UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended **June 30, 2017**

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15 (d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number: **000-52446**

ACTINIUM PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**74-2963609**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
275 Madison Ave, 7th Floor New York, NY	**10016**
(Address of Principal Executive Offices)	(Zip Code)

(646) 677-3870
(Registrant's Telephone Number, Including Area Code)

(Former Name, Former Address and Former Fiscal Year, if Changed Since Last Report)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

☒ Yes No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

☒ Yes No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☐
(Do not check if a smaller reporting company)		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards, provided pursuant to Section 13(a) of the Exchange Act. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

☐ Yes ☒ No

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of August 4, 2017: 80,020,573.

Actinium Pharmaceuticals, Inc.
FORM 10-Q
For quarterly period ended June 30, 2017

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PART I - FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

The accompanying consolidated financial statements have been prepared by the Company and are unaudited. In the opinion of management, all adjustments (which include only normal recurring adjustments) necessary to present fairly the financial position at June 30, 2017 and December 31, 2016, and the results of operations and cash flows for the six months ended June 30, 2017 and 2016 have been made. Certain information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America have been condensed or omitted. It is suggested that these financial statements be read in conjunction with the financial statements and notes thereto included in the Company's audited financial statements for the year ended December 31, 2016, filed with the SEC in the Company's Annual Report on Form 10-K on March 16, 2017. The results of operations for the six months ended June 30, 2017 are not necessarily indicative of the operating results for the full year.

Actinium Pharmaceuticals, Inc.
Consolidated Balance Sheets
(Unaudited)

	June 30, 2017	December 31, 2016
Assets		
Current Assets:		
Cash and cash equivalents	$ 11,456,272	$ 20,519,294
Restricted cash – current	-	34,733
Prepaid expenses and other current assets	1,009,627	1,836,451
Total Current Assets	12,465,899	22,390,478
Property and equipment, net of accumulated depreciation	70,004	88,549
Security deposit	49,859	49,859
Restricted cash	390,825	-
Total Assets	**$ 12,976,587**	**$ 22,528,886**
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable and accrued expenses	$ 3,604,579	$ 4,194,874
Accounts payable and accrued expenses - related parties	75,000	25,000
Derivative liabilities	426,442	300,683
Total Current Liabilities	4,106,021	4,520,557
Total Liabilities	4,106,021	4,520,557
Commitments and contingencies		
Stockholders' Equity:		
Preferred stock, $0.001 par value; 50,000,000 shares authorized, 0 shares issued and outstanding	-	-
Common stock, $0.001 par value; 200,000,000 shares authorized; 58,519,073 and 55,801,742 shares issued and outstanding, respectively	58,519	55,802
Additional paid-in capital	160,479,140	154,504,329
Accumulated deficit	(151,667,093)	(136,551,802)
Total Stockholders' Equity	8,870,566	18,008,329
Total Liabilities and Stockholders' Equity	**$ 12,976,587**	**$ 22,528,886**

See accompanying notes to the unaudited consolidated financial statements.

Actinium Pharmaceuticals, Inc.
Consolidated Statements of Operations
(Unaudited)

	For the Three Months Ended June 30,		For the Six Months Ended June 30,	
	2017	**2016**	**2017**	**2016**
Revenue	$ -	$ -	$ -	$ -
Operating expenses:				
Research and development, net of reimbursements	4,379,047	4,147,945	8,883,398	7,913,397
General and administrative	2,809,918	2,750,448	6,090,235	4,968,915
Depreciation expense	14,335	19,472	35,255	37,592
Total operating expenses	7,203,300	6,917,865	15,008,888	12,919,904
Loss from operations	(7,203,300)	(6,917,865)	(15,008,888)	(12,919,904)
Other income (expense):				
Interest expense	-	(1,683)	-	(4,341)
Gain (loss) on change in fair value of derivative liabilities	149,592	295,462	(106,403)	1,896,861
Total other income (expense)	149,592	293,779	(106,403)	1,892,520
Net loss	**$ (7,053,708)**	**$ (6,624,086)**	**$ (15,115,291)**	**$ (11,027,384)**
Net loss per common share – basic and diluted	$ (0.12)	$ (0.14)	$ (0.26)	$ (0.24)
Weighted average common shares outstanding – basic and diluted	58,184,534	46,470,225	57,045,036	45,362,009

See accompanying notes to the unaudited consolidated financial statements.

