



INITIATION REPORT

Pharmaceutical Industry • October 21, 2009

MANKIND CORPORATION (NASDAQGM: MNKD)

- **Disruptive Technology Creates a New Paradigm for Treating Diabetes and Other Diseases.**
- **The FDA Probably Will Approve Afresa Within the Next Four Months.**
- **Marketing Partner to be Secured With FDA Approval.**
- **We are initiating coverage of Mannkind Corporation with a BUY rating and a target price of \$26.00 per share.**

Mannkind Corporation (NasdaqGM: MNKD) has developed a novel platform technology for pulmonary delivery of therapeutic peptides and proteins. The initial drug formulated with its patented Technosphere technology is a preparation of insulin that immediately releases the hormone in its native form. As a result, Afresa® acts in a manner that closely resembles that of insulin released from the pancreas at mealtime. Indeed, Afresa stands alone in its ability to mimic endogenous insulin release. Mannkind tested this inhalable insulin in thousands of patients prior to filing a marketing application with the Food and Drug Administration on March 16th. Since then, it quickly answered 28 questions that the agency posed and entered into negotiations with experienced marketers. Mannkind plans to promote the drug with a specialty sales force targeting domestic endocrinologists, but it needs assistance in reaching general physicians, as well as foreign markets. We believe news will be forthcoming in the next few months on both a partnering agreement(s) and FDA approval.

Meanwhile, the Company has been applying its Technosphere technology to other hormones with pulsatile release patterns, and it has invested in two oncology drug programs, including one that has yielded novel therapeutic

Share Price (10/20/09)	\$5.08
52-Week Price Low / High	\$2.00 - \$12.30
Mkt. Capitalization (issued)	\$527 M
Shares Outstanding (issued)	112.0 M
12-month Target Price	\$26.00
Website	www.mannkind.com



vaccines for melanoma and refractory solid tumors.

Given the relatively short time before Mannkind completes a partnering agreement(s) and hears from the FDA, we've based our valuation on Afresa sales in the United States and other developed countries. The drug's sales in such emerging markets as China, India, and Russia, plus other therapies in the R&D pipeline, provide upside potential to our valuation. Nonetheless, our discounted cash flow model indicates that Mannkind shares are undervalued.

KEITH A. MARKEY, PH.D.
 212-514-7914
KMARKEY@GRIFFINSECURITIES.COM

INVESTMENT HIGHLIGHTS/KEY POINTS:

MANNKIND HAS A DISRUPTIVE DRUG DELIVERY TECHNOLOGY. The Company has developed a self-assembling particle that is capable of both stabilizing peptide- or protein-based therapies and facilitating their uptake through cell membranes. What's more, the inert Technosphere microparticles are cleared rapidly from the lung and therefore do not pose a threat to pulmonary function. We believe this novel technology will support the development of new therapeutic agents and advance the emerging field of pharmacology known as chronopharmacology, in which the timing of drug delivery is almost as important as the medicine itself.

AFRESA DELIVERS INSULIN IN A PATTERN CLOSELY RESEMBLING THAT OF PANCREATIC ISLET CELLS. Inhalation of Mannkind's insulin results in peak blood levels within 12 to 14 minutes of administration, followed by an exponential decline to near baseline within three hours. This closely approximates changes in circulating insulin observed in individuals with normal pancreatic function.

AFRESA STANDS ALONE AMONGST A MYRIAD OF DIABETES THERAPIES. Research has shown that tight control of glucose levels in diabetic patients protects against the development of such complications as cardiovascular disease and renal failure. This has led to acceptance of short-acting insulin analogs for controlling postprandial glucose levels, often in combination with a long-acting insulin formulation that helps to stabilize glucose during preprandial periods. But even the best short-acting insulin analogs are unable to truly mimic endogenous insulin secretion, and that increases the potential for hypoglycemia – a condition that contributes to the development of dementia. The incidence of mild/moderate and total hypoglycemia associated with Afresa is significantly lower than with today's diabetes medications.

MANNKIND IS NOT A ONE-DRUG PHENOMENON. The Technosphere platform is being used to formulate additional therapies based on hormones with pulsatile release patterns. The most advanced is a preparation of glucagon-like peptide-1, which has a profound effect on insulin levels without causing the toxicities caused by other formulations of this hormone. The drug may prove useful for type 2 diabetes and obesity. In addition, the Company has initiated studies of a melanoma/solid tumor therapy derived from a novel anti-cancer vaccine platform, and it has another program centered on the unfolded protein response pathway (heat shock proteins) that offers promise against hematological malignancies.

MANAGEMENT HAS MADE A COMMITMENT TO THE COMPANY'S SUCCESS. Few companies have had the support of their principal shareholder as Mannkind. Alfred Mann, who is perhaps best known for developing the first insulin pump, has invested more than \$900 million in the Company at prices well above the recent share price. Moreover, he has assembled an experienced management team that is capable of seeing Afresa through commercial launch and furthering the development of drugs in the R&D pipeline. The manufacturing plant, which is up and running, utilizes a modular production system designed to facilitate future expansion at the existing location and/or in other locales.

THIS STOCK IS UNDERVALUED. We believe Afresa will change the way diabetes is treated. Unlike Exubera[®] and other inhalable insulins that failed to reach the market, Mannkind's formulation has a pharmacokinetic profile that closely mimics intact pancreatic function, thereby providing as near-normal hormone replacement therapy as has ever been achieved for the postprandial period. As a result, Afresa is associated with significantly lower risk of hypoglycemia than current diabetes drugs, while protecting against the long-term complications of diabetes. Indeed, Afresa may even slow disease progression in early-stage insulin-dependent diabetics, since hyperglycemia, which occurs most often in the postprandial period, is known to be toxic to pancreatic β cells. Our valuation model is based on the commercialization of Afresa in developed countries only, without regard to its launch in less-developed nations and without consideration for other drugs in the R&D pipeline. Accordingly, these opportunities provide an upside potential not factored into the valuation. Nonetheless, our discounted cash flow model yields a per-share price of \$26. We are therefore initiating coverage of Mannkind Corporation (NasdaqGM: MNKD) with a BUY recommendation and a target price of \$26 per share.

TABLE OF CONTENTS

Management	4
Board of Directors	5
The Technosphere Platform	6
Mannkind's Inhalers	6
Afresa – A Better Insulin	7
Dosage Strengths	8
Clinical Trial Results	8
• Afresa mimics endogenous insulin release	8
• The incidence of hypoglycemia is lower with Afresa	9
• Afresa provides long-term glycemic control.....	11
• Afresa boasts a good safety profile	11
Predicting Acceptance of Afresa	12
Manufacturing Afresa	12
Competition to Afresa	13
Mannkind's R&D Pipeline	13
Patents	14
Investment Risks and Concerns	15
Financial Forecasts & Valuation	16
Revenue Sources	16
Income Statement	17
Balance Sheet	18
Cash Flow & Capitalization Table	19
Discounted Cash Flow Analysis	20
Disclosures	21

MANAGEMENT**Alfred E. Mann – Chairman and Chief Executive Officer**

- Has served as Chairman since 2001 and Chief Executive Officer since 2003.
- Founded and served as Chairman & CEO of MiniMed, the developer of the first microinfusion pump for delivering insulin to diabetic patients; founded and served as CEO of Pacesetter Systems, the developer of the pacemaker; founded and served as Chairman and co-CEO of Advanced Bionics, a developer of neurostimulation devices to treat hearing deficits and pain; and founded Second Sight, which is developing a visual prosthesis for the blind; Quallion, which produces batteries for medical devices and military/aerospace applications; and Stellar Microelectronics, a developer of batteries for medical, military, and aerospace use.
- Has received honorary doctorates from Johns Hopkins University, the University of Southern California, Western University, and Technion-Israel Institute of Technology. Is also a member of the National Academy of Engineering.

Hakan S. Edstrom – President and Chief Operating Officer

- Has served in his current capacities since April 2001 and has been a director of the Company since December 2001.
- Has more than 25 years of experience in various executive positions in the pharmaceutical and medical device industries with Bausch & Lomb and Pharmacia.

Matthew Pfeffer – Chief Financial Officer

- Has served in his current position since April 2008.
- Has extensive managerial experience in financial positions with VaxGen, Cell Genesys, and Price Waterhouse.

