



Actinium Pharmaceuticals, Inc.

NYSE MKT: ATNM

September 16, 2014
Target Price: \$20.95
Recent Price: \$5.99

Market Data

| | |
|--------------------------|-------------|
| Fiscal Year | December 31 |
| Industry | Biotech |
| Market Cap | \$168.6M |
| Price/Earnings (ttm) | N/A |
| Price/Book (mrq) | 38.2x |
| Price/Sales (ttm) | N/A |
| Insider Ownership | 22.2% |
| Institutional Ownership | 8.3% |
| Shares Outstanding | 28.1M |
| Float | 22.4M |
| Avg. Daily Vol. (3 mos.) | 141,978 |

As of September 15, 2014

Income Snapshot

| | |
|----------|-----------|
| | TTM |
| Revenue | \$0.0M |
| EBITDA | (\$11.6M) |
| Net Loss | (\$20.5M) |

Balance Sheet Snapshot

| | |
|------|---------|
| | MRQ |
| Cash | \$14.7M |
| Debt | \$0.1M |

Company Website

<http://www.actiniumpharmaceuticals.com/>

Company Overview

Actinium Pharmaceuticals, Inc. is a New York-based biopharmaceutical company developing innovative targeted payload immunotherapeutics for the treatment of advanced cancers. Actinium's targeted radiotherapy is based on its proprietary delivery platform for the therapeutic utilization of alpha-emitting actinium-225 and bismuth-213 and certain beta emitting radiopharmaceuticals in conjunction with monoclonal antibodies. The Company's lead radiopharmaceutical Iomab™-B is indicated for preparing patients for hematopoietic stem cell transplant (HSCT), commonly referred to as bone marrow transplant. The Company is preparing a single, pivotal, multicenter Phase III clinical study of Iomab™-B in refractory and relapsed Acute Myeloid Leukemia (AML) patients over the age of 55 with a primary endpoint of durable complete remission. The Company's second program, Actimab-A, is continuing its clinical development in a Phase I/II trial for newly diagnosed AML patients over the age of 60 in a single-arm multicenter trial, with interim data expected in December.

Value Proposition

Assuming Iomab-B begins sales in 2017 for patients over 55 with relapsed/refractory AML and AML patients that are unable to receive chemotherapy, and Actimab-A begins sales in 2019 for all AML patients over the age of 60, gives a probability adjusted NPV of \$805.6 million. Taking into consideration cash on hand and cash from warrant/option exercises, and dividing by fully diluted shares outstanding of 40.5 million, gives a target price of \$20.95.

Investment Highlights

- Iomab-B is being prepared for a phase III trial to condition patients with relapsed/refractory Acute Myeloid Leukemia (AML) for Bone Marrow Transplantation (BMT), a \$600 million U.S. market with ineffective treatment options
- Phase III trial for Iomab-B has, in our judgment, a very achievable endpoint
- Iomab-B is projected to be more economically feasible than the current standard of care
- Iomab-B trial sites should help facilitate rapid adoption if approved, leading to a quicker sales ramp
- ATNM's Bismab-A demonstrated strong efficacy in two clinical trials; provides compelling data that supports the potential of ATNM's next generation Actimab-A program.
- In comparable trials, Actimab-A has demonstrated superior efficacy as compared to Bismab-A
- Actimab-A showed positive safety data in a phase I trial
- Actimab-A is currently in a phase I/II trial for AML
- Actimab-A platform has the potential to be used across multiple indications, giving the technology multibillion dollar potential
- Biobetters have the potential to add additional revenue streams

Investment Highlights

Iomab-B

Iomab-B, is being prepared for a phase III trial to condition patients with relapsed/refractory Acute Myeloid Leukemia (AML) for Bone Marrow Transplantation (BMT), a \$600 million U.S. market with ineffective treatment options. Iomab-B is being developed by ATNM for use as a myeloconditioning agent for older patients who need less toxic conditioning in order to receive a Hematopoietic Stem Cell Transplantation (HCST) commonly known as Bone Marrow Transplant, which is the fastest-growing hospital procedure in the United States. HCST is used to treat a multitude of disorders including AML, Multiple Myeloma, Non-Hodgkin Lymphoma, and other disorders, by either the transplantation of bone marrow or that of blood stem cells isolated from peripheral blood. If Iomab-B's phase III trial for AML is successful, the possibility exists to use Iomab-B in other indications. As the following chart indicates, clinical trial work for Iomab-B has already occurred in many other indications:

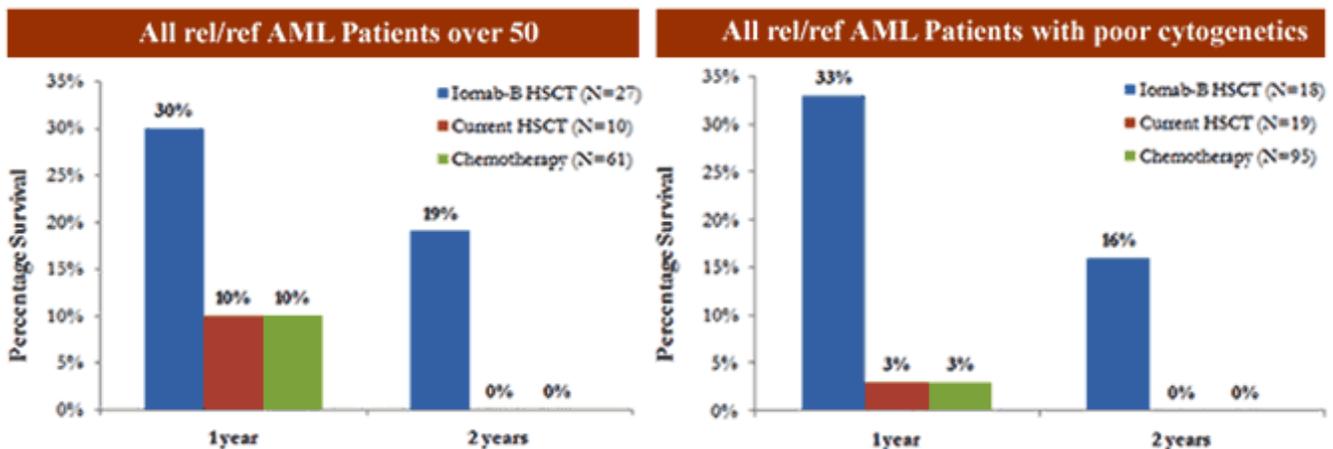
| Indication | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | WW Mkt. potential |
|--|------|------|------|----------|-------------|------|----------|-------------|-------------|-------|-------------------|
| Acute Myeloid Leukemia | | III | | Approval | Sales start | | | | | | \$ 793 |
| Myelodysplastic Syndrome | II | | | | III | | Approval | Sales start | | | \$ 264 |
| Acute Lymphoblastic Leukemia | II | | | | III | | Approval | Sales start | | | \$ 264 |
| Non-Hodgkins Lymphoma and Hodgkins disease | I | II | | | III | | Approval | Sales start | | | \$ 1,455 |
| Multiple Myeloma | I | II | | | III | | | Approval | Sales start | | \$ 1,322 |
| | | | | | | | Approval | | | Total | \$ 4,098 |

HSCT involves replacing diseased cells with Hematopoietic Stem Cells (HSCs) which will go on to differentiate into the cells they are replacing. Prior to undergoing HSCT, patients must undergo a conditioning regimen which usually consists of different types of chemotherapy or irradiation. There is currently no standard of care, and the different treatments all essentially have the same poor outcomes. The conditioning regimen is especially harsh for older patients (55+) and in many instances leads to life threatening side effects. In the case of AML, over 2/3's of the patients are over 55. In addition to a predominantly older population, there are also patients with relapsed/refractory AML that does not respond to chemotherapy/radiation, which represents a majority of these older patients. Given these alarming facts, there has been an unmet need for an alternative form of bone marrow transplantation preparation. Successful phase I and phase II clinical trials of

Iomab-B have demonstrated the ability to satisfy this unmet need of providing older patients with a treatment that improves complete remission and survival rates and is not accompanied by myriad life-threatening side effects.