Actinium Pharmaceuticals, Inc.
Consolidated Statements of Cash Flows
(Unaudited)

	For the Six Months Ended June 30,	
	2017	**2016**
Cash Flows From Operating Activities:		
Net loss	$ (15,115,291)	$ (11,027,384)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	2,172,279	2,062,285
Depreciation expense	35,255	37,592
Loss (gain) on change in fair value of derivative liabilities	106,403	(1,896,861)
Changes in operating assets and liabilities:		
(Increase) decrease in:		
Prepaid expenses and other current assets	826,824	(119,262)
Increase (decrease) in:		
Accounts payable and accrued expenses-related party	50,000	60,154
Accounts payable and accrued expenses	(590,295)	(94,775)
Net Cash Used In Operating Activities	(12,514,825)	(10,978,251)
Cash Flows From Investing Activities:		
Purchase of property and equipment	(16,710)	(41,474)
Payment for security deposit	-	(49,859)
Increase of restricted cash	(356,092)	-
Net Cash Used In Investing Activities	(372,802)	(91,333)
Cash Flows From Financing Activities:		
Payments on note payable	-	(176,126)
Sales of common stock, net of offering costs	3,824,605	6,057,685
Net Cash Provided By Financing Activities	3,824,605	5,881,559
Net change in cash and cash equivalents	(9,063,022)	(5,188,025)
Cash and cash equivalents at beginning of period	20,519,294	25,643,273
Cash and cash equivalents at end of period	**$ 11,456,272**	**$ 20,455,248**
Supplemental disclosures of cash flow information:		
Cash paid for interest	$ -	$ 4,341
Cash paid for income taxes	$ -	$ -
Supplemental disclosure of non-cash investing and financing activities:		
Transfer warrant derivatives from liability to equity classification	$ -	$ 17,455
Cashless exercise of warrants	$ 4	$ -

See accompanying notes to the unaudited consolidated financial statements.

Actinium Pharmaceuticals, Inc.
Notes to Consolidated Financial Statements
(Unaudited)

Note 1 - Description of Business and Summary of Significant Accounting Policies

Nature of Business - Actinium Pharmaceuticals, Inc. (the "Company" or "Actinium") is a biopharmaceutical company developing innovative targeted therapies for patients with cancers lacking effective treatment options. Actinium's proprietary platform utilizes monoclonal antibodies to deliver cytotoxic radioisotopes directly to cells of interest, such as cancer cells or cells of the bone marrow, in order to kill those cells safely and effectively. The Company's lead product candidate, Iomab-B, consists of the radioisotope Iodine 131 (^{131}I) coupled to BC8, an anti-CD45 monoclonal antibody. Iomab-B is designed to be used, upon approval, in preparing patients for a hematopoietic stem cell transplant ("HSCT"), commonly referred to as bone marrow transplant ("BMT"). A bone marrow transplant is often the only potential cure for patients with blood-borne cancers. However, the current standard preparation for a transplant requires chemotherapy and/or total body irradiation that result in significant toxicities. The Company is currently conducting a single pivotal 150-patient, multicenter Phase 3 clinical study of Iomab-B in patients with relapsed or refractory acute myeloid leukemia ("AML") age 55 and older. The Company's second product candidate, Actimab-A, consists of the radioisotope actinium-225 (^{225}Ac) conjugated to HuM195, an anti-CD33 monoclonal antibody. Actimab-A is currently in a multicenter open-label, 53-patient Phase 2 trial for patients newly diagnosed with AML age 60 and over. In addition, Actinium is studying Actimab-M, which also consists of ^{225}Ac conjugated to HuM195, an anti-CD33 monoclonal antibody, in a Phase 1 investigator initiated clinical trial in patients with relapsed or refractory multiple myeloma. Actinium is also utilizing its alpha-particle immunotherapy ("APIT") technology platform to generate new drug candidates based on antibodies linked to the element Actinium-225 that are directed at various cancers that are blood-borne or form solid tumors. Actinium is also considering filing an application with the U.S. Food and Drug Administration ("FDA") for breakthrough therapy designation for Actimab-A and/or Iomab-B. Actinium intends to develop a number of products for different types of cancer and derive revenue from partnering relationships with large pharmaceutical companies and/or direct sales of its products in specialty markets in the United States.