Jurgen Martens, PhD – Vice President of Operations and Chief Technology Officer

- Has served in his current capacity since September 2005.
- Has held managerial positions, largely related to plant and technology management, with Nektar Therapeutics, Aerojet Fine Chemicals, FMC Corporation, and Lonza.

Diane Palumbo – Vice President of Human Resources

- Joined Mannkind in November 2004
- Has held various positions in human resources with Amgen, Unisys, and Mitsui Bank Ltd.

Dr. Peter C. Richardson – Vice President and Chief Science Officer

- Has served in his current capacity since November 2005.
- Has more than 18 years of executive experience, largely with Novartis AG, and practiced as an endocrinologist.

David Thomson, PhD, JD – Corporate Vice President, General Counsel, and Corporate Secretary

- Joined Mannkind in January 2002.
- Has conducted neurophysiology research, practiced corporate law with a private law firm, and has experience in business development.

BOARD OF DIRECTORS**Alfred E. Mann – Chairman and Chief Executive Officer****Abraham E. Cohen**

- Director since May 2007.
- Served as Senior Vice President of Merck & Co. and as President of Merck Sharp & Dohme International Division.

Ronald Consiglio

- Director since October 2003.
- Managing director of Synergy Trading, a securities-trading partnership.

Hakan S. Edstrom – President and Chief Operating Officer**Michael Friedman, M.D.**

- Director since December 2003.
- Serves as the President and Chief Executive Officer of the City of Hope National Medical Center.

Kent Kresa

- Director since June 2004.
- Is the Chairman Emeritus of Northrop Group Corporation.

David H. MacCallum

- Director since June 2004.
- Is the Managing Partner of Outer Islands Capital, a hedge fund specializing in health care investments.

Henry L. Nordhoff

- Director since March 2005.
- Is the Chief Executive Officer and President of Gen-Probe, Inc., a clinical diagnostic and blood screening company.

THE TECHNOSPHERE PLATFORM – BROAD POTENTIAL APPLICATIONS

Mankind's drug delivery technology is a microparticle that self-assembles from complexes that are insoluble and stable in acidic environments but become unstable in the normal physiological pH range. The key chemical is fumaryl-diketopiperazine, which complexes well with a wide variety of compounds, including peptides, proteins, oligo and polysaccharides, nucleic acids, and combinations of these compounds.¹ The Technosphere microparticles stabilize associated compounds and augment their transport across cell membranes at a fairly wide pH range, including the alkaline environment of the intestines. (The only pH range in which the microspheres do not facilitate transport is in the pH 4-5 range.) Moreover, the microparticles can be assembled in sizes small enough for pulmonary delivery (i.e., 2-3 microns) or coated for release within specific portions of the gastrointestinal tract. The Technosphere particles are also readily cleared by the body, thereby ensuring that they do not accumulate or interfere with normal tissue function.

Mankind has tested its platform technology with such compounds as insulin, parathyroid hormone, calcitonin, human growth hormone, and glucagon-like peptides. Normal physiological release of these occurs in a pulsatile manner, one that can be addressed with Mankind's delivery platform. Thus, the Company is in a position to formulate medicines to closely match circadian rhythms governing endogenous hormone patterns and thereby secure a leading position in the emerging field of chronopharmacology.

MANKIND'S INHALERS – SMALL & EFFICIENT

The Company has designed several inhalers to use with Technosphere-formulated drugs. This is important for gaining consumer acceptance, as evidenced by patients' reluctance to use Pfizer's inhalable insulin, Exubera. Mankind's inhalers, which are shown in Figure 1, enable users to dose themselves discretely, even in public. This contrasts with patients' experience with Exubera, which was very inconvenient to carry and anything but inconspicuous to use.



The first inhaler, depicted on the left in Figure 1, is the version used in clinical trials of Mankind's inhalable insulin. As such, it is an integral part of the NDA filed on the drug. An improved model, called the Dreamboat, and the drug cartridge are shown in the center panel. It is both smaller than the original model and 33% more efficient in delivering Technosphere Insulin into the deep lungs. As discussed below, higher dosage strengths will be offered with this device. The picture on the far right in Figure 1 is a display of even newer inhalers that will use color and shape to distinguish between different drugs and different dosage strengths.

¹ Gerber, C and Rousseau, K. Cell transport compositions and uses thereof. U.S. patent application publication number: US2004/0038865.

AFRESA – A BETTER INSULIN

Mannkind has used its Technosphere platform to create an inhalable formulation of human insulin, called Afresa, for type 1 and type 2 diabetes. (For a review of diabetes, see the blue box below.) The Company filed for FDA approval for the use of Afresa by adults on March 16th, but work is under way to gain regulatory approval for children as well. The drug has been tested in more than 5,300 patients in numerous clinical trials, some lasting four years. The data has established Afresa's efficacy in controlling glucose levels in type 1 and type 2 diabetic patients, while differentiating the drug from other preparations of insulin and insulin analogs. The results also demonstrated a very favorable safety profile with respect to lung function and general metabolism.

Diabetes is a condition characterized by inadequate glucose control, resulting in periods of excess glucose (hyperglycemia) and inadequate glucose (hypoglycemia). Normally, glucose levels are maintained by the liver between meals and by glucose uptake by various tissues immediately after eating. Both processes are controlled by insulin secreted from β cells in the islets of Langerhans of the pancreas. Type 1 diabetes is an autoimmune disease in which the β cells are attacked by the immune system. Striking during childhood, it accounts for about 5% of the diabetes population. Type 2 diabetes is the most prevalent form of the disease (about 90% of the diabetic population) and has been associated with aging, although lately incidence rates have risen dramatically among individuals less than 20 years of age, in parallel with the prevalence of obesity. Type 2 diabetes has been associated with insulin resistance during the early stages of the disease in which the body's tissues fail to respond normally to insulin. Over time, hyperglycemic episodes, which are toxic to the pancreatic β cells, eventually take their toll. A third type of diabetes, associated with pregnancy, is termed gestational diabetes, and like type 1 diabetes, it accounts for about 5% of the diabetes population.

Diabetes is typically diagnosed by fasting glucose levels in the blood and an oral glucose tolerance test, but an alternative is measurement of glycosylated hemoglobin (HbA_{1c}), which provides a long-term assessment of glycemic control. Overall, 23.6 million individuals were estimated to be diabetic in the United States in 2007 and another 57 million had impaired fasting glucose, indicating prediabetes.² However, of the diabetic individuals, only 17.9 million were diagnosed. The diabetic population is projected to grow faster than the overall population to 2030, driven by an aging of the baby boom generation and an increase in the prevalence of obesity.

One objective of insulin replacement therapy is to reduce HbA_{1c} levels below 7%. According to the Centers for Disease Control and Prevention, 27% of adult diabetics rely on insulin therapy alone or in combination with oral medications, while 57% require only oral medicines and 16% take no medications.² The latest trend in diabetes care involves a progression from simple changes in life style to use of metformin and then insulin. Earlier use of insulin reflects a realization that the hormone constitutes the best means of controlling glucose. It is possible that tighter glucose control by early-stage type 2 patients will prevent or at least slow the progression from insulin resistance to insulin dependence.³ Intensive glucose control over prolonged periods has been showed to halve the complications that often accompany type 1 diabetes, including cardiovascular disorders, renal failure, and neuropathies.⁴ Unfortunately, many diabetic subjects are reluctant to self-administer insulin. Any insulin formulation that improves glucose control and/or increases patient compliance would therefore preserve their quality of life and reduce the financial burden that the disease inflicts. The direct healthcare costs for diabetes in the United States alone were estimated to total \$116 billion in 2007.² Given the aforementioned trend in disease prevalence, costs will only rise in the coming few decades unless better therapies become available.

² National Diabetes Fact Sheet, 2007. Published by the Centers for Disease Control and Prevention.

³ Wajchenberg, BL. β -cell failure in diabetes and preservation by clinical treatment. *Endocrin Rev* 2007; 28(2): 187.

⁴ Nathan, DM, et al. Modern-day clinical course of type 1 diabetes mellitus after 30 year's duration. *Arch Intern Med* 2009; 169(14): 1307.