Iomab-B consists of the in-licensed BC8 monoclonal antibody (mAb) and the beta-emitting Iodine-131 radioisotope. The BC8 mAb targets the CD45 antigen, an antigen that is present on all differentiated hematopoietic cells excluding erythrocytes (red blood cells) and plasma cells (white blood cells that secrete large amounts of antibodies). Iomab-B conditions patients for bone marrow transplantation by targeting cells that express the CD-45 antigen and damaging them via beta irradiation. In doing so, Iomab-B destroys both healthy and cancer cells and creates the desired “clean-slate” for the bone marrow transplantation.

In Phase I and Phase II trials, Iomab-B was rendered successful as a myeloconditioning (pretransplant conditioning) agent in over 250 patients with AML. The successful Phase I and II clinical trials led to ATNM and the FDA determining that a single Phase III study would be adequate. The trial population in Phase III will be relapsed/refractory AML patients over the age of 55 and will consist of two arms (one for Iomab-B and one for the control arm) of 75 patients each, giving an overall total of 150 patients. The following graph indicates the superior results seen in Iomab-B in two different poorly performing patient groups; all relapsed/refractory AML patients over 50, and all relapsed/refractory AML patients with poor cytogenetics. Iomab-B, for all relapsed/refractory AML patients over the age of 50, had a 30% survival rate after one year vs. 10% for the standard of care and after two years had a 19% survival rate vs. 0% for the standard of care. For all relapsed/refractory AML patients with poor cytogenetics, Iomab-B had a 33% survival rate after one year vs. 3% for the standard of care, and after two years had a 16% survival rate vs. 0% for the standard of care.



Based on the current standard of care, patients with AML that are over 50 or have poor cytogenetics essentially have no chance of survival, as indicated by the 0% survival rate after two years. This is because many of these patients are not healthy

enough to receive chemotherapy and a bone marrow transplant and are essentially kept in care until they die. Iomab-B has a chance to change this and give patients a chance to live with AML. In prior clinical trials, Iomab-B has achieved a 100% complete remission rate, further showing the extremely strong data that the treatment has produced to date.

Phase III trial for Iomab-B has, in our judgment, a very achievable endpoint.

The primary endpoint will be the rate of durable complete remission. The first patient enrollment is expected in 1H15, with the BLA submission anticipated in 1H17. The primary endpoint will be achieving a 100% complete remission rate, which is defined as a complete remission lasting at least 180 days, and the secondary endpoint will be overall survival at one year. In previous Phase I/II trials, Iomab-B already showed a complete response rate of 100%, and response rates for the current standard of care are far below this. We believe that the complete response rate provides a relatively low hurdle for the Company to clear and provides an increased chance of successfully completing Phase III trials, as compared to the average oncology treatment in Phase III trials.

Iomab-B is projected to be more economically feasible than the current standard of care.

The current overall cost estimate for a regimen of Iomab-B is up to \$200,000 per patient (includes the cost of HSCT treatment after treatment with Iomab-B), as opposed to the current overall standard of care cost for older, relapsed/refractory AML patients of \$330,000 per patient. If the improvements in efficacy and safety data last through the Phase III trial, the projected lower price of treatment should help facilitate quick adoption of Iomab-B, as not only is it a superior treatment option, it is also more economically feasible.

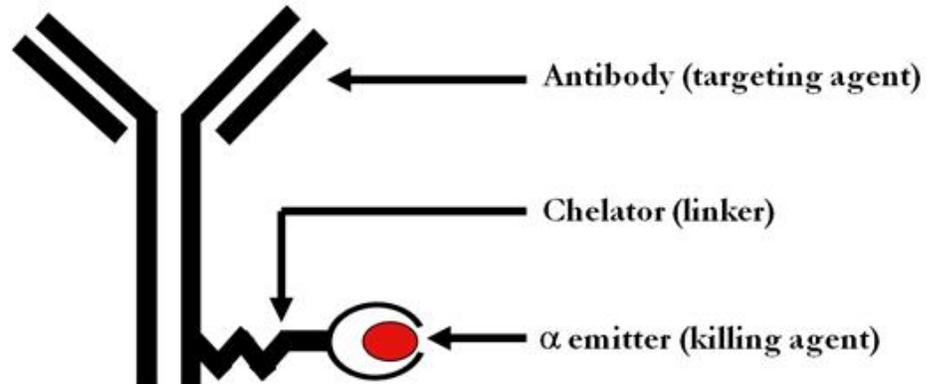
Iomab-B trial sites should help facilitate rapid adoption if approved, leading to a quicker sales ramp.

According to the U.S. Department of Health and Human Services, the top ten cancer centers perform 30% of AML allogeneic transplants. ATNM is conducting its Phase III trial for Iomab-B at multiple leading cancer centers. Top thought leaders from these centers are also on ATNM's clinical advisory board. With a small number of top centers performing many of the transplants, and Iomab-B already being used in many of these centers in the Company's clinical trials, ATNM is likely to see a faster than usual ramp in sales if approved. Cash flow from Iomab-B will be important in funding its Actimab platform or Iomab-B in other indications. Obtaining positive cash flow from one of its therapies will reduce dilution and funding for its indications going forward.

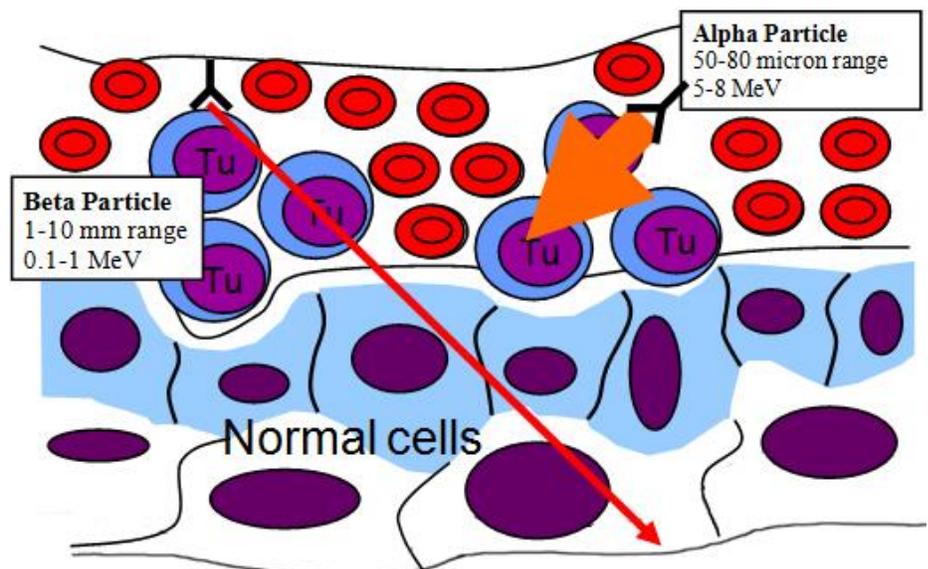
Actimab-A

ATNM's proprietary Alpha Particle Immunotherapy (APIT) platform is a highly potent and selective form of targeted radiotherapy. Co-developed with Memorial Sloan Kettering Cancer Center, the APIT platform utilizes the powerful alpha particle emitting Actinium-225 radioisotope. This radioisotope is bound to a

monoclonal antibody (mAb) via a chelator (linking agent) at the constant region of the heavy chain. The figure below is a visual representation of the binding:



The monoclonal antibody's variable region (the region which determines which epitopes, or targets, that the mAb binds to) is modified to target specific substrates on a cancer cell of interest's surface. By virtue of this mechanism, the powerful alpha emitters are selectively delivered to cancer cells, where they act by killing the target via irradiation. The killing power of a radioactive particle is directly proportional to its energy and inversely proportional to the range it travels. Beta particles travel a large distance (1-10 mm range) and have low energy levels (0.1-1 MeV), thus their killing powers are relatively low. Alpha particles on the other hand, contain larger amounts of energy (5-8MeV) and travel shorter distances (50-80 micron range). This is ideal for the purposes of cancer therapy. Because alpha particles have higher killing power and travel shorter distances than beta particles, they cause more damage to target cells and cells in the immediate periphery, while their damage to healthy, more distant tissue is limited. The image below demonstrates the effects of alpha particles when compared to those of beta particles.