In December 2015, the Company announced that the FDA cleared the Company's IND filing for Iomab-B, and that it will proceed with a pivotal, Phase 3 clinical trial. In June 2016, Actinium announced the pivotal Phase 3 clinical trial for Iomab-B was initiated and assuming that the trial meets its end points, it will form the basis for a Biologics Licensing Application ("BLA") with the FDA. The Company, in its recently approved IND filing, established an agreement with the FDA that the path to a Biologics License Application submission would include a single, pivotal Phase 3 clinical study if it is successful. The population in this two arm, randomized, controlled, multicenter trial will be refractory and relapsed AML patients over the age of 55. The trial size was set at 150 patients with 75 patients per arm. The primary endpoint in the pivotal Phase 3 trial is durable complete remission, defined as a complete remission lasting at least 6 months and a secondary endpoint that will be overall survival at one year. There are currently no effective treatments approved by the FDA for AML in this patient population and there is no defined standard of care. Iomab-B has completed several physicians sponsored clinical trials examining its potential as a conditioning regimen prior to HSCT in various blood cancers, including the Phase 1/2 study in relapsed and/or refractory AML patients. The results of these studies in almost 300 patients have demonstrated the potential for Iomab-B to create a new treatment paradigm for bone marrow transplants by: expanding the pool to ineligible patients who do not have any viable treatment options currently; enabling a shorter and safer preparatory interval for HSCT; reducing post-transplant complications; and showing a clear survival benefit including curative potential.

In September 2016, we announced that we initiated a Phase 2 clinical trial for Actimab-A. This Phase 2 clinical trial is a multicenter, open-label study that will enroll 53 patients. Patients will receive fractionated doses of Actimab-A via two injections given at approximately day 1 and day 7. The Phase 2 trial is designed to evaluate complete response rates at up to day 42 after Actimab-A administration, where complete response is defined as complete remission ("CR"), complete remission with incomplete platelet recovery (CRp) or complete remission with incomplete blood count recovery. The Phase 2 trial will screen patients for peripheral blast counts and patients with blasts above 200 blasts per μL will receive Hydroxyurea, an oral drug, to reduce their PB counts below 200 per μL. The secondary endpoint of the Phase 2 trial will be overall survival.

In February 2017, we initiated a Phase 1 investigator initiated clinical trial to study Actimab-M in multiple myeloma (MM). Multiple myeloma is a cancer of plasma cells that is currently incurable. The Phase 1 trial will enroll up to 12 patients with relapsed or refractory multiple myeloma who have positive CD33 expression. This Phase 1 study is designed as a dose escalation study intended to assess safety, establish maximum tolerable dose ("MTD") and assess efficacy. Patients will be administered Actimab-M on day 1 at an initial dose of 0.5 μCi/kg and then assessed at day 42 for safety and efficacy. The dose can be increased to 1.0 μCi/kg or reduced to 0.25 μCi/kg based on safety assessment that will evaluate dose limiting toxicities (DLTs). Patients may receive up to 8 cycles of therapy but in no event will cumulative administration exceed 4.0 μCi/kg of Actimab-M.