DOSAGE STRENGTHS

The initial dosage strengths of human insulin that Mannkind developed are equivalent to 4 and 8 units of regular, subcutaneously administered insulin. These were investigated with the first-generation MedTone inhaler, pictured in Figure 1. However, the Dreamboat inhaler, which will soon enter a bioequivalence study, will probably be the commercialized delivery system. It will support a broader range of doses, with the addition of 12 and 16 unit equivalent cartridges that will be offered subsequent to Afresa's launch. (To achieve these subcutaneous-equivalent doses, the Dreamboat inhaler will be loaded with 10, 20, 30 and 40 units of human insulin. The higher doses will be achieved partly by increasing the insulin loaded onto the Technosphere microparticle and partly by increasing the amount of powder in the inhaler.) This range should render Afresa convenient for most diabetic patients. Mannkind plans to provide an inhaler with every few weeks worth of insulin.

CLINICAL TRIAL RESULTS

Afresa mimics endogenous insulin release.⁵ (See Figure 2.) One factor determining its pharmacokinetic profile is that the Technosphere technology is complexed with natural, monomeric insulin, rather than the zinc-stabilized hexameric form used in all insulin preparations available today. As a result, Mannkind's microparticles release insulin in a form that can be used immediately by the body. This trait, plus the availability of the large surface area provided for absorption (70 m² of alveolar surface), results in its fast uptake into the blood stream and ready bioavailability.⁶ Maximum levels are reached in 12 to 14 minutes after inhalation, with about 40% of the dose reaching the deep lung. Taking into account local degradation and mucociliary clearance, less than 1% of the insulin and the fumaryl-diketopiperazine administered remain in the lung 4 hours after administration.

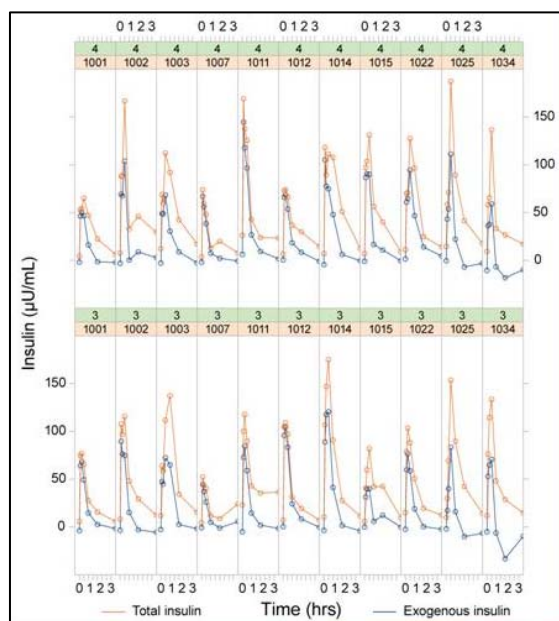


Figure 2. Changes in total (orange) and exogenous (blue) insulin are plotted after administration of Afresa and consumption of a standardized meal by 11 healthy volunteers. Note the strong temporal correlation between the initial appearance of exogenous insulin and total insulin levels. The difference between the total and exogenous insulin levels is endogenous insulin released by the pancreas, as measured indirectly by quantitation of a co-released peptide, C-peptide.

Afresa's ability to mimic endogenous insulin release protects against hyperglycemia that often occurs with other insulins upon consumption of a meal, and it reduces the demands placed upon the pancreatic β cells that are still functioning in early-stage type 2 diabetic subjects.

Source: Marino, MT, et al.⁵

The key characteristics of Afresa's delivery profile are its rapid uptake, the maximum circulating insulin level achieved, and the rapid return to near baseline, as depicted by the blue lines in Figure 2. Quickly attaining maximal levels is important since it is this early signal from the pancreas that is believed to shut down glucose production in the liver of non-diabetic individuals, thereby conserving this source of energy

⁵ Marino, MT, et al. C-peptide correction method to determine exogenous insulin levels in PK studies using Afresa (Technosphere Insulin). Presented at the American Diabetes Association meeting, June 2009.

⁶ Gottfried, M et al. Lung deposition and absorption of insulin from Technosphere Insulin. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

and helping to prevent hyperglycemia as nutrients are absorbed following food consumption. The rapid decline in insulin after the maximal levels are achieved also merits consideration, because the return toward baseline helps to prevent hypoglycemia as glucose absorption from the gut begins to decline.

Afresa provides superior postprandial glucose control. As presented in Figure 3A, less time is required for insulin to reach maximum levels with Afresa than with a rapid-acting analog, lispro (Lilly's Humalog®) or with another inhaled insulin, Pfizer's Exubera®.⁷ Also, insulin levels decline much more rapidly with Afresa than with the other two drugs. These differences translate into distinct profiles of postprandial, endogenous insulin secretion and glucose levels in the blood, as shown in Figures 3B and 3C. Afresa slows the rise in glucose, thereby postponing achievement of the maximum level until about 3 hours after the start of the meal, and it delays the decline, thus giving the body ample time to utilize this energy source.

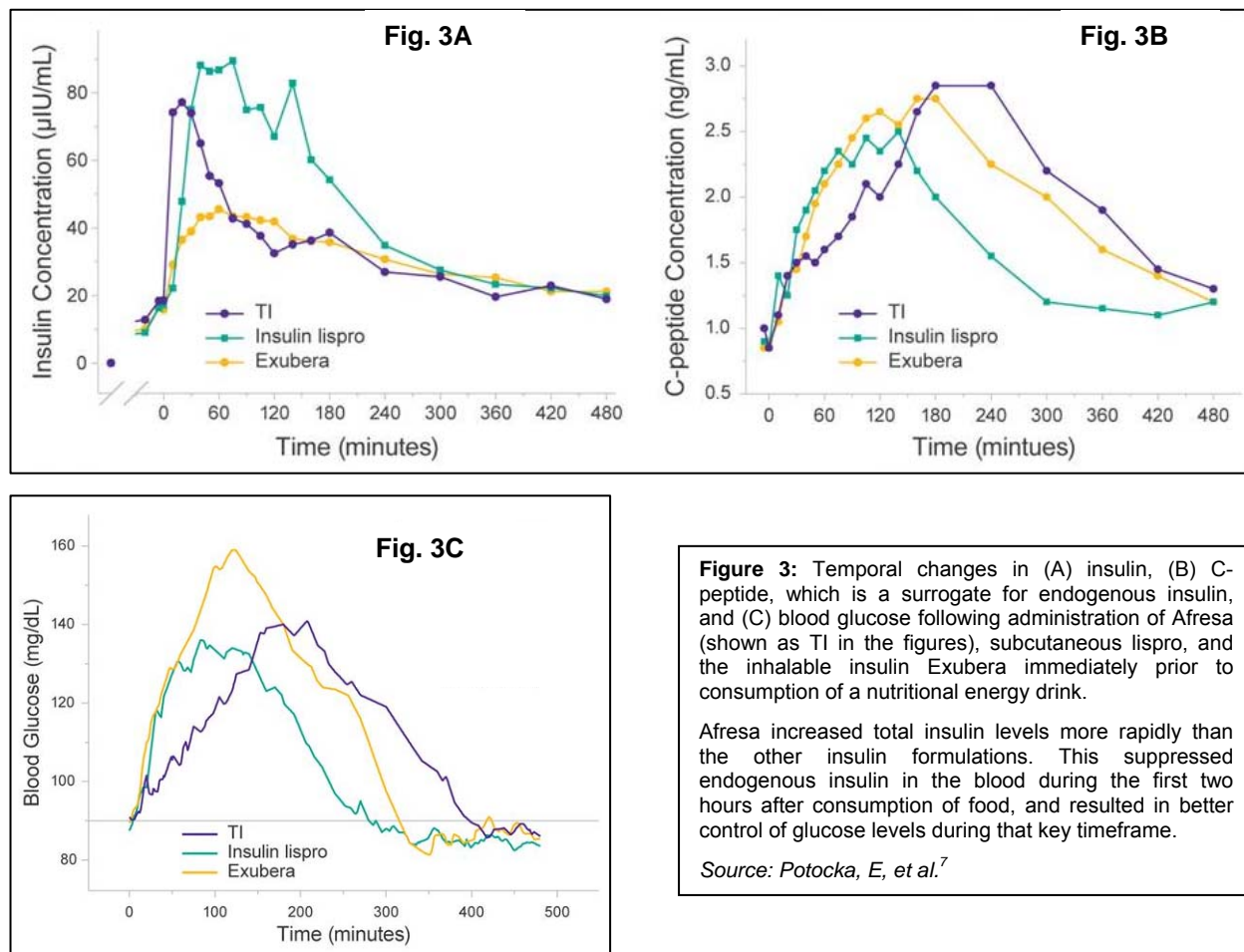


Figure 3: Temporal changes in (A) insulin, (B) C-peptide, which is a surrogate for endogenous insulin, and (C) blood glucose following administration of Afresa (shown as TI in the figures), subcutaneous lispro, and the inhalable insulin Exubera immediately prior to consumption of a nutritional energy drink.