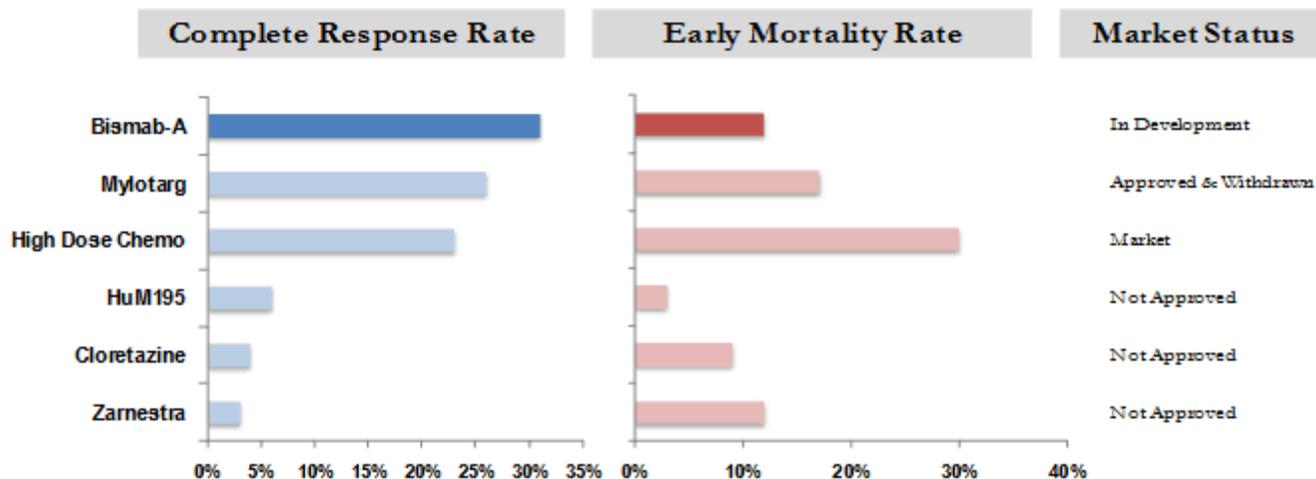
Alpha particles are about 100x more powerful than beta particles, which make them effective in some cancers that are not sensitive to beta irradiation such as AML.

Despite the disease not being considered particularly radiosensitive, APIT has demonstrated extremely high cancer kill levels in this particular disease state, a promising result for what many deemed a disease immune to irradiation.

ATNM's Bismab-A demonstrated strong efficacy in two clinical trials; provides compelling data that supports the potential of ATNM's next generation Actimab-A program. Dr. Joseph Jurcic, director of Hematological Malignancies at the Hematology/Oncology division of Columbia University Medical Center, led the Phase I/II clinical trial of Bismab-A at Memorial Sloan Kettering Cancer Center. Bismab-A utilizes the lintuzumab monoclonal antibody, which Actinium licensed from PDL BioPharma (now Abbot Biotherapeutics). Lintuzumab targets the CD33 transmembrane receptor protein, which is heavily expressed in AML and other myeloproliferative diseases, but does not appear in abundance on normal cells. The trial demonstrated the safety, feasibility and clinical activity of Bismab-A. While human clinical trial data in Bismab-A is somewhat limited, the clinical trials showed that median survival was about 4x greater than the standard of care (the trial showed 7.7 months of survival for patients with previously untreated AML, and 3.1 months of survival for patients with previously treated AML), which is normally either supportive or high dose chemotherapy (only 36% of patients age 60+ are eligible for high dose chemotherapy).

Despite the successes of Bismab-A, Dr. Jurcic and the researchers recommended that ATNM halt further development of Bismab-A in lieu of supply, logistics, and cost reasons. Bismuth-213, the key radioisotope utilized in Bismab-A, is made from Actinium 225 in a process that requires large amounts of the latter, leading to overly burdensome high costs. Additionally, Bismab-A was commercially constrained by a short, 46-minute half-life limiting the ability to centrally manufacture and distribute the drug. For these reasons, ATNM intends on instead developing the Actimab-A platform (a second generation product based on the alpha emitter Actinium 225), which has far superior potency (500x more potent) at lower dosing levels, supply and logistics advantages (centralized manufacturing), a lower cost (10x lower COGS) and a much longer 10-day half-life. The longer half-life provides plenty of time to manufacture the drug and allow the drug to reach the target site.

There was very important information gathered from the Bismab-A clinical trials, which can be used to infer the success of Actimab-A, given the similarities between the two. The studies demonstrated that Bismab-A maintained a low side effect record and clear indications of efficacy. The chart below compares the safety and efficacy data of Bismab-A to other products that are both approved and in development. Based on the results, Bismab-A has efficacy similar to approved products and superior pipeline products, while maintaining a better side effect profile than approved products.



- Complete Response represents eradication of leukemia cells after treatment
- 64% of patients over 60 are not eligible for high dose chemotherapy

In comparable trials, Actimab-A has demonstrated superior efficacy as compared to Bismab-A. The superior efficacy of Actimab-A as compared to Bismab-A is indicated by the following data:

| Parameter | Bismab-A | Actimab-A |
|---|----------|-----------|
| Elimination of peripheral blasts | 27% | 63% |
| Bone Marrow blasts decrease by 50% or more | 28% | 50% |
| Bone Marrow blasts 5% or less post treatment* | 0% | 20% |

* More than 5% of bone marrow blasts signifies persistent presence of leukemia cells.

Elimination of peripheral blasts has been shown to be an accurate predictor of complete remission in AML. Large decreases in bone marrow blasts indicate that AML is improving. In normal bone marrow, bone marrow blasts are under 5%, so achieving bone marrow blasts of under 5% (like in 20% of Actimab-A cases) is an indication that the patient is in remission.

Bismab-A’s clinical trials were recommended to stop primarily due to cost concerns, not efficacy concerns. As shown in the Bismab-A comparison chart earlier, Bismab-A had a higher complete response rate than competing therapies and had among the lowest early mortality rates. Actimab-A has had superior efficacy to Bismab-A so far; if results such as this are confirmed in subsequent trials, Actimab-A could prove to be a blockbuster drug for AML.

Actimab-A showed positive safety data in a Phase I trial. ATNM has already conducted a Phase I dose escalation trial using a single dose of Actimab-A in collaboration with Memorial Sloan Kettering Cancer Center in order to determine the safety, pharmacology, and biological activity of Actimab-A in AML. In this trial, 18

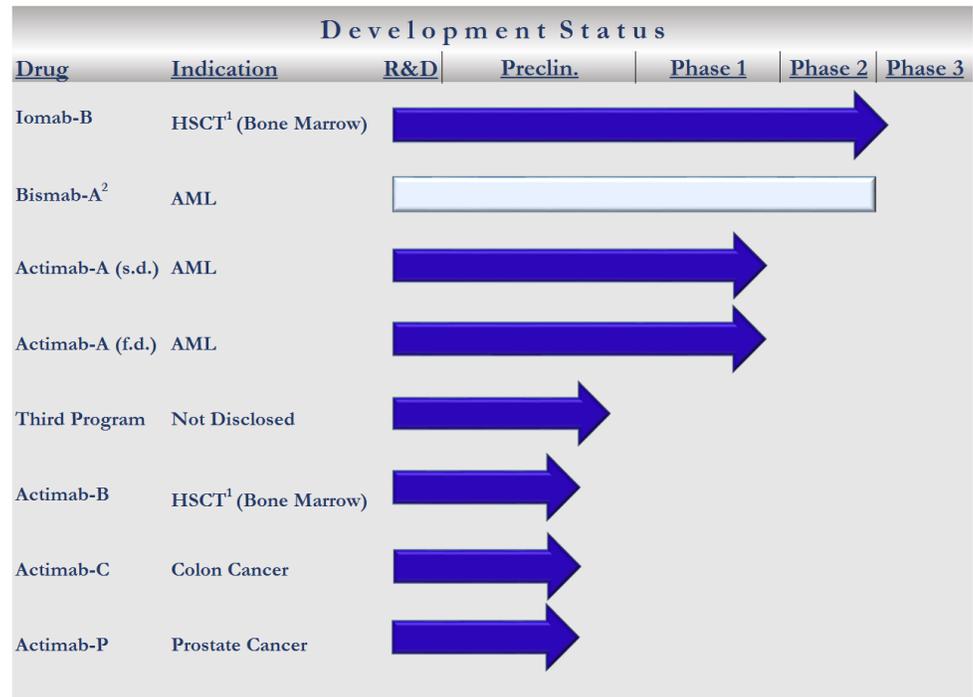
patients, ages 45-80 (median age: 64 years), with relapsed/refractory AML, received a single infusion of Actimab-A.