We have strengthened our intellectual property position with the allowance of three additional patents and we anticipate further allowances by the end of 2017. As of August 3, 2017, our patent portfolio includes: 52 issued patents, of which 10 were issued in the United States. We have an additional 14 patent applications pending approval, of which 5 are pending in the United States. Additionally, 1 provisional patent application has been filed in 2017 with the preparation of new provisional patents underway. This is part of an ongoing strategy to continue to strengthen our intellectual property position. Approximately 30% of our patents are in-licensed from third parties and the remainder are held by us. These patents cover key areas of our business, including use of the actinium-225 and other alpha emitting isotopes attached to cancer specific carriers like monoclonal antibodies, methods for manufacturing key components of our product candidates including actinium-225 the alpha emitting radioisotope and carrier antibodies, and methods for manufacturing finished product candidates for use in cancer treatment.

Basis of Presentation - Unaudited Interim Financial Information – The accompanying unaudited interim consolidated financial statements and related notes have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") for interim financial information, and in accordance with the rules and regulations of the United States Securities and Exchange Commission (the "SEC") with respect to Form 10-Q and Article 10 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by U.S. GAAP for complete financial statements. The unaudited interim consolidated financial statements furnished reflect all adjustments (consisting of normal recurring adjustments) which are, in the opinion of management, necessary for a fair statement of the results for the interim periods presented. Interim results are not necessarily indicative of the results for the full year. These unaudited interim consolidated financial statements should be read in conjunction with the audited consolidated financial statements of the Company for the year ended December 31, 2016 and notes thereto contained in the Company's annual report on Form 10-K for the year ended December 31, 2016, as filed with the SEC on March 16, 2017.

Principles of Consolidation - The consolidated financial statements include the Company's accounts and those of the Company's wholly owned subsidiaries. All significant intercompany accounts and transactions have been eliminated.

Use of Estimates in Financial Statement Presentation - The preparation of these consolidated financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents - The Company considers all highly liquid accounts with original maturities of three months or less to be cash equivalents. Balances held by the Company are typically in excess of Federal Deposit Insurance Corporation insured limits. At June 30, 2017 and December 31, 2016, all of the Company's cash was deposited in one bank.

Property and Equipment - Machinery and equipment are recorded at cost and depreciated on a straight-line basis over estimated useful lives of three years. Furniture and fixtures are recorded at cost and depreciated on a straight-line basis over estimated useful lives of three years. When assets are retired or sold, the cost and related accumulated depreciation are removed from the accounts, and any related gain or loss is reflected in operations. Repairs and maintenance expenditures are charged to operations.

Impairment of Long-Lived Assets - Management reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount may not be realizable or at a minimum annually during the fourth quarter of the year. If an evaluation is required, the estimated future undiscounted cash flows associated with the asset are compared to the asset's carrying value to determine if an impairment of such asset is necessary. The effect of any impairment would be to expense the difference between the fair value of such asset and its carrying value.

Derivatives - All derivatives are recorded at fair value on the balance sheet. Where market prices are not readily available, fair values are determined using market based pricing models incorporating readily observable market data and requiring judgment and estimates.

Fair Value of Financial Instruments - Fair value is defined as the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants. A fair value hierarchy has been established for valuation inputs that gives the highest priority to quoted prices in active markets for identical assets or liabilities and the lowest priority to unobservable inputs. The fair value hierarchy is as follows:

Level 1 Inputs - Unadjusted quoted prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date.

Level 2 Inputs - Inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly. These might include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability (such as interest rates, volatilities, prepayment speeds, credit risks, etc.) or inputs that are derived principally from or corroborated by market data by correlation or other means.

Level 3 Inputs - Unobservable inputs for determining the fair values of assets or liabilities that reflect an entity's own assumptions about the assumptions that market participants would use in pricing the assets or liabilities.

The following tables set forth assets and liabilities measured at fair value on a recurring basis by level within the fair value hierarchy as of June 30, 2017 and December 31, 2016. As required by ASC 820 "*Fair Value Measurements and Disclosures"*, financial assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. The Company's assessment of the significance of a particular input to the fair value measurement requires judgment, and may affect the valuation of fair value assets and liabilities and their placement within the fair value hierarchy levels.

