12 months in patients treated with 60 mg per day of MN-166 compared to placebo was again demonstrated in year two of the study. Brain volume loss was significantly less ( $p=0.030$ ) in patients receiving 60 mg per day of MN-166 for 24 months compared to the other treatment groups. Third, MN-166 treatment at 60 mg per day significantly reduced the relative risk for conversion of new inflammatory lesions identified at month two to PBHs eight months later at month ten by 37 percent ( $p=0.011$ ); such lesions that remain unchanged for eight months are considered PBHs as compared to transient inflammatory lesions that are more closely associated with relapses. MN-166 treatment at 30 mg per day resulted in a trend toward reducing evolution to PBH ( $p=0.074$ ). MN-166 was well tolerated at all doses over the two years of this clinical trial, with the most common adverse events possibly related to MN-166 involving mild, transient gastrointestinal disturbances and depression. Of the 297 patients enrolled in this clinical trial, 245 patients completed the full two years of treatment. In September 2008, data from this completed two-year clinical trial was presented at the World Congress for Treatment and Research in MS.

*Development Plans.* At present, with the acquisition of AV411 in December 2009, we are not planning to undertake any further significant clinical development of MN-166 until such time that we are successful in entering into a strategic collaboration to support further clinical development of our combined MN-166/AV411 ibudilast-based programs. We are actively pursuing potential partners for such purpose.

### *Other Product Candidates*

We intend to limit development activities on the balance of our ten product candidates. For each of these product candidates, we plan to conduct development activities only to the extent that we deem any further activities necessary to maintain our license rights or maximize its value, while pursuing a variety of initiatives to monetize such product candidate on appropriate terms. The status of the development program for each of these non-prioritized product candidates is described below.

#### *MN-001 for Asthma*

*Indication Overview and Market Opportunity.* Asthma is a chronic inflammatory disease of the airways in which symptom control is the key to effective disease management. Alleviation of acute asthmatic symptoms and blocking of late phase inflammation are both important to asthma therapy. According to the CDC and the Global Initiative for Asthma, there are approximately 24.6 million asthma patients in the United States and over 300 million asthma patients worldwide.

According to the most recent annual reports of the leading asthma drug companies, GlaxoSmithKline plc, Merck & Co., Inc., AstraZeneca plc and Roche Holding Ltd., worldwide sales of asthma therapeutics increased to over \$22 billion in 2010. Leading treatments currently include inhaled corticosteroids, bronchodilators and leukotriene antagonists. Worldwide sales of the Flovent<sup>®</sup> and Pulmicort<sup>®</sup> inhaled corticosteroids were over \$2.1 billion in 2010 according to the annual reports of GlaxoSmithKline plc and AstraZeneca plc. Inhaled steroids, such as Flovent<sup>®</sup> (fluticasone) and Vanceril<sup>®</sup> (beclomethasone), are more broadly effective in blocking late phase inflammation, but their general side effects require careful monitoring. Leukotriene antagonists, such as Singulair<sup>®</sup> (montelukast) or Accolate<sup>®</sup> (zafirlukast), became available as a new asthma therapy in the late 1990s. These drugs block the actions of leukotrienes, which are pro-inflammatory chemical mediators, and the subsequent inflammation caused by eosinophil migration to the lungs. According to Merck & Co., Inc.'s 2010 Annual Report, worldwide sales of Singulair<sup>®</sup>, a leading leukotriene antagonist, were \$5.0 billion in 2010.

*Overview of MN-001 in Asthma.* MN-001 is a novel, orally bioavailable compound being developed for the treatment of bronchial asthma. We licensed MN-001 from Kyorin Pharmaceutical in March 2002. In *in vivo* preclinical studies conducted by Kyorin Pharmaceutical and us, MN-001 combined the positive attributes of the leukotriene antagonists and inhaled steroids, while maintaining an acceptable safety profile.

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In preclinical pharmacology studies, MN-001 inhibited airway hyper-reactivity through a reduction of airway inflammation. *In vitro* studies and animal studies also suggested that MN-001 may affect many of the downstream mechanisms activated by mast cell degranulation, which is the release of chemicals that cause inflammation. MN-001 also demonstrated that it is a potent inhibitor of pro-inflammatory enzymes *in vitro* (e.g., 5-lipoxygenase and phosphodiesterase 4), as it prevented migration of inflammatory cells to the lungs of rodents in these studies. In addition, in guinea pig asthma models, MN-001 was more selective than steroids in affecting cells involved in the inflammatory process and not those involved in cellular immunity.