In this study, no acute toxicities were seen, and dose limiting toxicity was seen in one patient treated with 3 microCuries ($\mu\text{Ci}/\text{kg}$) and in both patients receiving 4 $\mu\text{Ci}/\text{kg}$. No damage to the kidneys was seen, and toxicities outside of the target organ were limited to transient grade 2/3 liver function abnormalities. Of the 16 patients who received a full treatment dose, 10 saw an elimination of peripheral blood blasts (leukemia cells), and bone marrow blast reductions of over 33% were seen in 10 of 15 evaluable patients at the four week mark. The trial showed that Actimab-A is tolerable at doses of less than 4 $\mu\text{Ci}/\text{kg}$ and that it has antileukemic activity. This data provides initial data that will help the Company determine the optimal dosing schedule in its phase I/II AML trial, which will have two consecutive fractionated doses of Actimab-A.

Actimab-A is currently in a Phase I/II trial for AML. ATNM is currently in a multi-center Phase I/II AML clinical trial, with the Phase I, dose-escalating portion, currently ongoing. In this trial, ATNM is using two consecutive fractionated doses of Actimab-A. There is a maximum enrollment of 21 patients in the Phase I portion, which will be put into four separate, dose-escalating cohorts. This trial should determine the maximum tolerated dosage (MTD) of Actimab-A. Data from this trial is expected to be released in late 2014, and following this, ATNM will commence the Phase II portion of the trial, which is expected to last for 12-18 months. The MTD determined in the Phase I portion of the trial will be used as the dosage in the Phase II trial. The Phase II portion of the trial will enroll up to 53 patients.

Application for Orphan Drug Designation filed with the FDA for Actimab-A. ATNM has filed an Application for Orphan Drug Designation for Actimab-A with the FDA. This was filed due to the fact that there are limited or no treatment options for many AML patients over 60, due to the fact that they are unable to receive the current standard of care, which is chemotherapy. Orphan-designated drugs are potentially eligible for a faster approval process and additional market exclusivity. If approved for orphan drug status, ATNM may be able to bring Actimab-A to the market faster than expected, pending positive clinical trial results.

ATNM's Actimab-A platform has the potential to be used across multiple indications, giving the technology a multibillion dollar potential.



Potential therapies in the pre-clinical stage include Actimab-B (HCST), Actimab-C (metastatic colon cancer), and Actimab-P (prostate cancer). Actimab-B utilizes the same monoclonal antibody as Iomab-B, BC8, and replaces the I-131 radioisotope with Ac-225, thus potentially further increasing the drug's potency. Similar to Iomab-B, it would be utilized as a myeloconditioning agent. Actimab-C, which utilizes the in-licensed A33 monoclonal antibody, has shown acceptable toxicity profiles and encouraging proof of principal efficacy in mouse models, with complete elimination of metastatic disease in a number of animals. ATNM is also collaborating with Memorial Sloan Kettering Cancer Center and a third party to develop an Ac-225 labeled monoclonal antibody that targets PSMA, a dimeric type II integral membrane glycoprotein that is highly expressed on prostate cancer cells. The versatility of the concept allows for utilization in the treatment of Glioblastoma Multiforme (GBM) as well as many other diseases that express unique antigens. There is a strong possibility that one of the therapies in preclinical trials could begin planning for a Phase I clinical trial by early 2015.

The APIT platform can deliver additional benefit through the expansion of monoclonal antibodies. The APIT platform contains three critical parts: the monoclonal antibody which selectively binds an epitope on the target, the alpha-emitting radioisotope which damages the target cell, and the chelator which links the radioisotope to the monoclonal antibody. By changing the monoclonal antibody in this construct, ATNM has the potential to combat other disease states with alpha-emitting radioisotopes, assuming these other disease states express unique antigens and there is a monoclonal antibody (or the potential to develop a monoclonal

antibody) to target these antigens. As monoclonal antibodies are developed/identified, ATNM has the potential to expand its APIT platform over time.

Value of alpha particle technology indicated by Bayer acquisition of Algeta. In 2013, the first alpha-pharmaceutical, Xofigo by Algeta (now a subsidiary of Bayer), was approved in the U.S. Having originally signed an \$800M agreement with Bayer for the development and commercialization of Xofigo, Bayer completed a voluntary takeover of Algeta for \$2.6 billion in early 2014. Despite not being directly comparable to Algeta, due to the fact that ATNM does not have any marketed drugs, there is the potential for Actinium-225 to ultimately be used in a wider array of cancers than radium-223 (Xofigo). Radium-223 has been shown to be effective in treating bone cancer; however, the element radium is only attracted to bone and thus can, as of now, only be used to treat bone cancers. Actinium-225 has the potential to be directly targeted to various other sites in the body, potentially giving it more value if clinical trials show its effectiveness in multiple different types of cancer.

Beyond Algeta, there is only one other company (Areva Med/Roche) developing alpha emitter technology; however, due to the short half-life of these alpha emitters, this technology, in our view, is unlikely to be economically feasible. This leaves ATNM as the only economically feasible alpha emitter technology in the market, and if clinical trials are positive an increase in valuation may occur.

Biobetters

Biobetters have the potential to add an additional revenue stream for the Company. ATNM intends to improve currently marketed biotech drugs through the addition of alpha emitters. Many monoclonal antibodies are approaching expiration. Upon expiration, ATNM intends to work with the owners of the antibodies in order to develop more potent therapies through the combination of these antibodies with the APIT platform. The idea is to take a drug that is already successful and improve its efficacy and safety even further. This also gives the owners of the antibodies new, extended patent protection. We expect that the Company would enter deals with the original monoclonal antibody owners through joint ventures and/or licensing deals.

An example of this is ATNM working with Philogen to combine ATNM's Ac-225 alpha emitter with Philogen's L19 antibody. This further enhances the long-term revenue potential of ATNM's APIT platform. This type of program is also being explored by Areva Medical and Roche, with Areva Medical attaching its alpha emitter to Roche's Herceptin drug.

Algeta, which developed the first alpha emitter to reach the market and was recently acquired by Bayer, is also exploring the possibility of using the alpha emitter Thorium 227 as a biobetter. However, this is still in preclinical trials, while Actinium 225 is in Phase I/II trials.

ATNM CEO Dr. Kaushik J. Dave left behind a significant amount of compensation at his previous company, Antares Pharma; this indicates his confidence in ATNM's therapies. According to regulatory filings, Dr. Dave left his position as Senior Vice President of Product Development at Antares Pharma Inc. (ATRS), while still having over 190,000 non-vested ATRS options and over 130,000 shares of non-vested ATRS stock to accept the CEO position at ATNM, which, in our opinion, demonstrates his confidence in ATNM's potential. When he tendered his resignation from ATRS on August 15, 2013, ATRS's stock price was \$4.49 and its market cap was approximately \$573 million. During Dr. Dave's tenure, ATRS's market cap went from about \$40 million to \$573 million. While at ATRS, Dr. Dave led the clinical and regulatory approval of Anturool and changed ATRS's vision to combination products using ATRS's medical device technology. This expanded ATRS's pipeline and led to a New Drug Application submission for Otrexup.

ATNM has amassed an intellectual property portfolio of 35 issued and pending patents. ATNM's IP estate includes 7 U.S. and 26 international issued and pending patents. The patents include platform technology patents that cover the use of alpha emitting isotopes Actinium 225 and Bismuth 213 for cancer treatment, drug preparation method patents, and drug components related patents which include patents for the chelators (DTPA and DOTA) and monoclonal antibodies (which are specific for each different type of cancer). This combination of patents mitigates the risks of drug re-creation. This in turn minimizes the risk for patent infringement as well as introduction of generic drugs into the market, which can be sold at a relatively modest cost because of the simplicity of filing facilitated by the Hatch-Waxman Act & the associated Abbreviated New Drug Application (ANDA).

Recent capital raise provides funds to develop Iomab-B and Actimab-A. In June 2014, ATNM completed a capital raise which provided \$13.7 million in additional capital. These funds are anticipated to fund the Company's Phase III trial for Iomab-B and to expand its Phase I/II trial for Actimab-A. This should ensure that ATNM meets its near-term goals, and we believe the Company will be able to raise additional capital if positive results are obtained from Iomab-B and/or Actimab-A. The Phase III trial for Iomab-B is estimated to cost \$20-\$25 million, so current cash on hand (\$14.7 million in cash on hand as of June 30, 2014) should fund the majority of the costs of the trial.