	Level 1	Level 2	Level 3	Total
Derivative liabilities:				
At June 30, 2017	$ -	$ -	$ 426,442	$ 426,442
At December 31, 2016	$ -	$ -	$ 300,683	$ 300,683

Income Taxes - The Company uses the asset and liability method in accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on differences between financial reporting and income tax carrying amounts of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The Company reviews deferred tax assets for a valuation allowance based upon whether it is more likely than not that the deferred tax asset will be fully realized. A valuation allowance, if necessary, is provided against deferred tax assets, based upon management's assessment as to their realization.

Research and Development Costs - Research and development costs are expensed as incurred. Research and development reimbursements and grants are recorded by the Company as a reduction of research and development costs.

Share-Based Payments - The Company estimates the fair value of each stock option award at the grant date by using the Black-Scholes option pricing model. The fair value determined represents the cost for the award and is recognized over the vesting period during which an employee is required to provide service in exchange for the award. As share-based compensation expense is recognized based on awards ultimately expected to vest, the Company reduces the expense for estimated forfeitures based on historical forfeiture rates. Previously recognized compensation costs may be adjusted to reflect the actual forfeiture rate for the entire award at the end of the vesting period. Excess tax benefits, if any, are recognized as an addition to paid-in capital.

Earnings (Loss) Per Common Share - Basic earnings (loss) per common share is computed by dividing the net income (loss) available to common stockholders by the weighted average number of common shares outstanding during the reporting period. For the six months ended June 30, 2017 and 2016, the Company's potentially dilutive shares, which include outstanding common stock options and warrants have not been included in the computation of diluted net loss per share as the result would have been anti-dilutive.

	June 30, 2017	June 30, 2016
Options	6,988,886	5,816,583
Warrants	8,945,388	8,780,313
Total	15,934,274	14,596,896

Subsequent Events - The Company's management reviewed all material events through the date of the consolidated financial statements were issued for subsequent event disclosure consideration.

Recent Accounting Pronouncements – In February 2016, FASB issued ASU No. 2016-02 "*Leases*" (Topic 842), which creates new accounting and reporting guidelines for leasing arrangements. The new guidance requires organizations that lease assets to recognize assets and liabilities on the balance sheet related to the rights and obligations created by those leases, regardless of whether they are classified as finance or operating leases. Consistent with current guidance, the recognition, measurement, and presentation of expenses and cash flows arising from a lease primarily will depend on its classification as a finance or operating lease. The guidance also requires new disclosures to help financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. The new standard is effective for annual reporting periods beginning after December 15, 2018, including interim periods within that reporting period, with early application permitted. The new standard is to be applied using a modified retrospective approach. The Company is currently evaluating the impact of the new pronouncement on its financial statements.

Management does not believe that any recently issued, but not yet effective accounting pronouncements, when adopted, will have a material effect on the accompanying consolidated financial statements.

Note 2 - Related Party Transactions

MSKCC:

On February 11, 2002, the Company entered into a License, Development and Commercialization Agreement with Sloan-Kettering Institute of Cancer Research ("SKI"), an entity related to Memorial Sloan-Kettering Cancer Institute, Inc. ("MSKCC"). The agreement was amended in August 2006. Pursuant to the agreement, the Company licensed certain intellectual property from SKI, including critical patents with respect to the Company's core technology that also supports ongoing research and clinical development of related drug candidates. MSKCC agreed, subject to certain conditions, to utilize the funds paid for certain clinical and preclinical programs and activities related to the Company's drug development and clinical study programs, including the payment of certain costs and expenses that would otherwise have been borne by the Company.

The Company is obligated to make the following milestone payments:

Milestones	Payments
(1) filing of an New Drug Application ("NDA") or regulatory approval for each licensed product	$ 750,000
(2) upon the receipt of regulatory approval from the U.S. FDA for each licensed product	1,750,000

Under the agreement, the Company shall pay to MSKCC on a country-by-country basis a royalty of 2% of net sales of all licensed products until the later of: (1) 10 years from the first commercial sale, or (2) when the patents expire.