*Clinical Results.* MN-001 has proven to be well tolerated in early clinical testing. Treatment-related adverse effects, primarily consisting of gastrointestinal discomfort such as diarrhea, loose stools, nausea and upper abdominal pain, were mild, transient and reversible. These adverse effects were consistent with findings in preclinical studies.

We conducted a randomized, double-blind, placebo-controlled, multi-center Phase II clinical trial in patients with mild-to-moderate asthma, which was completed in the fourth quarter of 2005. In this clinical trial, 147 patients were randomly assigned to receive placebo or MN-001 tablets in one of three oral dosing regimens for four weeks. The primary endpoint of the trial was achieved with a statistically significant improvement in FEV<sub>1</sub> after four weeks of treatment with 500 mg of MN-001 at three times daily dosage, or TID, compared to placebo (p-value=0.021; intent-to-treat, observed cases). A similar trend was observed for the 750 mg two times daily dosage, or BID, of MN-001 (p-value=0.058). Positive trends in secondary outcome measures were also observed in the 500 mg TID treatment group, including serial spirometry, morning and evening peak flow rates, and provocative concentration causing a 20 percent fall in FEV<sub>1</sub>, or PC20, values in a methacholine challenge test, each of which is a common measure of respiratory function. MN-001 was well tolerated in this clinical trial with 89 percent of patients completing four weeks of treatment. There was no apparent difference between placebo and any of the active treatment groups in adverse events leading to discontinuation or in adverse events attributable to treatment.

### *MN-001 for Interstitial Cystitis*

*Indication Overview and Market Opportunity.* IC is a chronic disease of the bladder characterized by urinary frequency and urgency, nighttime urination and pelvic and bladder pain. It is widely believed that IC is due to an altered or defective bladder lining and an increased number of activated bladder mast cells, which are specialized cells that release biochemicals and cause inflammation. According to the National Kidney and Urologic Diseases Information Clearinghouse, which is a division of the National Institutes of Health, an estimated 1.3 million patients suffer from IC in the United States, and more than one million of them are women. We believe that IC is currently underdiagnosed and that the market for drugs that treat IC will likely expand with the introduction of effective new treatments.

*Overview of MN-001 in Interstitial Cystitis.* MN-001 is a novel, orally bioavailable, anti-inflammatory compound being developed for the treatment of IC. Data that we collected in connection with the development of MN-001 for bronchial asthma and data collected by Kyorin Pharmaceutical provided us with a strong scientific rationale for evaluating MN-001 as an oral treatment for IC. MN-001 has been shown to block a number of the inflammatory mechanisms activated by mast cell degranulation that are important in the pathogenesis of inflammatory disorders, including IC and asthma (e.g., leukotriene receptor antagonism and inhibition of phosphodiesterases III and IV, 5-lipoxygenase, phospholipase C and thromboxane A2). In addition, MN-001 produced anti-inflammatory effects in a variety of rodent models of IC and asthma; in these models, MN-001 reduced bladder hyper-reactivity much in the same way that it reduced airway hyper-reactivity in the lung.

*Clinical Results.* We conducted a randomized, double-blind, placebo-controlled multi-center Phase II clinical trial in patients with moderate-to-severe IC, which was completed in the first quarter of 2007. This clinical trial involved 305 patients at 37 clinical sites in the United States. Results from this clinical trial indicated that, while well-tolerated, MN-001 did not show a statistically significant clinical benefit compared to

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placebo on the primary endpoint (to be much or very much improved overall on a patient-rated global response assessment) at the doses tested in this clinical trial (500 mg once or twice a day for eight weeks). Results from this clinical trial also indicated that IC patients were more than twice as likely to respond on 500 mg of MN-001 administered twice a day compared to placebo (25 percent compared to 12 percent, p-value=0.04) after four weeks of treatment. This difference, however, was not observed at eight weeks due to continued improvement among placebo-treated patients. The response rate of patients treated with 500 mg of MN-001 once a day did not significantly differ from placebo at either four or eight weeks.

### *MN-029 for Solid Tumors*

*Indication Overview and Market Opportunity.* The American Cancer Society estimates that more than 1.5 million Americans were diagnosed with cancer in 2010, of which more than 750,000 patients were diagnosed with lung, prostate, colon, rectum or breast solid tumor cancers. The American Cancer Society also estimates that approximately 569,000 patients were ultimately to die from cancer in 2010. According to IMS Health, the global market for oncology products exceeded \$48.0 billion in 2008.