Market

The U.S. AML market for Iomab-B is approximately \$600 million and worldwide it is approximately \$2 billion. In 2006, the Worldwide Network for Blood and Marrow Transplantation, a nongovernmental organization related to the World Health Organization, conducted a study and determined that there were 50,417 bone marrow transplants, with 43% (21,516) being Allogeneic, which utilizes a compatible donor's hematopoietic stem cells, and 57% (28,901) being Autologous, which utilizes the patient's own hematopoietic stem cells. Of the Allogeneic HSCTs, 33% (7,100) were for AML. Of these 50,417 HSCTs, 48% were performed in

Europe, 36% in the Americas, 14% in Asia, and the remaining 2% in the Eastern Mediterranean and Africa. A similar study conducted by the Center for International Blood & Bone Marrow Transplant research, estimated that the number had grown to 60,000 bone marrow transplants worldwide in 2010. Of these, about 34,000 were autologous and 26,000 were allogeneic. A study conducted by the U.S. Department of Health and Human services reported 17,938 HSCTs were performed in the U.S. in 2011.

Iomab-B is intended to act as a myeloconditioning agent for patients ineligible for traditional chemotherapeutic conditioning regimens. A study published in the *Biology of Blood and Marrow transplantation* demonstrates that the percentage of patients over 55 that are being treated with HSCT is growing rapidly. In 2000 only 8% of the total population that needed HSCT were over 55. By 2005 this number was 21% of the population, and it increased to 27% of the population by 2007. Using this data, and the assumption that Iomab-B will be priced at \$85,000 per treatment regimen, we predict that the total addressable market for AML (considering only those ineligible for traditional conditioning regimens) in the U.S. is roughly \$600 million (7,100 patients * \$85,000 per treatment) and the total worldwide market is about \$2 billion. As Iomab-B makes it possible for patients who cannot normally receive a bone marrow transplant to receive HSCT, it is very possible that the market could expand beyond current estimates as the eligible patient population expands.

Overall bone marrow transplant market in U.S. is estimated at \$1.3 billion and at \$4.1 billion worldwide (Europe and Japan). Physician trials in Phase I and Phase II have been ongoing at the Fred Hutchison Cancer Research Center. These include trials for Myelodysplastic Syndrome (estimated WW market potential: \$264 million), Acute Lymphoblastic Leukemia (estimated WW market potential: \$264 million), Non-Hodgkins Lymphoma and Hodgins disease (estimated WW market potential: \$1.5 billion), and Multiple Myeloma (estimated WW market potential: \$1.3 billion).

Myelodysplastic syndrome (MDS) is cancer where the bone marrow does not make enough healthy blood cells or there are abnormal cells in the bone marrow. There are approximately 13,000 new cases of MDS each year and about 33% of patients with MDS eventually develop AML. As with the majority of cancers, new cases are increasing as the average age of the population increases.

Acute Lymphoblastic Leukemia (ALL) is a cancer that mainly affects blood and bone marrow. The American Cancer Society projected 6,020 new cases of ALL in the U.S. in 2014, with 1,440 deaths. Approximately half of ALL cases occur in adults, and remission rates in adults tend to be much lower (approximately 20-40%).

Non-Hodgkin lymphomas are a large group of cancers of lymphocytes (white blood cells). Estimated new cases in the U.S. for 2014 are 70,800, and U.S. deaths are estimated at 18,990. Hodgkin lymphoma is much rarer, with estimated new cases in the U.S. for 2014 totaling 9,190, and U.S deaths for 2014 totaling 1,180. The risk of

non-Hodgkin's lymphoma increases with age, with it being most common in people age 60 or older.

The American Cancer Society estimates that there will be 24,050 new cases of multiple myeloma in 2014, with 11,090 deaths. Age is the most significant risk factor in multiple myeloma, with 63% of multiple myeloma patients being over the age of 65.

The AML market for Actimab-A is estimated at \$920 million in the U.S., EU, and Japan. The American Cancer Society estimates that there will be 18,860 new cases of AML in 2014 and 10,460 deaths from the disease. AML traditionally afflicts older patients, and the likelihood of getting AML increases with age. The average age of a patient is about 66 years old and 54% of patients are diagnosed at 65 years or older.

The current first-line treatment for AML is chemotherapy. It is estimated that 60%-70% of adults with AML can be expected to attain complete remission following treatment, with about 45% of those surviving three or more years. 65% of patients younger than 60 achieve complete remission. It is important to note however that there is a negative correlation between age and complete remission rates and this number decreases substantially with age. This older population is ATNM's target market.

A study completed in 2001 estimated that the total cost of treatment for AML was approximately \$104,000, with \$3,000 of the cost being diagnosis. Using a \$60,000 price point, we estimate that the total addressable market for Actimab-A in the US. is approximately \$600 million with a total worldwide market of \$920 million (in line with company estimates of assuming a lower price point per treatment in non-U.S. markets).

The Company's Actinium 225 platform has potential in multiple billion dollar markets. ATNM intends to introduce products into the U.S., Europe and Japan. We believe that the Company will attempt to develop U.S. product sales on its own but will likely enter into licensing agreements to sell into the European and Japanese markets. The Actimab-A potential markets are in the chart below (excluding Bone Marrow Transplants):

| # | Cancer Indication | Cases/Yr. in Target Market ¹ | Target Population | Worldwide Market Potential (\$mm) ² |
|-----------------|-------------------------------|---|-------------------|--|
| 1 st | Bone Marrow Transplant (BMT) | 48,000 | 48,000 | \$4,100 |
| 2 nd | Acute Myeloid Leukemia (AML) | 41,600 | 24,000 | \$920 |
| 3 rd | Glioblastoma Multiforme (GBM) | 26,500 | 26,500 | \$1,100 |
| 4 th | Prostate Cancer (metastatic) | 591,000 | 298,455 | \$5,959 |
| 5 th | Metastatic Colorectal Cancer | 536,000 | 241,200 | \$4,824 |

1. Target market includes USA, EU and Japan

2. Market Potential calculated based on assumption that Actinium products for solid cancer indications will be priced at \$20,000 per treatment; BMT preparation product will be priced at \$85,000 per treatment; AML product will be priced at \$60,000 per treatment; and GBM product will be priced at \$60,000 per treatment. Estimates based on independent third party research and adjusted for lower pricing in non-US markets.

ATNM is initially developing Actimab-A for AML (\$920 million market) and is expected to begin human clinical trials in one of the other above indications in late 2014/early 2015.

Glioblastoma multiforme (GBM) is the most frequent primary brain tumor, and there are approximately 10,000 new cases diagnosed each year in the U.S. The long-term prognosis for GBM is poor, and the median survival rate is currently only about 12-15 months. Current treatment for GBM is a combination of radiation and chemotherapy.

Prostate cancer is the second leading cause of death among men in the U.S., with the majority of these deaths related to metastatic or advanced prostate cancer. Currently, there is no cure for metastatic prostate cancer, and the goal for physicians is to prescribe treatments that extend overall survival while maintaining a high quality of life.

Approximately half of colon cancer patients are diagnosed with hepatic metastases, which denote colon cancer in stage III or stage IV. 5-year survival rates when colon cancer is caught early are fairly high, but begin to decline rapidly as the cancer progresses. The 5-year survival rate for stage III colon cancer is approximately 28%, and the 5-year survival rate for stage IV colon cancer is approximately 6%.

Valuation

Our valuation uses anticipated cash flows from Actinium's Iomab-B and Actimab-A therapies. Given current stages of development, we assume that Iomab-B is utilized for AML, MDS, and ALL, and that Actimab-A is utilized for AML. We project sales for Iomab-B to begin in 2017 for AML, 2019 for MDS, and 2021 for ALL. We project sales for Actimab-A for AML to begin in 2019. It is important to note that the valuation could increase substantially as Actimab-A passes clinical trials, either for AML or for one of its indications that it is currently in pre-clinical trials. Currently, we are only projecting a probability of success of 25% for Actimab-A, given the low rate of success for cancer drugs in early stage trials; however, we have given a slight increase in the typical success probability, given Actimab-A's similarities to Bismab-A, which showed significant efficacy in Phase II trials.