Afresa increased total insulin levels more rapidly than the other insulin formulations. This suppressed endogenous insulin in the blood during the first two hours after consumption of food, and resulted in better control of glucose levels during that key timeframe.

Source: Potocka, E, et al.⁷

The differences in the pharmacokinetic patterns of these insulins and the related changes in postprandial glucose probably account for clinical improvements seen with Afresa. For instance, long-term use of Afresa is associated with a decline in fasting glucose levels, which suggests a change in insulin resistance.

The incidence of hypoglycemia is lower with Afresa. An important concern for diabetic patients is hypoglycemia, because severe cases require emergency medical attention and are known to be

⁷ Potocka, E, et al. Technosphere Insulin suppresses endogenous glucose production earlier than a rapid-acting analog (lispro) and an inhaled insulin (Exubera). Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

associated with dementia and a significant increase in mortality.^{8,9} Mannkind has investigated the incidence of hypoglycemia and found that type 1 diabetic subjects experienced fewer episodes of mild/moderate, severe, and total hypoglycemia with Afresa than with a rapid-acting insulin analog in a 52-week study.¹⁰

An analysis of pooled data from Phase 2 and 3 clinical trials involving type 2 diabetic subjects came to a similar conclusion.¹¹ The 1,795 subjects, who had been diagnosed 10-12 years prior to the trial, experienced significantly fewer and less severe hypoglycemic episodes with Afresa than the 942 subjects treated with subcutaneous insulins. The data, which is summarized in Table 1, indicate that Afresa is associated with 40% fewer hypoglycemic episodes and 52% fewer severe episodes (both expressed on an event rate per 100 subject months). In addition, the study found that the incidence of cognitive neurological symptoms associated with hypoglycemic events declined by 59% (not presented in Table 1).

Table 1. Incidence of Hypoglycemia in Type 2 Diabetic Subjects with Afresa (TI) and SC Insulin.

Hypoglycemia	Incidence (%)		Odds Ratio	Odds Ratio p Value	Event Rate per 100 Subject Months		Event Rate p Value
	TI	SC Insulin			TI	SC Insulin	
Mild/Moderate	31.6	49.4	0.466	<0.0001	23.2	37.3	<0.0001
Severe	2.8	7.5	0.359	<0.0001	0.66	1.37	0.0184
Total	31.8	49.6	0.466	<0.0001	23.9	38.8	<0.0001

Source: Lorber et al.¹¹

These results are consistent with hypoglycemia rates of 0.31 – 0.42 events per subject-month with Afresa in a single study of patients taking the drug for up to 4 years.¹² The lower incidence of hypoglycemia with Afresa is also apparent, regardless of HbA_{1c} levels, as depicted in Figure 4.

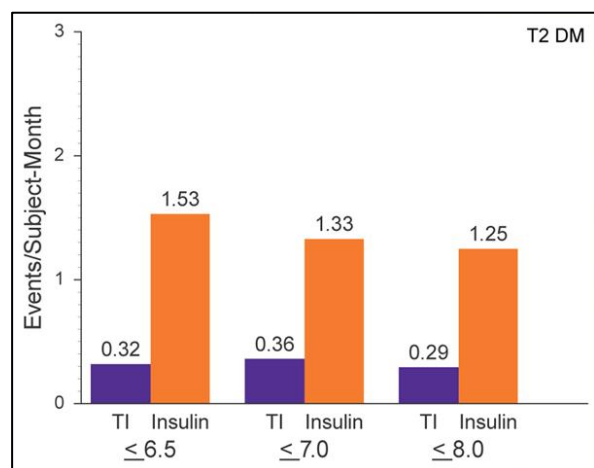


Figure 4. Incidence of hypoglycemic events segregated by end-of-trial HbA_{1c} levels and therapy, based on pooled data from ITT trials involving type 2 diabetic subjects. (TI refers to Technosphere Insulin, Afresa.)

Source: Lorber et al.¹¹

⁸ Whitmer, RA, et al. Hypoglycemic episodes and risk of dementia in older patients with type 2 diabetes mellitus. JAMA 2009; 301(15): 1565.

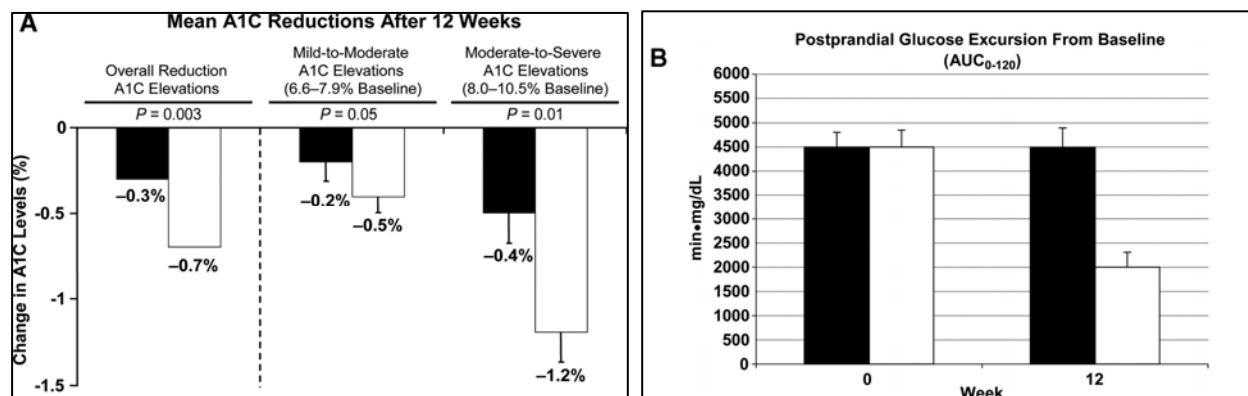
⁹ Turchin, A, et al. Hypoglycemia and clinical outcomes in patients with diabetes hospitalized in the general ward. Diabetes Care 2009; 32(7): 1153.

¹⁰ Kapsner, P, et al. Comparative efficacy and safety of Technosphere Insulin and a rapid-acting analog both given with glargine in subjects with T1 DM in a 52-week study. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

¹¹ Lorber, D, Reduced incidence and frequency of hypoglycemia in an integrated analysis of pooled data from clinical trials of subjects with type 2 diabetes using prandial inhaled Technosphere Insulin. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

¹² Amin, N, et al. Long-term sustained safety and efficacy of continued use of Technosphere insulin in subjects with type 2 diabetes. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

Afresa provides long-term glycemic control. A 12-week study of Afresa with type 2 patients whose glucose levels were not optimally controlled with oral antidiabetic agents revealed that inhaled insulin reduced HbA_{1c} and the postprandial glucose excursion from baseline.¹³ (See Figures 5A & B.) The data also suggest that Afresa offers the greatest benefit (as determined by HbA_{1c} lowering) to patients exhibiting the worst baseline glucose control (as indicated by higher initial, or baseline HbA_{1c} levels).



Figures 5A and 5B. Change in HbA_{1c} and postprandial glucose excursions from baseline after 12 weeks of Afresa therapy (□) or Technosphere particle placebo (■). (A) Results are presented based on baseline HbA_{1c} levels: overall after 2 weeks of therapy, and mild-to-moderate and moderate-to-severe patients after 12 weeks of treatment. (B) Area under the curve for blood glucose during the first two hours after a meal.

The results demonstrate that 12 weeks of Afresa therapy has a greater effect on HbA_{1c} levels in patients whose baseline levels were highest, and it lowered total glucose in circulation during the first two hours following a meal (as measured by area under the curve).