For each of the six months ended June 30, 2017 and 2016, the Company incurred approximately $0.1 million, for maintenance fees and research conducted by MSKCC. As of June 30, 2017 and December 31, 2016, $50,000 and $0, respectively, was due to MSKCC.

On December 21, 2015, Actinium entered into an investor rights agreement with MSKCC. Under the terms of the agreement, MSKCC has agreed to forebear from transferring or otherwise disposing of its approximately 5.7 million shares of the Company's common stock (other than pursuant to a piggyback registration as described below) until the start of the Actimab-A Phase 2 clinical study. The Company started the Actimab-A Phase 2 clinical study in September 2016. Thereafter, MSKCC was permitted to sell its shares subject to a weekly volume limitation of 150,000 shares (which limit may be increased to up to 250,000 shares per week to the extent any prior weekly allotments are not fully used) and applicable law so long as MSKCC maintains at least 25% of its current shareholding in Actinium through December 31, 2016. Actinium granted MSKCC piggyback registration rights that would be triggered in the event Actinium were to engage in a public registered offering of its shares for its own account where other shareholders are participating as selling shareholders or where such public registered offering is for the account of other selling shareholders. In addition, Actinium granted MSKCC unlimited Form S-3 registration rights with respect to its shares following December 31, 2016.

Note 3 - Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consisted of the following at June 30, 2017 and December 31, 2016:

	June 30, 2017	December 31, 2016
Prepaid insurance	$ 161,744	$ 332,809
Prepaid clinical trial expenses	634,852	1,093,441
Other prepaid expenses	213,031	410,201
Total prepaid expenses and other current assets	$ 1,009,627	$ 1,836,451

Note 4 - Property and Equipment

Property and equipment consisted of the following at June 30, 2017 and December 31, 2016:

	Lives	June 30, 2017	December 31, 2016
Lab equipment	3 years	$ 116,070	$ 116,070
Office equipment	3 years	159,643	142,933
Less: accumulated depreciation		(205,709)	(170,454)
Property and equipment, net		$ 70,004	$ 88,549

Depreciation expense for the three months ended June 30, 2017 and 2016 was $14,335 and $19,472, respectively. Depreciation expense for the six months ended June 30, 2017 and 2016 was $35,255 and $37,592, respectively.

Note 5 - Derivatives

The Company has determined that certain warrants the Company has issued contain provisions that protect holders from future issuances of the Company's common stock at prices below such warrants' respective exercise prices. These provisions could result in modification of the warrants' exercise price based on a variable that is not an input to the fair value of a "fixed-for-fixed" option as defined under FASB ASC Topic No. 815 - 40. The warrants granted in connection with the issuance of the 2012 Common Stock Offering, and the placement agent warrants contain anti-dilution provisions that provide for a reduction in the exercise price of such warrants in the event that future common stock (or securities convertible into or exercisable for common stock) is issued (or becomes contractually issuable) at a price per share (a "Lower Price") that is less than the exercise price of such warrant at the time. The amount of any such adjustment is determined in accordance with the provisions of the warrant agreement and depends upon the number of shares of common stock issued (or deemed issued) at the Lower Price and the extent to which the Lower Price is less than the exercise price of the warrant at the time.

Activities for derivative warrant instruments during the three months ended June 30, 2017 were as follows:

	Shares subject to warrants	Fair Value
Balance, December 31, 2016	1,615,260	$ 300,683
Modification of warrants	-	19,356
Change in fair value	-	106,403
Balance, June 30, 2017	1,615,260	$ 426,442

During the six months ended June 30, 2017, 9,364 warrants were exercised on a cashless basis, of which none were derivative warrants.

On March 14, 2017, the Company canceled derivative warrants to purchase 57,212 common shares of the Company, dated December 19, 2012 and issued a new warrant to purchase 57,212 common shares of the Company. See Note 7. As a result of the replacement, the Company recorded an additional expense of $19,356 for the incremental value of the derivative warrant.