We believe that Iomab-B could have a significant ramp in penetration rate following its issuance into the market; this is based on the fact that Iomab-B can be available to treat a significant portion of the AML population that either is not responding to chemotherapy or cannot receive chemotherapy. There were an estimated 18,860 new cases of AML in the U.S. in 2014. Assuming that 65% of this population is over the age of 55 gives a patient population of 12,259. Of older patients that are able to receive chemo, approximately 40%-50% achieve complete remission. Assuming half of this population are relapsed/refractory to chemotherapy gives a patient population of 6,130. Additionally, assuming that 10% of the AML population over 55 is not able to receive chemotherapy, or 1,225 patients, gives a patient population of 7,355. Due

to the large need for the Iomab-B treatment, we project Iomab-B to have a penetration rate of 30% in the U.S. and 15% in Europe/Japan by 2020.

We anticipate Actimab-A having a larger potential AML market, due to it potentially replacing chemotherapy at the start of AML treatment. We assume the U.S. population to be 12,259, which is equal to the amount of new cases of AML for patients 55 and older. Ultimately, Actimab-A has the most potential as a therapy; this is due to its potential to be used in a larger percentage of the population for AML, its potential to be used in larger cancer populations that have billion dollar plus markets, and its potential to be used as a biobetter for already approved drugs, which could add an additional royalty stream for ATNM. As ATNM's Actimab-A therapy passes clinical trials and begins work with additional companies as a biobetter, we believe that the Company's valuation could increase significantly.

After taking into account current cash on hand, cash from potential option/warrant exercises, and assuming a fully diluted shares outstanding number of 40.5 million, we derive a fair value for ATNM of \$20.95.

| Iomab-B | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| U.S. AML Pop > 55 | 7,970 | 8,065 | 8,162 | 8,260 | 8,359 | 8,459 | 8,561 | 8,664 | 8,767 | 8,873 | 8,979 | 9,087 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 2.00% | 10.00% | 17.00% | 30.00% | 30.00% | 30.00% | 30.00% | 30.00% | 30.00% |
| ROW AML Pop >55 | 9,391 | 9,503 | 9,617 | 9,733 | 9,849 | 9,968 | 10,087 | 10,208 | 10,331 | 10,455 | 10,580 | 10,707 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 10.00% | 15.00% | 15.00% | 15.00% | 15.00% | 15.00% | 15.00% |
| US MDS Pop | 1,185 | 1,199 | 1,214 | 1,228 | 1,243 | 1,258 | 1,273 | 1,288 | 1,304 | 1,319 | 1,335 | 1,351 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 10.00% | 15.00% | 15.00% | 15.00% | 15.00% |
| ROW MDS Pop | 771 | 780 | 790 | 799 | 809 | 818 | 828 | 838 | 848 | 858 | 869 | 879 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.00% | 5.00% | 8.00% | 8.00% | 8.00% |
| US ALL Pop | 549 | 555 | 562 | 569 | 575 | 582 | 589 | 596 | 604 | 611 | 618 | 626 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 10.00% | 15.00% | 15.00% | 15.00% |
| ROW ALL Pop | 771 | 780 | 790 | 799 | 809 | 818 | 828 | 838 | 848 | 858 | 869 | 879 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.00% | 5.00% | 8.00% | 8.00% |
| Cost of Therapy | \$85,000 | \$85,000 | \$85,000 | \$85,000 | \$85,850 | \$86,709 | \$87,576 | \$88,451 | \$89,336 | \$90,229 | \$91,132 | \$92,043 |
| U.S. Sales | \$0.0M | \$0.0M | \$0.0M | \$14.0M | \$71.8M | \$124.7M | \$230.5M | \$243.9M | \$257.8M | \$266.3M | \$272.2M | \$278.2M |
| ROW Sales | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$42.3M | \$86.4M | \$132.5M | \$136.9M | \$143.7M | \$151.6M | \$157.3M | \$160.8M |
| Gross Margin | 0.0% | 0.0% | 0.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% |
| Cash Flows | \$0.0M | \$0.0M | \$0.0M | \$10.7M | \$86.7M | \$160.5M | \$275.9M | \$289.4M | \$305.2M | \$317.6M | \$326.4M | \$333.6M |
| Discount Rate | 10% | | | | | | | | | | | |
| NPV | \$900.9M | | | | | | | | | | | |
| Prob of Success | 60% | | | | | | | | | | | |
| | \$540.5M | | | | | | | | | | | |

| Actimab-A | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| US AML Pop >55 | 12,259 | 12,406 | 12,555 | 12,706 | 12,858 | 13,012 | 13,169 | 13,327 | 13,486 | 13,648 | 13,812 | 13,978 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.00% | 20.00% | 30.00% | 40.00% | 50.00% | 50.00% | 50.00% |
| ROW Pop >55 | 16,000 | 16,192 | 16,386 | 16,583 | 16,782 | 16,983 | 17,187 | 17,393 | 17,602 | 17,813 | 18,027 | 18,243 |
| Penetration Rate | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 10.00% | 15.00% | 20.00% | 25.00% | 30.00% |
| Cost of Therapy | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$60,000 | \$61,200 | \$62,424 | \$63,672 |
| U.S. Sales | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$78.1M | \$158.0M | \$239.9M | \$323.7M | \$417.6M | \$431.1M | \$445.0M |
| ROW Sales | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$51.6M | \$104.4M | \$158.4M | \$218.0M | \$281.3M | \$348.5M |
| Gross Margin | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% | 76.0% |
| Cash Flows | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$0.0M | \$78.1M | \$209.6M | \$344.2M | \$482.1M | \$635.7M | \$712.4M | \$793.5M |
| Discount Rate | | 12% | | | | | | | | | | |
| NPV | | | | | | | | | | | | \$1060.4M |
| Prob of Success | | 25% | | | | | | | | | | \$265.1M |

| | |
|----------------------------------|----------------|
| Combined NPV | \$805.6M |
| Current cash on hand | \$14.7M |
| Cash from options/warrants | \$28.6M |
| Fully Diluted Shares Outstanding | 40.5M |
| Price Per Share | \$20.95 |

Risks

There is no guarantee that the Company's Phase III trial for Iomab-B and the Company's Phase I/II trial for Actimab-A will show statistically significant efficacy. There is no guarantee that the Company will achieve its primary endpoint in either of its current clinical trials. However, the Company has shown very promising efficacy data in previous trials for Iomab-B. Additionally, Bismab-A already showed strong efficacy data in a Phase II clinical trial, and Actimab-A has outperformed Bismab-A in comparable trials.

ATNM's future capital needs are uncertain. ATNM is currently in clinical trials for both Iomab-B and Actimab-A. Additionally, ATNM is expected to enter into a clinical trial in the near future with Actimab-A for an additional indication. The Company will likely need to raise additional capital in the future, which may dilute existing shareholders. However, if approved, Iomab-B sales should provide cash flow to help fund some of the Company's capital needs. Also, there is the potential for ATNM to enter into licensing agreements with other companies to help offset some of its development costs.

There is no guarantee that ATNM's therapies will ultimately be economically feasible. While work to date has shown ATNM's therapies to be lower cost than the current standards of care, there is no guarantee that this will hold when manufacturing is moved into commercial production.

Revenues will ultimately depend heavily on third party reimbursements from Medicare and other third party insurance companies. Sales of ATNM's therapies will rely heavily on third party reimbursement, which is not certain. However, reimbursement momentum should be helped by the large amount of thought leaders that are endorsing the Company's therapies, along with the current lack of effective treatments for AML.

Management

Kaushik J. Dave, Ph.D, M.B.A. – President & CEO.

Dr. Dave joins Actinium Pharmaceuticals from Antares Pharmaceuticals Inc. where he was the Executive Vice President of Product Development. As part of the core leadership team at Antares, he was instrumental in setting strategy, vision, product portfolio development and business development for that company over the past several years. Dr. Dave led the clinical and regulatory approval of Anturo1™ and was also a key contributor to the change in company vision to combination products using Antares' medical device technology which resulted in a robust pipeline that included development and New Drug Application submission for Otrexup which was approved October 11, 2013. As a result of these efforts, Antares Pharma grew from a market capitalization of \$40 million to about a half billion during his tenure.

Prior to Antares, Dr. Dave was Vice President Product Development at Palatin Technologies Inc. where he obtained approval of NeutroSpec™ (a radiopharmaceutical monoclonal antibody product). Prior to Palatin, Dr. Dave was employed at Schering-Plough Inc. and Merck & Co. Inc. responsible for steering the development of several pharmaceutical product development programs. Dr. Dave received his pharmacy degree from the University of Bath, UK and a Ph.D. in Pharmaceutical Chemistry from the University of Kansas. Dr. Dave also received an M.B.A. from the Wharton School of the University of Pennsylvania.