Tumor blood vessels are a promising target for cancer therapy. Compounds that act to deprive tumors of their blood supply fall into two classes: angiogenesis inhibitors and vascular disrupting agents, or VDAs. Angiogenesis inhibitors block the formation of new blood vessels formed in response to tumor growth, whereas VDAs disrupt blood flow through existing tumor blood vessels. We believe that VDAs have a potential advantage over angiogenesis inhibitors because VDAs work on existing tumor blood vessels and can kill hundreds of cancer cells that depend on that blood supply with even a brief interruption in blood flow, rather than simply slowing tumor growth by blocking new blood vessel formation.

*Overview of MN-029.* MN-029 is a novel, small molecule VDA being developed for the treatment of solid tumors. We licensed MN-029 from Angiogene Pharmaceuticals in June 2002. Several preclinical pharmacology studies conducted by Angiogene Pharmaceuticals and us have assessed the mechanism of action and anti-tumor activity of MN-029 *in vivo* in rodent models of breast adenocarcinoma, colon carcinoma, lung carcinoma and KHT sarcoma. In these studies, MN-029 damaged poorly formed tumor blood vessels by weakening tumor blood vessel walls and causing leakage, clotting and eventual vascular shutdown within the tumor. These studies suggest that MN-029 acts quickly and is rapidly cleared from the body, which may reduce the potential for some adverse effects commonly associated with chemotherapy. Shutdown of tumor blood flow in tumor models was confirmed through the use of dynamic contrast-enhanced magnetic resonance imaging, or DCE-MRI.

*Clinical Results.* To date, we have conducted two Phase I clinical trials of MN-029 for the treatment of solid tumors, which completed in 2006 and 2007, respectively.

In the first Phase I clinical trial, MN-029 was administered as an intravenous infusion once every three weeks. Results from this clinical trial showed that MN-029 was well tolerated at doses that reduced tumor blood flow. A maximum tolerated dose of 180 mg/m<sup>2</sup> per dose was established in this clinical trial. The most common side effects of MN-029 were characteristic of other VDAs and included nausea, vomiting, fatigue and diarrhea. Nine of 34 patients with advanced solid tumors for whom no standard therapy was available had stable disease after three cycles of treatment. Six patients had prolonged (greater than six months) stable disease. Although no patients showed objective responses based on Response Evaluation Criteria in Solid Tumors, or RECIST criteria, which is tumor length on computed tomography, or CT, or MRI scans, semi-automated measurements of tumor volumes from CT scans showed a measureable reduction in tumor burden in the subject with the largest reduction in tumor blood flow (Ktrans -40 percent). Tumor blood flow reduction assessed by dynamic contrast-enhanced magnetic resonance imaging, or DCE-MRI, was recorded at doses greater than or equal to 120 mg/m<sup>2</sup>.

In the second Phase I clinical trial, MN-029 was administered as an intravenous infusion every seven days (days 1, 8, 15) followed by a 13-day recovery period (one cycle). Results from this clinical trial showed that MN-029 was well tolerated. The maximum dose was limited to 180 mg/m<sup>2</sup> per dose based on the results of the

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other Phase I trial that employed a less aggressive dosing schedule. The most common side effects of MN-029 in this clinical trial included nausea, vomiting, arthralgia and headache. Eleven of 20 patients with advanced solid tumors for whom no standard therapy was available had stable disease after two cycles of treatment. Four subjects continued on extended cycles of MN-029 treatment. Based on RECIST criteria, one patient with metastatic pancreatic cancer had an overall partial response with a duration of 74 days. Seven patients had stable disease with a median duration of 83 days.

*MN-305 for Generalized Anxiety Disorder/Insomnia*

*Indication Overview and Market Opportunity.* The essential characteristic of Generalized Anxiety Disorder is excessive, uncontrollable worry about everyday events. This constant worry affects daily functioning and can cause severe physical symptoms. Generalized Anxiety Disorder can occur with other anxiety disorders, depressive disorders or substance abuse. Generalized Anxiety Disorder is often difficult to diagnose because it is not triggered by a specific object or situation. The intensity, duration and frequency of the worry are disproportionate to the issue. As a result, Generalized Anxiety Disorder tends to interfere with the patient's performance of tasks and ability to concentrate. According to the National Institute of Mental Health, anxiety disorders affect approximately 40 million American adults, of whom approximately 6.8 million suffer from Generalized Anxiety Disorder. Anxiety disorders are the most prevalent of neuropsychiatric conditions, yet are generally considered to be under-diagnosed and therefore undertreated. Therefore, we believe that there is a significant opportunity for the introduction of new anxiety reducing drugs.