The fair values of the derivative warrants were calculated using a modified binomial valuation model with the following assumptions at each balance sheet date.

	June 30, 2017	December 31, 2016
Market value of common stock on measurement date (1)	$ 1.22	$ 0.88
Adjusted exercise price	$ 2.34	$ 2.34
Risk free interest rate (2)	1.14-1.81%	0.85%
Warrant lives in years	2.0~4.6 years	2.0 years
Expected volatility (3)	73 - 82%	61 - 69%
Expected dividend yield (4)	-	-
Probability of stock offering in any period over 5 years (5)	100%	100%
Offering price (6)	$ 0.75	$ 1.25

(1) The market value of common stock at the above measurement dates is based on the Company's closing price quoted on the NYSE MKT.

(2) The risk-free interest rate was determined by management using the Treasury Bill rate as of the respective measurement date.

(3) The volatility was estimated using the historical volatilities of the Company's common stock traded in NYSE MKT market.

(4) Management determined the dividend yield to be 0% based upon its expectation that it will not pay dividends for the foreseeable future.

(5) Management determines the probability of future stock offering at each evaluation date.

(6) Represents the estimated offering price in future offerings as determined by management.

Note 6 - Commitments and Contingencies

License and Research Agreements

The Company has entered into license and research and development agreements with third parties under which the Company is obligated to make upfront payments as well as milestone and royalty payments. Notable inclusions in this category are:

a. AbbVie Biotherapeutics Corp. - The Company entered into a Product Development and Patent License Agreement with AbbVie Biotherapeutics Corp. in 2003 to secure exclusive rights to a specific antibody when conjugated with alpha emitting radioisotopes. Upon execution of the agreement, the Company made a license fee payment of $3,000,000.

The Company agreed to make milestone payments totaling $7,750,000 for the achievement of the following agreed to and contracted milestones:

Milestones	Date Met	Payments
(1) when Company initiates a Phase 1 Clinical Trial of a licensed product	July 2012	$ 750,000
(2) when Company initiates a Phase 2 Clinical Trial of a licensed product	September 2016	750,000
(3) when Company initiates a Phase 3 Clinical Trial of a licensed product	In future	1,500,000
(4) Biological License Application filing with U.S. FDA	In future	1,750,000
(5) First commercial sale	In future	1,500,000
(6) after the first $10,000,000 in net sales	In future	1,500,000
Total		$ 7,750,000

Under the agreement, the Company shall pay to AbbVie Biotherapeutics Corp. on a country-by-country basis a royalty of 12% of net sales of all licensed products until the later of: (1) 12.5 years after the first commercial sale, or (2) when the patents expire.

The Company met its first milestone in 2012 and upon reaching the milestone the Company paid AbbVie Biotherapeutics Corp. a milestone payment of $750,000 on July 24, 2012. The milestone payment for the Phase 1 Clinical Trial was recorded as research and development expense. In September 2016, the Company met its second milestone and accrued $750,000 as a research and development expense. As of June 30, 2017, the $750,000 accrual was included in the accounts payable and accrued expenses on the balance sheet.

b. MSKCC - see Note 2 - Related Party Transactions.

c. Oak Ridge National Laboratory ("ORNL") – The Company is contracted to purchase radioactive material to be used for research and development, with a renewal option at the contract end. On January 9, 2017, the Company signed a contract with ORNL to purchase $0.7 million of radioactive material. During the six months ended June 30, 2017 and 2016, the Company purchased material from ORNL of approximately $0.3 million.

d. Icon Clinical Research, LLC ("Icon") provides project management services for the study of the drug Ac-225-HuM195 (Actimab-A) used in the Company's Phase 1 and Phase 2 clinical trials. The total project was estimated to cost approximately $1.9 million and required a 12.5% down payment of the total estimated project cost. The down payment totaling $0.2 million was paid in 2007 and 2012. On August 6, 2012, October 22, 2012 and May 16, 2013, the agreement was amended to provide for additional services. The total project is now estimated at approximately $2.7 million. Icon invoices the Company when services are rendered and the Company records the related expense to research and development expense. For six months ended June 30, 2017 and 2016, the Company incurred expenses of approximately $0 and $0.3 million, respectively, related to this agreement.