Dragan Cicic, M.D., M.B.A. – COO & CMO.

Dragan Cicic is the COO and CMO of Actinium Pharmaceuticals, Inc. (ATNM). He joined the company in 2005 and previously held the position of the Medical Director with Actinium Pharmaceuticals, Inc. Dr. Cicic joined ATNM from the position of Project Director of QED Technologies Inc., a life sciences strategic consulting and transactional group focused on emerging biotech, pharmaceuticals and medical devices companies. Dr. Cicic prepared business and strategic plans on behalf of those clients and assisted them in raising funding. He also represented corporate and private investors in identifying acquisition and/or investment targets and negotiating, structuring and consummating deals. Prior to joining QED Technologies, Dr. Cicic was an investment banker with SG Cowen Securities.

Dr. Cicic graduated as a Medical Doctor from the School of Medicine at The Belgrade University, and received his M.B.A. from Wharton School at The University of Pennsylvania. He was also a Nieman Fellow at Harvard University.

Dennis Earle, M.S., M.B.A, P.M.P.- Senior Vice President of Clinical Operations.

Mr. Earle has more than twenty years of professional experience in clinical development and program management within the bio-pharmaceutical industry. Most recently, Mr. Earle held the position of Vice President – Clinical Operations & Project Management at Onconova Therapeutics. At Onconova, Mr. Earle assumed responsibility for the portfolio of oncology clinical studies, including both solid

tumor & hematologic indications; most notably, acute myelogenous leukemia and the global Phase 3 program in myelodysplastic syndrome. Prior to Onconova, Mr. Earle was Head of Program Management & Strategic Planning at Adolor and the Vice President of Clinical Operations & Program Management at Intercept Pharmaceuticals. From 1998 to 2006, Mr. Earle was the Executive Director, Clinical Affairs at Palatin Technologies.

Mr. Earle has received a M.B.A. from Saint Joseph's University, a M.S. in Biotechnology from Johns Hopkins University and a B.A. in Biochemistry & English from Rutgers University. Additionally, Mr. Earle is certified as a Project Management Professional (PMP) through the Project Management Institute.

David Gould, M.D. – Senior Vice President of Finance and Corporate Development.

Dr. Gould has 14 years of healthcare sector investment experience across the life sciences spectrum. Most recently, he was a Principal and Partner at Merlin Nexus, a specialized late-stage private equity firm which invested in emerging public and late-stage private biotechnology and medical device companies. There he was part of an investment team which generated consistently strong, benchmarked returns, driven in part by a disciplined focus on clinical data and unmet medical need, including oncology. Prior to that, Dr. Gould was a Vice President at Dresdner Kleinwort Capital, as part of their Global Private Equity healthcare investment team based in New York and London. He gained additional experience there in pharmaceutical equity research.

Dr. Gould received a M.D. from Jefferson Medical College, of Thomas Jefferson University in Philadelphia. He also received a M.B.A. in Finance from Stern School of Business, New York University and a B.S. in Molecular Biology from the University of Wisconsin – Madison.

Corey Sohmer, M.B.A. – Vice President of Finance and Business Development.

Mr. Sohmer has served in a variety of core finance and business development functions over the span of twelve years at three NASDAQ listed biopharmaceutical companies. Most recently, Mr. Sohmer was the Director Corporate Finance at Cyclacel Pharmaceuticals, Inc. for six years. Before joining Cyclacel, he was the Senior Director of Financial Planning and External Reporting at EpiCept Corporation and Manager of Finance and Business Development at Pharmos Corporation. He has more than 20 years of finance and accounting experience. Mr. Sohmer holds a Masters in Business Administration and a Bachelors of Science degree in Accounting from Bentley University.

Sandesh Seth, M.S., M.B.A. – Chairman of the Board

Sandesh Seth is Head of Healthcare Investment Banking at Laidlaw & Co. (UK) Ltd., a full-service investment banking and brokerage firm.

Mr. Seth has 20+ years experience in merchant and investment banking, equity research (Cowen & Co., Bear Stearns, Commonwealth Associates) and in the pharma industry (Pfizer, Warner-Lambert, SmithKline) in strategic planning, business development and R&D project management. Mr. Seth's financial services experience includes 150+ completed transactions via which \$5+ billion in capital was raised. Transactions included venture investments, private placements, IPOs, FOs, PIPEs, Convertible and High-Yield Debt. Mr. Seth was also involved with various strategic initiatives such as mergers and acquisitions, leveraged and management buy-outs, and licensing and joint ventures, including the \$100 billion merger of Pfizer and Warner-Lambert and the \$20 billion merger of Pharmacia & Upjohn with Monsanto.

Mr. Seth has an M.B.A. in Finance from New York University; an M.S. in the Pharmaceutical Sciences from the University of Oklahoma Health Center and a B.Sc. in Chemistry from Bombay University. He has published several scientific articles and was awarded the University Regents Award for Research Excellence at the University of Oklahoma. Mr. Seth was designated as Regulatory Affairs Certified (R.A.C.) by the Regulatory Affairs Professionals Society which signifies proficiency with U.S. FDA regulations.

Clinical Advisory Board

Elihu Estey, M.D.

University of Washington, Fred Hutchinson Cancer Research Center

Dr. Estey is a Professor of Hematology at the University of Washington and a Member of Fred Hutchinson Cancer Research Center. Prior to that, he was Chief of the Section of Acute Leukemia in the MD Anderson Leukemia Department, where he also held the Hubert L. and Olive Stringer Professorship in Medical Oncology.

Among his observations are that newly-diagnosed APL can be treated effectively without resort to chemotherapy and that response to anti-AML therapy may not be influenced by diagnosis (AML or high-risk MDS), a finding underlying the WHO's reclassification of AML. Together with collaborators in the Statistics Dept, Dr. Estey has also introduced new, Bayesian methodology into the design and analysis of clinical trials. Examples include (1) a phase 1-2 design that allows monitoring of both response and toxicity in early clinical trials, (2) a phase 2 design that accounts for covariates and "borrows strength", and (3) adaptive randomization.

Hagop Kantarjian, M.D.

University of Texas, M.D. Anderson Cancer Center

Dr. Kantarjian serves as Clinical Consultant of Astex Therapeutics Limited. Dr. Kantarjian serves as the Chairman of the Leukemia Department and a Professor of Medicine of the University of Texas, M.D. Anderson Cancer Center. He has been associated with M.D. Anderson Cancer Center since 1981. Dr. Kantarjian is a leading expert in the field of chronic and acute leukemia and was a key investigator in clinical trials that led to the approval of Gleevec as a treatment for chronic myeloid leukemia (CML).

Dr. Kantarjian has been a Member of the Scientific Advisory Board (SAB) of ChemGenex Pharmaceuticals Ltd. (also known as AGT Biosciences) since October 13, 2004. He served as Clinical and Scientific Advisor of ChemGenex Therapeutics, Inc. He served as Member of Scientific Advisory Board at Astex Therapeutics Limited.

He has authored and contributed to over 560 medical publications, articles and abstracts and, for his accomplishments, has received awards, including a Leukemia Society of America Scholarship from 1989 to 1994 and a Leukemia Society of America Special Fellow Scholarship from 1982 to 1983. Dr. Kantarjian received his medical degree from the American University of Beirut and is board certified in internal medicine, medical oncology, and hematology.

Joseph G. Jurcic, M.D.

Memorial Sloan Kettering Cancer Center

Dr. Joseph Jurcic is an Associate Attending Physician at Memorial Sloan Kettering Cancer Center (MSKCC) and Associate Professor of Medicine at the Weill Medical College of Cornell University. He was Acting Chief of the Leukemia Service from 2006-2010. He is the Chairman of the Actinium Pharmaceuticals Clinical Advisory Board. Dr. Jurcic is a medical oncologist and hematologist who specializes in the treatment of patients with leukemia. In particular, his research has focused on using antibodies to harness the body's immune system to kill leukemia cells and to deliver radiation treatment directly to leukemia cells.

Dr. Jurcic continues to publish extensively. He has conducted 13 clinical trials investigating antibody-based therapies of leukemia and has been the Principal Investigator on all alpha particle immunotherapy trials. Dr. Jurcic publishes extensively. He completed his residency at the Barnes Hospital, Washington University in St. Louis. Dr. Jurcic received his M.D. from the University of Pennsylvania and has Board Certifications in Internal Medicine, Medical Oncology and Hematology.