A variety of pharmacologic agents are used to manage patients with anxiety disorders. Benzodiazepines have been the mainstay of the treatment of acute anxiety since the late 1960s. However, their efficacy as a treatment has been limited by problems faced in chronic use due to their sedative effects. In the late 1980s, buspirone was introduced and widely used even though it takes effect slowly. Buspirone was well tolerated and relatively safe. During the late 1990s, newer anti-depressants, notably the specific serotonin reuptake inhibitors, or SSRIs, were increasingly used to treat anxiety as well. While effective, the use of SSRIs may result in a variety of undesirable side effects, including agitation and sexual dysfunction. Also, SSRIs may take weeks to exert their beneficial effects.

*Overview of MN-305 in Generalized Anxiety Disorder/Insomnia.* MN-305 is a serotonin receptor agonist with high affinity and selectivity for the serotonin 5-HT<sub>1A</sub> receptor subtype. Drugs that act through this mechanism, such as buspirone, have been proven to be clinically effective in treating Generalized Anxiety Disorder. We licensed MN-305 from Mitsubishi Pharma Corporation, now Mitsubishi Tanabe Pharma Corporation, in April 2004. MN-305 has been shown to be more potent than buspirone and to exhibit anti-anxiety efficacy in a wide range of preclinical rodent models. For example, in a social interaction test, MN-305 prolonged the duration of social interaction in rats. Preclinical and clinical studies conducted by Mitsubishi Tanabe Pharma Corporation and us also suggest that MN-305 may have a more rapid onset of action than buspirone.

*Clinical Results.* Preliminary evidence of anti-anxiety efficacy was provided by a six-week, open-label, fixed-flexible dose Phase II clinical trial conducted by Mitsubishi Tanabe Pharma Corporation in Japan in 61 patients with neurotic disorders. The neurotic disorders included Generalized Anxiety Disorder, panic disorder, agoraphobia, mixed anxiety and depressive disorder and dysthymia. MN-305 was well tolerated, with headaches being the most common side effect in this clinical trial. At the end of the clinical trial, the mean Hamilton Rating Scale for Anxiety score, or HAM-A score, which is a scale used to measure the intensity of anxiety symptoms, was reduced compared to the pre-treatment value. Similarly, a majority of the patients were rated Moderately Improved or better following treatment with MN-305. In addition, MN-305 was well tolerated in several clinical trials conducted by Mitsubishi Tanabe Pharma Corporation in healthy volunteers and patients with anxiety disorders and Major Depressive Disorder. These studies did not evaluate the reduction of anxiety symptoms in patients that were not treated with MN-305.

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The IND for MN-305 was transferred to us from Mitsubishi Tanabe Pharma Corporation, which enabled us to conduct a Phase II randomized, double-blind, placebo-controlled clinical trial in 416 patients with Generalized Anxiety Disorder, which was completed in the second quarter of 2006. The results revealed trends for improvement in all efficacy outcome measures. Statistically significant improvements in the total HAM-A score and in anxious mood, which is item 1 of the HAM-A score and was a secondary endpoint in this clinical trial, were observed through eight weeks of treatment. However, statistical significance on change from baseline of the total HAM-A score after ten weeks of treatment, which was the primary outcome measure of this clinical trial, was not achieved. MN-305 was well tolerated at all doses in this clinical trial, and we believe the findings were sufficiently positive to warrant further clinical evaluation of this product candidate.

We analyzed the results from our Phase II clinical trial of MN-305 in Generalized Anxiety Disorder and performed in-depth analyses of subgroups that showed statistically significant improvement in certain aspects of the HAM-A score (*e.g.*, insomnia). Based on these analyses, we initiated a Phase II proof-of-concept clinical trial of MN-305 for the treatment of insomnia in the first quarter of 2007 to assess the effects of three dosages of MN-305 (1 mg, 3 mg and 6 mg) and placebo, all administered orally approximately 60 minutes before bedtime. This clinical trial, which involved 74 subjects at ten study centers in the United States, was completed in the fourth quarter of 2007. This clinical trial failed to achieve statistical significance in its primary endpoint of reducing Wake (time) After Sleep Onset, or WASO. MN-305 was well tolerated in this clinical trial with no clinically significant adverse events observed at any dose tested, and there was no evidence of any decrements in psychomotor performance, as assessed in digit symbol substitution and symbol copying tests, in patients treated with MN-305. Based upon the results of this clinical trial, we decided to terminate the evaluation of MN-305 for the treatment of insomnia.