Source: Rosenstock, J, et al.¹³

Long-term studies of Afresa in type 1 and type 2 diabetic patients demonstrated further that it provides the same level of control as the standard therapies employed today.^{10,12}

Afresa boasts a good safety profile. The drug has shown no carcinogenicity or tumor-growth promoting properties during two years of use. It also has no effect on pulmonary function, as measured by forced expiratory volume and diffusion capacity, or on lung structure, as assessed with computed tomography after 2 or 3 years of use.^{14,15} What's more, the drug's pharmacokinetic profile is not altered by conditions that might impede normal lung function, such as chronic obstructive pulmonary disease.¹⁶ This means that the drug should still be effective in patients who develop temporary pulmonary disorders. (Note that Mannkind is not seeking FDA approval of Afresa for use by patients who smoke or have chronic lung diseases.) It should also be noted that a minor cough was the only adverse event noted in excess of those seen in the comparator population.

¹³ Rosenstock, J, et al. Efficacy and safety of Technosphere inhaled insulin compared with Technosphere powder placebo in insulin-naïve type 2 diabetes suboptimally controlled with oral agents. *Diabetes Care* 2008; 31(11): 2177.

¹⁴ Phillips, M, et al. Pulmonary functions (over 2 years) in diabetic subjects treated with Technosphere Insulin or usual antidiabetic treatment. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

¹⁵ Rossiter, A, et al. Pulmonary safety of inhaled Technosphere Insulin therapy in adults with diabetes using high-resolution computerized tomography of the chest. Presented at the European Association for the Study of Diabetes meeting, September/October 2009.

¹⁶ Potocka, E, et al. Pharmacokinetics of Afresa unchanged in patients with chronic obstructive pulmonary disease. Presented at the American Diabetes Association meeting, June 2009.

PREDICTING ACCEPTANCE OF AFRESA

We believe four factors augur well for Afresa's acceptance:

- **Afresa is easy to use.** Normal inspiratory effort is all that's required to draw Technosphere Insulin into the deep lung, and doses are interchangeable, meaning that multiple doses may be used to achieve a targeted level in circulation.¹⁷ As a result, patients are able to achieve more reproducible dosing with Afresa than with subcutaneous insulin. (Another reason is that subcutaneous insulin absorption is affected by factors that alter blood flow near the injection site, including the location of the injection, the subject's cardiovascular status and physical activity, and ambient temperature.)
- **Physicians' preference surveys found favorable impressions of the drug,** based on clinical data that has been accumulated to date. The latest survey, of U.S. physicians, found that 25% of endocrinologists and primary care physicians expressed a preference for Afresa for both their type 1 and type 2 diabetic patients.¹⁸ Similar results were obtained when physicians in Europe were asked if they would prescribe Afresa to their patients.
- **Consumer preference studies favor Afresa.** About 10% of the population is needle-phobic, while an even larger proportion simply has an aversion to insulin therapy in general. The latter group's reluctance is based on concern for developing hypoglycemia (significantly less common with Afresa), weight gain that often accompanies insulin therapy (but not with Afresa¹⁹), and the inconvenience of an insulin regimen (greatly simplified by Mannkind's small inhalers). More specific to Afresa, Mannkind's clinical trials included patient-reported outcomes that showed significant improvements in attitudes toward insulin therapy and Afresa in particular, as well as a better health-related quality of life and treatment satisfaction by patients taking Afresa, versus those who used metformin and a secretagogue.^{19,20}
- **Securing reimbursement is well under way.** Mannkind has had discussions with insurers accounting for about 30% of U.S. lives and has been assured that Afresa will be placed in Tier 2 within six months of launch, which means that copays will approximate \$20 – \$25 per prescription at that time. (Prior to that point, high copays may restrain Afresa's market penetration.) Based on reimbursement rates that were granted Exubera by various nations in Europe, Afresa will probably be launched in Spain and the United Kingdom first. These nations provided Exubera with the best rates and the least restrictions. We believe the Company will be able to secure decent pricing by asserting such ancillary benefits with Afresa as improved patient compliance and a lower incidence of hypoglycemia.

MANUFACTURING AFRESA

Mannkind intends to supply Afresa to its marketing partner(s). Accordingly, the Company purchased a facility in Danbury, Connecticut in 2001, expanded it from 190,000 square feet to 328,000 square feet, and set up a production line to support the drug's commercialization. The plant, which officially opened in September 2008, received ISO certification last year and is ready for an FDA inspection. Mannkind does not manufacture insulin or the key ingredient in its Technosphere technology, but sources them from third parties. Indeed, the Company purchased sufficient insulin for \$10 billion worth of Afresa (in end-user dollars) from a German plant owned by Pfizer in June, got an option to buy another \$9 billion worth, and

¹⁷ Cassidy, JP, et al. Afresa (Technosphere Insulin) dosage strengths are interchangeable. Presented at the American Diabetes Association meeting, June 2009.

¹⁸ Mannkind press release, MannKind Announces Positive New Market Survey Information Regarding AFRESA(R), dated July 14, 2009.

¹⁹ Rubin, RR and Peyrot, M. Patient reported outcomes in adults with type 1 diabetes using mealtime Afresa (inhaled Technosphere Insulin) or rapid acting insulin with basal insulin. Presented at the American Diabetes Association meeting, June 2009.

²⁰ Peyrot, M and Rubin, RR. Patient reported outcomes in adults with type 2 diabetes using mealtime Afresa (inhaled Technosphere Insulin) or metformin + secretagogue or both. Presented at the American Diabetes Association meeting, June 2009.

obtained the blueprints for the plant and the cell culture used to produce the insulin.²¹ The deal ensures Mankind will have an ample supply of insulin. As for the Company's own production capacity for Afresa, Jurgen Martin, the Vice President of Operations and Chief Technical Officer, estimates that it will take less than 2¹/₂ years to add a second manufacturing site and much less time to set up additional production lines in Danbury.²²

COMPETITION TO AFRESA

Upon entering the market, Afresa will pose a competitive threat to existing rapid-acting insulin analogs, Lilly's Humalog and NovoNordisk's Novolog[®], and secretagogues, such as nateglinide (Novartis's Starlix[®]) and glipizide (Pfizer's Glucotrol[®]). Hence, it will be important for Mankind to have the marketing support of a partner capable of detailing the drug to general practitioners, while the Company's specialty sales force will call upon endocrinologists. (Mankind may establish its sales force subsequent to launch.)

New formulations of insulin may pose a threat to Afresa in time. We note that Biocon is developing an intranasally delivered formulation, IN-105, that is in advanced clinical testing in India,²³ Generex has an insulin spray (Oral-lyn[®]) for oral/buccal delivery that is in a Phase 3 clinical trial, and CPEX is working on an intranasally delivered formulation that is in two Phase 2 trials.²⁴ Another source of competition may come from stem cell research, since attempts have been made over the past two decades to develop implants capable of replacing pancreatic β cells.²⁵ Alternatively, some stem cells have exhibited immunomodulatory properties that may prove useful for early-stage diabetic subjects.²⁶

MANKIND'S R&D PIPELINE

The Company's top priority has been to complete development of Afresa, but it has also conducted research to expand the use of its proprietary Technosphere technology and to diversify its drug portfolio into oncology:

- **Afresa:** Two important clinical trials involving Afresa are planned for the near future. One will be a simple bioequivalence study to demonstrate that the Dreamboat inhaler delivers the drug in a manner that is comparable to that achieved with the MedTone inhaler. The company is awaiting approval of the trial's design by the FDA, and it is likely that the Dreamboat inhaler will be approved prior to Afresa's commercial launch. The other study is a Phase 4 trial that will demonstrate Afresa's ability to lower HbA_{1c} under optimal conditions. (The clinical studies to date have been conducted to compare Afresa with today's best therapies under pre-defined conditions, and as such, the drug's maximal effect on long-term glucose control was not optimized for each patient.)
- **New Technosphere formulations:** Mankind has already prepared Technosphere formulations of three hormones released from the gastrointestinal tract that play a role in regulating food consumption and/or glucose metabolism. All three, glucagon-like peptide-1 (GLP-1), peptide-Y, and oxyntomodulin, were readily absorbed from the lungs. Preclinical studies of peptide-Y and oxyntomodulin demonstrated their ability to significantly reduce food consumption, while the GLP-1 altered insulin levels and lowered food consumption.²⁷ Mankind has taken its GLP-1 formulation, dubbed MKC-253, into the clinic as a possible therapy for diabetes associated with obesity. The drug produced a rapid spike in insulin less than 10 minutes after administration, but did not cause the nausea seen with other companies' GLP-1 preparations, perhaps because it

²¹ Al Mann presentation at the UBS Life Science Conference, September 22, 2009.