John Pagel, M.D., Ph.D.

Fred Hutchinson Cancer Research Center and Seattle Cancer Care Alliance

Dr. John Pagel is an Assistant Professor with the Department of Medicine, Division of Oncology at Fred Hutchinson Cancer Research Center and Seattle Cancer Care Alliance in Seattle, Washington. Dr. Pagel specializes in bone marrow transplant, leukemia and lymphoma. Dr. Pagel is a member of American Association for Cancer Research, American Society of Hematology and other professional and scientific associations.

He received his medical degree from Boston University School of Medicine and went on to complete his residency in internal medicine at the University of California San Francisco. Dr. Pagel obtained his Ph.D. in Microbiology and Molecular Genetics as well as his B.A. in Biology from University of California.

Alexander Perl, M.D.

The Hospital of the University of Pennsylvania

Dr. Perl received his Bachelor of Arts in psychology, cum laude from the University of Rochester in 1993 and his M.D. from the Mount Sinai School of Medicine in 1997, where he was elected to the medical honor society Alpha Omega Alpha. He then completed an internship and residency in Internal Medicine from the University of California, San Francisco followed by a Medical Oncology fellowship at the Johns Hopkins Hospital. While working in the laboratory of Donald Small, M.D., Ph.D. at Hopkins, Dr. Perl developed his research interests in targeted inhibition of signal transduction pathways in acute leukemia. Dr. Perl was subsequently recruited to the University of Pennsylvania in 2003 where he is currently an Assistant Professor of Medicine in the Division of Hematology/Oncology.

His clinical and research interests are the development of novel therapeutics in AML and he serves as a principal or co-investigator for numerous clinical trials at Penn. He is actively involved in the education of the Heme/Onc fellows and won his division's best teaching award in 2005. Dr. Perl sees acute leukemia patients in the Abramson Cancer Center and attends on the hematologic malignancies and marrow transplantation service at the Hospital of the University of Pennsylvania. An active laboratory investigator, Dr. Perl's bench research focuses on targeted disruption of the PI3 kinase/AKT/mTOR pathway in AML. He also assists the management of Penn's Leukemia and Stem Cell Core tissue bank, which is among the nation's largest single institution leukemia research repositories.

Dr. Perl has authored several publications and book chapters on acute leukemias that have been published in journals such as Blood, the Journal of Clinical Oncology, Bone Marrow Transplantation, and Leukemia and Lymphoma. Dr. Perl is the recipient of a Career Development Award from the Leukemia and Lymphoma Society. He has also received a research fellowship and training award from the Institute for Translational Medicine and Therapeutics at the University of Pennsylvania.

David Scheinberg, M.D., Ph.D.

Memorial Sloan Kettering Cancer Center

David A. Scheinberg, M.D., Ph.D. is currently Vincent Astor Chair and Chairman, Molecular Pharmacology and Chemistry Program, Sloan-Kettering Institute; Chairman, Experimental Therapeutics Center, Memorial Sloan Kettering Cancer Center. He is also Professor of Medicine and Pharmacology and Co-chair of the Pharmacology graduate program at the Weill-Cornell University Medical College and Professor in the Gerstner-Sloan Kettering Graduate School at MSKCC. From 1992 until 2003, he was Chief of the Leukemia Service at Memorial Hospital. His awards include the Doris Duke Distinguished Clinical Science Professorship, the Lucille P. Markey Scholarship, Leukemia and Lymphoma Society Translational Investigator Awards, CapCure Awards, and membership in the American Society of Clinical Investigation and the Interurban club. He is a Director of Progenics Pharmaceuticals, a public Biotech company, and Contrafect Pharmaceuticals.

Dr. Scheinberg has been working in the area of a particle immunotherapy since 1982 and has been associated with Actinium Pharmaceuticals since 1995. Actinium Pharmaceuticals Intellectual Property is based to a significant degree on patents developed by Dr. Scheinberg's lab. Dr. Scheinberg is a physician-scientist, specializing in the care of patients with leukemia and also investigating new therapeutic approaches to cancer, both in the hospital and in the laboratory. The focus of his research is on the discovery and development of novel, specific immunotherapeutic agents. This includes monoclonal antibodies that target the cell surface of cancers, targeted radiopharmaceuticals that deliver radioactive particles including alpha particles or alpha particle nanogenerators to tumor cells for selective cell kill, and therapeutic vaccines targeting the oncogene products that cause the cancers.

Seven different therapeutic agents developed by Dr. Scheinberg in the laboratory have reached human clinical trials, which include the first humanized antibodies to treat acute leukemia, the first targeted alpha therapies and the first tumor specific fusion oncogene product vaccines. His laboratory is also investigating cellular resistance mechanisms to these agents. Dr. Scheinberg has published more than 200 papers, chapters, or books in these fields.

Richard Wahl, M.D.

Johns Hopkins Medicine

Richard Wahl, M.D., is Professor of Radiology and Oncology, Director of the Division of Nuclear Medicine, Associate Director for Clinical Research, the director of Nuclear Medicine and PET as well as the Vice-Chairman for technology and new business development of the Radiology Department of Johns Hopkins Medicine.

He has performed both pre-clinical and clinical studies with radiolabeled monoclonal antibodies and is perhaps best known for his early work showing the value of monoclonal antibody fragments for imaging tumors and for his role in developing radio-immunotherapy of non-Hodgkin Lymphoma using anti CD-20 antibodies. Dr. Wahl is also well known for his work on developing PET imaging of cancer, being substantially responsible for establishing that PET imaging with FDG is useful in a wide range of cancers.

Alpha Particle History and Structure

Alpha particles are extremely powerful radioactive particles that have only recently been able to be harnessed properly in order to treat cancer. Alpha particles are approximately 7,000 times heavier and 100 times more powerful than beta particles, and the issue has been how to be able to keep the alpha particle to a designated location in the body, and not to have it spread throughout the body and harm healthy tissues and organs. The alpha particle Actinium-225 creates three additional elements as it decays, and the challenge has been to not have these elements spread and settle throughout the body. Scientists and researchers originally discovered alpha particles over 100 years ago, and have known about the potential cancer treating qualities of

alpha particles for many years. Additionally, actually being able to effectively target and hold the alpha particles at a specific site in the body has been a challenge that researchers have been trying to solve for over 15 years.

Due to the extremely high energy of alpha particles, a cancer cell can be killed with a single alpha particle; conversely, it can take hundreds or even thousands of beta particles to kill a single cancer cell. When properly controlled, alpha particles have the potential to provide superior efficacy and a superior safety profile, as compared to beta particles.

In order to effectively use alpha particles, the alpha particle must be linked to a monoclonal antibody. The monoclonal antibody tells where in the body the alpha particle should target. As additional monoclonal antibodies are developed, more targeted cancer payloads can be developed to treat different types of cancer.

The key to making this all work has been the development of chelators that allow alpha particles to be used safely. The chelator is a substance that connects to both the monoclonal antibody and the alpha particle; the chelator performs the very important task of eliminating the alpha particle from the body. On its own, Actinium-225 is extremely toxic and clears from the body very slowly, with up to 50% of a single dose remaining in the body 6 months after an injection. After much experimentation, the chelator 1,4,7,10,13,16-Hexaazocyclooctadecane-N,N',N'',N''',N''''-Hexaacetic Acid (HEHA), was determined to be the best chelator. This chelator rapidly clears Actinium-225 from the body and has low accumulation in vital organs and bone.

The above structure is now believed, at proper dose levels, to let physicians use Actinium-225 to effectively treat cancer without causing serious toxicity.

Additional Information

Legal: Thomas Slusarczyk, The Matt Law Firm

Auditor: GBH CPAs, PC

Transfer Agent: Action Stock Transfer Corp.

[Company Information](#)

About RedChip

RedChip Companies, an Inc. 5000 company, is an international small-cap research, investor relations, and media company headquartered in Orlando, Florida; with affiliate offices in San Francisco, Seoul, Hong Kong and Singapore. RedChip delivers concrete, measurable results for its clients through its extensive global network of small-cap institutional and retail investors. RedChip has developed the most comprehensive platform of products and services for small-cap companies, including: RedChip Research(TM), Traditional Investor Relations, Digital Investor Relations, Institutional and Retail Conferences, "The RedChip Money Report"(TM) television show, Shareholder Intelligence, Social Media and Blogging Services, and Webcasts. RedChip is not a FINRA member or registered broker/dealer.

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