### *MN-221 for Preterm Labor*

*Indication Overview and Market Opportunity.* Preterm labor is caused by the onset of uterine contractions before term. According to a November 2002 publication in *Obstetrics & Gynecology*, preterm labor is the leading cause of neonatal mortality and a substantial portion of all birth-related short and long-term morbidity. Successful inhibition of premature birth is known to reduce the risk of complications. Despite extensive research into preterm labor during the past several decades, the rate of premature births has not decreased. According to the National Vital Statistics Reports issued by the DHHS, there were 4.3 million births in the United States in 2007. The 2007 preterm birth rate was 12.7 percent. The DHHS estimates that the costs associated with preterm births is over \$26 billion annually. According to the World Health Organization, six percent to seven percent of all births in Europe occur before term.

Currently, therapy for preterm labor remains targeted at uterine contractions.  $\beta_2$ -adrenergic receptor agonists are generally used as first-line treatments for premature labor. The only FDA-approved treatment for preterm labor is ritodrine, a  $\beta_2$  agonist. However, ritodrine has not been available for sale in the U.S. market since 1999. The more widely used treatment for preterm labor is another  $\beta_2$  agonist, terbutaline; however, this drug is not approved by the FDA for preterm labor. Atosiban, an oxytocin antagonist, is available in Europe, but was denied regulatory approval in the United States. The usefulness of these  $\beta_2$ -adrenergic receptor agonists is often limited by the adverse reactions they produce, which include cardiovascular side effects such as heart palpitations. As a result, we believe that there is a need for treatments with better safety and tolerability profiles that are effective in reducing the premature birth rate and/or providing for longer gestation.

On March 3, 2011, we executed a joint venture agreement with Zhejiang Medicine Co., Ltd. and Beijing Make-Friend Medicine Technology Co., Ltd., which provides for the establishment of a joint venture company to develop and commercialize MN-221 in China. See *Recent Developments*.

*Overview of MN-221 in Preterm Labor.* MN-221 is highly-selective  $\beta_2$ -adrenergic receptor agonist being developed for the treatment of preterm labor. We licensed MN-221 from Kissei Pharmaceutical in February 2004. Preclinical testing *in vitro* and *in vivo* showed MN-221 to be more selective for the  $\beta_2$ -adrenergic receptor

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than other  $\beta_2$ -adrenergic receptor agonists currently used to treat preterm labor. Moreover, *in vitro* studies also suggested that MN-221 may act as only a partial  $\beta_1$ -adrenergic receptor agonist in cardiac tissue, while acting as a full  $\beta_2$ -adrenergic receptor in the uterus. This improved receptor binding and functional selectivity may result in fewer cardiovascular side effects than are commonly observed with other  $\beta_2$ -adrenergic receptor agonists used to treat this condition. In preclinical pharmacology studies in pregnant rats and sheep conducted by Kissei Pharmaceutical, MN-221 reduced the number of spontaneous or drug-induced uterine contractions. Furthermore, in these studies, MN-221 delayed both normal and preterm labor in rats and caused a marked increase in the bodyweight of rat pups as a result of prevention of premature birth. In rat and sheep studies which compared MN-221 to ritodrine and/or terbutaline, the potency of MN-221 was greater than those  $\beta_2$ -adrenergic receptor agonists.

*Clinical Results.* To date, pharmacokinetic and safety data has been generated from human experience with MN-221 through Phase I clinical studies in healthy male and non-pregnant female volunteers conducted by Kissei Pharmaceutical in Japan and the United Kingdom and a Phase I clinical trial in the United States conducted by us. A total of 244 healthy subjects received intravenous infusions of either MN-221 or a placebo. MN-221 was generally well tolerated. A pilot double-blind, placebo-controlled Phase II clinical trial of MN-221 was completed in 2004 by Kissei Pharmaceutical in seven women in preterm labor in the United Kingdom. A trend towards a reduction in the number of uterine contractions was observed in MN-221-treated women and, as a result, only limited conclusions could be drawn from this clinical trial. No