²² Personal communication, August 2009.

²³ Information obtained from www.biocon.com website in early October 2009.

²⁴ Generex and CPEX clinical status obtained from www.clinicaltrials.gov in early October 2009.

²⁵ Liew, CG and Andrews, PW. Stem cell therapy to treat diabetes mellitus. *Rev Diabet Stud* 2008; 5(4): 203.

²⁶ Nauta, AJ, and Febbe, WE. Immunomodulatory properties of mesenchymal stromal cells. *Blood* (2007); 110(10): 3499.

²⁷ Leone-Bay, A. Mimicking endogenous peptide secretion by inhalation. Presented at the American Peptide Symposium, June 2009.

had no effect on gastric emptying.^{28,29} These effects were distinct from those of exenatide, a GLP-1 mimetic sold by Amlyn Pharmaceuticals and Eli Lilly as Byetta[®], which does slow gastric emptying, but produces a slower and smaller rise in circulating insulin levels. MKC-253 therapy may have an added value that was not apparent from the trials conducted so far; chronic exposure to GLP-1 in preclinical models stimulates β -cell proliferation and inhibits β -cell apoptosis.³

- **Oncology pipeline:** Mannkind has created a platform technology for the development of cancer immunotherapies that involves stimulation of the patient's immune system with a plasmid carrying the DNA for a tumor-associated antigen, followed by administration of a peptide resembling the antigen to amplify the immune response. The Company has taken two of these therapies (MKC-1106 MP and PP) into Phase 1 clinical trials, involving patients with advanced metastatic melanoma or with refractory solid tumors. The latter trial demonstrated that the therapy, which involved peptide epitopes of a PRAME (preferentially expressed antigen of melanoma) and PSMA (prostate specific membrane antigen), elicited an immune response in 60% of the patients treated, resulting in a clinical response in 33% (1 melanoma, 6 prostate, and 2 renal). The data confirmed the validity of this therapeutic approach and determined that it is well tolerated.

A separate oncology program is centered on the unfolded protein response pathway in which the enzyme inositol-requiring enzyme 1 α initiates the induction of molecular chaperones to support the proper folding of secreted and membrane proteins. By inhibiting this enzyme, cells should not be able to form membrane components needed for their own integrity and for division. This preclinical research program is being funded in part by the Leukemia and Lymphoma Society.

PATENTS

Mannkind has extensive patent protection covering its Technosphere technology, Afresa, and oncology therapies. Overall, 35 patents were granted and more than 200 were pending on the Technosphere platform according to the 10K filed for the year ended December 31, 2008. However, the Company is continuing to file claims that may extend protection well beyond the initial patent expiry dates of 2020 for Afresa and 2023 for the MedTone inhaler. In addition, Mannkind owns 16 patents related to its oncology program and has another 180 applications pending in the United States and abroad, according to the 2008 10K.

²⁸ Costello, D, et al. PK/PD modeling of MKC-253 (inhaled GLP-1) and exenatide on insulin, C-peptide, glucagon, glucose, and gastric emptying. Presented at the American Diabetes Association meeting, June 2009.

²⁹ Baughman, RA, et al. Inhaled GLP-1 and exenatide: Different effects on pancreatic and gastric activity. Presented at the American Diabetes Association meeting, June 2009.

INVESTMENT RISKS AND CONCERNS

For a complete description of risks and uncertainties related to Mannkind's business, see the "Risk Factors" section in Mannkind's SEC filings, which can be accessed directly from the SEC Edgar filings at www.sec.gov. Potential risks include:

- ❑ **Stock risk and market risk:** There can be no assurance that an active and liquid trading will be sustained in Mannkind's stock, which could limit one's ability to buy or sell the Company's common stock at a desired price. Investors should also consider technical risks common to stock investments, such as float, risk of dilution, dependence upon key personnel, and the strength of competitors that may be larger and better capitalized.
- ❑ **New and rapidly changing field:** The pharmaceutical and biotechnology markets are rapidly evolving, and research and development are expected to continue at a rapid pace. Other companies are actively engaged in the development of therapies to directly or indirectly treat those disorders being pursued by Mannkind. These companies may have substantially greater research and development capabilities, as well as significantly greater marketing, financial, and human resources than Mannkind.
- ❑ **Products still in development phases:** Although the Company is preparing to commercialize its inhalable insulin, Afresa, it intends to continue to develop drugs with its Technosphere technology and to invest further in its oncology program. Successful commercialization of Afresa and development of other products is uncertain. Drug development costs and timelines can vary significantly for each product candidate and are difficult to accurately predict. In addition, products in development that appear to be promising may not reach commercialization for various reasons, including failure to achieve regulatory approvals, safety concerns, and/or the inability to be manufactured at a reasonable cost. And even once a drug has been commercialized, there is no assurance that it will be accepted by consumers or the medical community.
- ❑ **Funding requirements:** It is difficult to predict the Company's future capital requirements. Mannkind may need additional financing to continue funding the research and development of its products and to expand its business. There is no guarantee that it can secure the desired future capital or, if sufficient capital is secured, that current shareholders will not suffer significant dilution.
- ❑ **Regulatory risk:** Various statutes and regulations govern or influence the manufacturing, safety, labeling, storage, recordkeeping and marketing of each product. The lengthy process of seeking approval and the subsequent compliance with applicable statutes and regulations require the expenditure of substantial resources. Any failure to obtain, or any delay in obtaining, regulatory approvals could materially adversely affect Mannkind's business. There is no guarantee that the Company's products will be approved by the U.S. Food and Drug Administration (FDA) or international regulatory bodies for marketing in the U.S. or abroad.
- ❑ **Competitive risk:** The pharmaceutical industry is extremely competitive, mainly due to its large market potential. Many companies are developing products for the same therapeutic indications targeted by Mannkind. These companies may have substantially more resources than Mannkind and any potential partners, which could adversely affect the Company's position in the market place.

FINANCIAL FORECASTS & VALUATION

Our financial analysis is based on commercial prospects for Afresa in developed countries only, and as such, other countries and products in the R&D pipeline provide upside potential to this valuation. Also, we have used single royalty rates in our analysis for the United States and overseas markets, though we believe different alternatives have been discussed with potential partners. We will update our model once the final details of the partnering agreement(s) are known.

REVENUE SOURCES

AFRESA - United States			
Year penetration starts	2010	Prevalence	24,800,000
Starting penetration rate	0.5%	Percent addressable	21%
Years between penetration start and peak	7	Market growth rate	2.5%
Peak penetration	30%	Price per patient	\$1,975
Duration of peak penetration in years	6	Treatment price growth	1%
Retention rate in decline years	90%	Royalty rate	30%
Stage of development	NDA filed	Probability of commercialization	80%

AFRESA - Foreign			
Year penetration starts	2011	Prevalence	38,270,000
Starting penetration rate	1.0%	Percent addressable	21%
Years between penetration start and peak	8	Market growth rate	2.5%
Peak penetration	30%	Price per patient	\$1,200
Duration of peak penetration in years	4	Treatment price growth	1%
Retention rate in decline years	90%	Royalty rate	25%
Stage of development	Phase III	Probability of commercialization	80%

Assumptions regarding revenue sources:

- Afresa enters the United States in the second half of 2010 and other developed countries starting in 2011.
- The addressable U.S. market consists of the 24.8 million people who are considered diabetic by the American Diabetes Association, have been diagnosed (76% of the diabetic population), and require insulin therapy (approximately 27% of the diabetic population). The size of the foreign market was obtained from the World Health Organization for developed countries, less the U.S. diabetic population. Both markets are estimated to be growing at an annual rate of 2.0%-2.5%, faster than the overall population, since type 2 diabetes typically affects the over-60 age group.³⁰
- The drug is priced at a 5% premium to Humalog pen in the United States. The average price abroad is about 60% of the domestic price.
- The domestic penetration rate is 0.5% initially, given the drug's availability for less than a full year. The rate is about 1% in its first year overseas, reflecting broader recognition of Afresa's therapeutic value since it will have been on the U.S. market for a while, offset partially by the need to secure regulatory approvals and reimbursement coverage in multiple countries.
- Afresa's maximum market penetration is 30% in both the United States and abroad, aided by its unique formulation, but restrained by premium pricing.

³⁰ Mainous, AG, et al. Impact of the population at risk of diabetes on projections of diabetes burden in the United States: an epidemic on the way. Diabetologia 2007; 50: 934.

- Patents and exclusivity provisions protect Afresa from generic competition through most our 15-year valuation period.
- Until the terms of a licensing agreement are better known, we're basing our the valuation model on two assumptions (1) that Mannkind co-markets Afresa domestically and records 15% of sales as its own and (2) that the Company books royalties at 30% of its partner's sales in the United States and at a rate of 25% overseas. (Note that these are blended rates, which encompass both a straight royalty on partner(s)' sales and profits from supplying Afresa.)
- The probability of commercialization is 80%, given the volume of data amassed in support of Afresa's approval by regulators worldwide.

INCOME STATEMENT[#] (Fiscal year ends on December 31st.)

All figures are in thousands, except per-share data.

	2009	2010	2011	2012	2013
Total revenue	\$ -	\$ 40,861	\$ 258,627	\$ 548,949	\$ 859,456
COGS	-	1,545	15,084	29,574	45,068
Gross profit	\$ -	\$ 39,316	\$ 243,543	\$ 519,375	\$ 814,388
Operating expenses					
R&D	\$ 160,000	\$ 80,000	\$ 90,000	\$ 110,000	\$ 154,702
Selling & marketing	15,000	40,000	60,000	93,321	146,107
General & administrative	65,000	35,000	40,000	50,000	60,162
Total expense	240,000	155,000	190,000	253,321	360,971
Operating profit	\$ (240,000)	\$ (115,684)	\$ 53,543	\$ 266,054	\$ 453,416
Non-operating income/expense					
Interest expense	8500	8500	8500	4300	
Interest income	500	500	500	500	1000
Other					
Total non-operating	9,000	9,000	9,000	4,800	1,000
Pretax profit	\$ (231,000)	\$ (106,684)	\$ 62,543	\$ 270,854	\$ 454,416
Income tax			12,509	102,924	172,678
Net income	\$ (231,000)	\$ (106,684)	\$ 50,034	\$ 167,929	\$ 281,738
Earnings (loss) per share	\$ (2.04)	\$ (0.94)	\$ 0.37	\$ 1.24	\$ 2.09
Diluted shares outstanding	130000	133000	134000	135000	135000
Basic Shares	113000	114000	119000	125000	133000

Assumptions regarding the Income Statement:

- Mannkind accounts for 15% of domestic sales and books royalties at a 30% rate on its partner(s)' U.S. sales and 25% of foreign sales.
- The Company receives an upfront licensing fee of \$100 million in 2010 and a \$50 million milestone upon receipt of European approval, but both are recognized over 5 years for accounting purposes.
- The gross margin on Afresa is 80%.
- R&D costs fall between 2009 and 2010, as Afresa trials are completed. Thereafter, they rise as other drugs advance in the pipeline. By 2013, R&D expenses stabilize at 19% of revenue.

- Selling & marketing costs are first booked in 2009 as preparations are made to support the launch of Afresa. In 2010 and 2011, the Company spends \$40-\$60 million annually on promotional support. Thereafter, we've assumed that 17% of revenue is dedicated to selling & marketing endeavors.
- Annual general and administrative expenses total \$65 million in 2009, and decline markedly in 2010 with lower consulting fees and other costs. Thereafter, these expenditures rise as the corporate infrastructure expands, stabilizing at 7% of revenue starting in 2013.
- The Company repays funds borrowed from its principal stockholder in 2012, and a year later its convertible debt, which amounted to \$112 million as of December 31, 2008, is converted to equity.
- Income taxes are booked for financial reporting purposes at a 20% rate in 2011. Thereafter, the Company books tax liabilities at a 38% rate. However, net operating loss carryforwards, which totaled \$1.658 billion as of December 31, 2008, minimize cash outlays for taxes through 2017.
- The number of shares outstanding increases as stock options and warrants are exercised and the convertible debt is converted to equity.

BALANCE SHEET[#] (Fiscal year ends on December 31st.)

ASSETS	6/30/2009	12/31/2008
Current Assets		
Cash & equivalents #	33,967	46,492
Accounts Receivable	-	1,500
Inventory	-	-
Other	4,533	5,983
Total Current Assets	\$ 38,500	\$ 53,975
Property & equipment	\$ 226,221	\$ 226,436
Other	2,405	2,048
Total Assets	\$ 267,126	\$ 282,459
LIABILITIES		
Current Liabilities		
Accounts payable	\$ 11,171	\$ 15,630
Debt due	-	-
Other	27,718	37,842
Total Current Liabilities	\$ 38,889	\$ 53,472
Long-term debt	\$ 247,506	\$ 142,253
Other	-	-
Total Long-Term Liabilities	\$ 247,506	\$ 142,253
Shareholders Equity		
Common Stock, par value	\$ 1,036	\$ 1,020
Additional Paid-In Capital	1,478,908	1,469,497
Accumulated Deficit	(1,499,213)	(1,383,783)
Treasury Stock	-	-
Total Shareholders Equity	\$ (19,269)	\$ 86,734
Total liabilities & equity	\$ 267,126	\$ 282,459

[#] All data is in thousands. Also, the June 30th balance sheet does not reflect an equity offering completed in August that raised \$59.6 million in cash.

CASH FLOW & CAPITALIZATION TABLE #

All figures are in thousands

Sources of Cash	2009	2010	2011	2012	2013
Net Income \$	(231,000)	(106,684)	50,034	167,929	281,738
Depreciation/Amortization	18,500	19,000	19,500	20,000	21,000
Stock-based Compensation	26,000	40,000	35,000	27,000	28,000
Tax loss carryforwards			12,509	102,924	172,678
Licensing payments	-	100,000	50,000	-	-
Debt Financing	105,000				
Common Equity Financing	61,000	7,500	35,000	42,000	116,000
Total Sources of Cash \$	(20,500)	59,816	202,043	359,854	619,416
Uses of Cash					
Capital Expenditures \$	25,000	30,000	30,000	32,000	85,000
Adj for amortiz. licensing payments	-	20,000	30,000	30,000	30,000
Debt Retired				132,253	115,000
Total Uses of Cash \$	25,000	50,000	60,000	194,253	230,000
Working Cap'l at Yearend \$	(44,997)	(35,181)	106,862	272,463	661,879
Capitalization	2009	2010	2011	2012	2013
Ending LT Debt \$	247,253	247,253	247,253	115,000	-
Ending Stockholders' Equity \$	(83,266)	(182,450)	(97,415)	112,514	510,252

Assumptions of Cash Flow & Capitalization:

- Since stock-based compensation is performance based, FDA approval and filing for approval by European regulators should trigger an increase in this non-cash expense in 2010 and 2011.
- Tax-loss carryforwards will minimize cash tax payments, starting in 2011.
- Licensing payments consist of a \$100 million upfront fee in 2010 and a \$50 million milestone for European approval in 2011.
- Common equity financing consists largely of the exercise of stock options and warrants, plus the conversion of convertible debt in 2013.
- Capital expenditures through 2012 will be largely for new production lines and plant maintenance. In 2013, construction of a new manufacturing plant begins, resulting in an increase in capital investments.
- Adjustments for amortization of upfront and milestone payments are made to reverse the recognition of such payments over five year periods for the Income Statement and Discounted Cash Flow Analysis. In contrast, the Cash Flow & Capitalization Table on this page recognizes such payments at the estimated time the cash will be received, as discussed above.
- Debt retired in 2012 is simply repaid in cash, while the 2013 retirement is triggered by a conversion to common stock.

DISCOUNTED CASH FLOW ANALYSIS#

All data are in thousands, except for per-share figures.

	2009	2010	2011	2012	2013
Revenue	\$ -	\$ 40,861	\$ 258,627	\$ 548,949	\$ 859,456
Operating income	-240000	-115684	53543	266054	453416
Net income	-231000	-106684	50034	167929	281738
Depreciation/amortization	18500	19000	19500	20000	21000
Stock-based compensation	26000	40000	35000	27000	28000
Tax loss carryforwards	0	0	12509	102924	172678
Capital expenditures	-25000	-30000	-30000	-32000	-85000
Total cash flow adjustments	19,500	29,000	37,009	117,924	136,678
Free cash flow	\$ (211,500)	\$ (77,684)	\$ 87,043	\$ 285,854	\$ 418,416
Risk-adjusted free cash flow	\$ (211,500)	\$ (77,684)	\$ 69,634	\$ 228,683	\$ 334,733

Discount Rate	Discounted Cash Flows (2008 - 2023)	PV of Terminal Value at a Perpetual growth rate of rFCF			Enterprise Value		
		2.0%	3.0%	4.0%	2.0%	3.0%	4.0%
		7.5%	\$3,930,615	\$ 4,414,931	\$ 5,448,929	\$ 7,073,783	\$8,345,546
10.0%	\$3,101,076	\$ 2,149,974	\$ 2,481,203	\$ 2,922,841	\$5,251,050	\$5,582,279	\$6,023,917
12.5%	\$2,467,655	\$ 1,169,328	\$ 1,305,086	\$ 1,472,787	\$3,636,983	\$3,772,741	\$3,940,442
15.0%	\$1,978,632	\$ 679,208	\$ 743,022	\$ 818,439	\$2,657,840	\$2,721,654	\$2,797,071
17.5%	\$1,597,149	\$ 412,585	\$ 445,363	\$ 482,998	\$2,009,734	\$2,042,512	\$2,080,146

Discount Rate	Net Debt	Total Equity Value			Value per Diluted Share		
		2.0%	3.0%	4.0%	2.0%	3.0%	4.0%
		7.5%	\$ 213,539	\$8,132,007	\$9,166,005	\$10,790,859	\$ 60.24
10.0%	213,539	\$5,037,511	\$5,368,740	\$5,810,378	\$ 37.31	\$ 39.77	\$ 43.04
12.5%	213,539	\$3,423,444	\$3,559,202	\$3,726,903	\$ 25.36	\$ 26.36	\$ 27.61
15.0%	213,539	\$2,444,301	\$2,508,115	\$2,583,532	\$ 18.11	\$ 18.58	\$ 19.14
17.5%	213,539	\$1,796,195	\$1,828,973	\$1,866,607	\$ 13.31	\$ 13.55	\$ 13.83

Discount Rate	Terminal Value as % Enterprise Value			Implied EBITDA Multiple		
	2.0%	3.0%	4.0%	2.0%	3.0%	4.0%
	7.5%	52.9%	58.1%	64.3%	11.47	14.15
10.0%	40.9%	44.4%	48.5%	7.88	9.10	10.72
12.5%	32.2%	34.6%	37.4%	6.01	6.70	7.57
15.0%	25.6%	27.3%	29.3%	4.85	5.31	5.85
17.5%	20.5%	21.8%	23.2%	4.07	4.39	4.76

Assumptions regarding the Discounted Cash Flow Analysis:

- The DCF model projects cash flow through 2024, discounted back at multiple annual rates (7.5%, 10.0%, 12.5%, 15.0%, and 17.5%) to demonstrate the potential variability related to this assumption. It also includes three perpetual growth rates (2%, 3%, and 4%) to show the impact on the present value of the company's terminal value. The rates used in calculating the per-share value for Mannkind are a 12.5% annual discount rate and a perpetual growth rate of 3%. The number of fully-diluted shares estimated to be outstanding in 2013, 135 million, is used in the per-share calculation.
- The cash flows are risk adjusted, based on the gross profit contribution by Afresa on an annual basis and the probability of that therapy being commercialized as assumed. For any years in which we are projecting negative cash flow, the probability is conservatively set at 100%.

DISCLOSURES

ANALYST(S) CERTIFICATION: The analyst(s) responsible for covering the securities in this report certify that the views expressed in this research report accurately reflect their personal views about Pluristem Therapeutics, Inc. (the “Company”) and its securities. The analyst(s) responsible for covering the securities in this report certify that no part of their compensation was, is, or will be directly or indirectly related to the specific recommendation or view contained in this research report.

MEANINGS OF RATINGS: Our rating system is based upon 12 to 36 month price targets. **BUY** describes stocks that we expect to appreciate by more than 20%. **HOLD** describes stocks that we expect to change plus or minus 20%. **SELL** describes stocks that we expect to decline by more than 20%. **SC** describes stocks that Griffin Securities has **Suspended Coverage** of this Company and price target, if any, for this stock, because it does not currently have a sufficient basis for determining a rating or target and/or Griffin Securities is redirecting its research resources. The previous investment rating and price target, if any, are no longer in effect for this stock and should not be relied upon. **NR** describes stocks that are **Not Rated**, indicating that Griffin Securities does not cover or rate this Company.

DISTRIBUTION OF RATINGS: Currently Griffin Securities has assigned BUY ratings or NO RATINGS on all of the companies it covers. The Company has provided investment-banking services for 18% of companies in which it has had BUY ratings in the past 12 months, 0% for companies in which it has had NR or no coverage in the past 12 months or has suspended coverage (SC) in the past 12 months.

MARKET MAKING: Griffin Securities does not maintain a market in the shares of this Company or any other Company mentioned in the report.

COMPENSATION OR SECURITIES OWNERSHIP: The analyst(s) responsible for covering the securities in this report receive compensation based upon, among other factors, the overall profitability of Griffin Securities, including profits derived from investment banking revenue. The analyst(s) that prepared the research report did not receive any compensation from the Company or any other companies mentioned in this report in connection with the preparation of this report. The analysts responsible for covering the securities in this report do not currently own common stock in the Company, but in the future may from time to time engage in transactions with respect to the Company or other companies mentioned in the report. Griffin Securities from time to time in the future may request expenses to be paid for copying, printing, mailing and distribution of the report by the Company and other companies mentioned in this report. Griffin Securities expects to receive, or intends to seek, compensation for investment banking services from the Company in the next three months.

PRICE CHART



Source: Big Charts

FORWARD-LOOKING STATEMENTS: This Report contains forward-looking statements, which involve risks and uncertainties. Actual results may differ significantly from such forward-looking statements. Factors that might cause such a difference include, but are not limited to, those discussed in the “Risk Factors” section in the SEC filings available in electronic format through SEC Edgar filings at www.SEC.gov on the Internet.

GENERAL: Griffin Securities, Inc. (“Griffin Securities”) a FINRA (formerly known as the NASD) member firm with its principal office in New York, New York, USA is an investment banking firm providing corporate finance, merger and acquisitions, brokerage, and investment opportunities for institutional, corporate, and private clients. The analyst(s) are employed by Griffin Securities. Our research professionals provide important input into our investment banking and other business selection processes. Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients that reflect opinions that are contrary to the opinions expressed herein, and our proprietary trading and investing businesses may make investment decisions that are inconsistent with the recommendations expressed herein.

Griffin Securities may from time to time perform corporate finance or other services for some companies described herein and may occasionally possess material, nonpublic information regarding such companies. This information is not used in preparation of the opinions and estimates herein. While the information contained in this report and the opinions contained herein are based on sources believed to be reliable, Griffin Securities has not independently verified the facts, assumptions and estimates contained in this report. Accordingly, no representation or warranty, express or implied, is made as to, and no reliance should be placed on, the fairness, accuracy, completeness or correctness of the information and opinions contained in this report.

The information contained herein is not a complete analysis of every material fact in respect to any company, industry or security. This material should not be construed as an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. We are not soliciting any action based on this material. It is for the general information of clients of Griffin Securities. It does not take into account the particular investment objectives, financial situations, or needs of individual clients. Before acting on any advice or recommendation in this material, clients should consider whether it is suitable for their particular circumstances and, if necessary, seek professional advice. Certain transactions - including those involving futures, options, and other derivatives as well as non-investment-grade securities - give rise to substantial risk and are not suitable for all investors. The material is based on information that we consider reliable, but we do not represent that it is accurate or complete, and it should not be relied on as such. The information contained in this report is subject to change without notice and Griffin Securities assumes no responsibility to update the report. In addition, regulatory, compliance, or other reasons may prevent us from providing updates.

DISCLOSURES FOR OTHER COMPANIES MENTIONED IN THIS REPORT: To obtain applicable current disclosures in electronic format for the subject companies in this report, please refer to SEC Edgar filings at www.SEC.gov. In particular, for a description of risks and uncertainties related to subject companies’ businesses in this report, see the “Risk Factors” section in the SEC filings.