e. On June 15, 2012, the Company entered into a license and sponsored research agreement with Fred Hutchinson Cancer Research Center ("FHCRC") to build upon previous and ongoing clinical trials, with BC8 (licensed antibody). FHCRC has currently completed both a Phase 1 and Phase 2 clinical trial with BC8 and the Company intends to start preparation for a pivotal trial leading to an FDA approval. The Company has been granted exclusive rights to the BC8 antibody and related master cell bank developed by FHCRC. The cost to develop the trial will range from $13.2 million to $23.5 million, depending on the trial design as required by the FDA. Under the terms of the sponsored research agreement, the Company will fund the FHCRC lab with $0.2 million per year for the first two years and $0.3 million thereafter. Payments made toward funding the lab will be credited toward royalty payments owed to FHCRC in the given year. A milestone payment of $1 million will be due to FHCRC upon FDA approval of the first drug. Upon commercial sale of the drug, royalty payments of 2% of net sales will be due to FHCRC. For the six months ended June 30, 2017 and 2016, the Company incurred expenses of approximately $44,000 and $0.4 million, respectively, related to this agreement.

f. On February 27, 2014, the Company entered into a manufacturing agreement with Goodwin Biotechnology Inc. ("Goodwin"). Goodwin oversees the current Good Manufacturing Practices ("cGMP") production of a monoclonal antibody anticipated to be used in the phase 3 clinical trial of Iomab-B. Total cost of the agreement is $6.8 million. The Company made a non-refundable payment of $0.6 million upon execution of the agreement. Periodic payments will be made upon reaching certain milestones. As of June 30, 2017, the remaining cost of the service agreement (only) is approximately $2.5 million. Goodwin bills the Company when services are rendered and the Company records the related expense to research and development costs. For each of the six months ended June 30, 2017 and 2016, the Company paid Goodwin approximately $0.3 million and $0.2 million, respectively.

As of June 30, 2017 and December 31, 2016, the Company owed Goodwin $0.1 million.

g. On February 16, 2016, the Company entered into a Contract Research Organization ("CRO") agreement with Medpace, Inc. ("Medpace"). Medpace provides project management services for the study of Iomab-B used for the intended Phase 3 clinical trial. The total project is estimated to cost approximately $7.2 million. Medpace bills the Company when services are rendered and the Company records the related expense to research and development costs. For the six months ended June 30, 2017 and 2016, the Company paid Medpace approximately $1.4 million and $1.6 million, respectively.

h. On August 4, 2016, the Company entered into a CRO agreement with Vector Oncology Solutions, LLC ("Vector"). Vector provides project management services for the study of Actimab-A used for the intended Phase 2 clinical trial. The total project is estimated to cost approximately $4.6 million. For the six months ended June 30, 2017, the Company paid Vector approximately $0.2 million.

Lease Agreements

The Company does not own any real property. On March 10, 2016, effective as of January 1, 2016, Actinium entered into an Office Space License Agreement (the "License") with Relmada Therapeutics, Inc. ("Relmada"), with whom at that time shared two common board members, for office space located at 275 Madison Avenue, 7th Floor, New York, NY 10016. On June 6, 2017, the Company and Relmada Therapeutics, Inc. ("Relmada") entered into an Assignment and Consent Agreement (the "Assignment Agreement") pursuant to which Relmada transferred its entire lease with GP 275 Owner, LLC to the Company. The lease with GP 275 Owner, LLC has a term of seven years and three months, with an annual rental rate starting at $312,660 per year for the first 4 years, and an annual rate of $341,610 for the remaining period. The Company will also be responsible for certain other costs, such as insurance, taxes, utilities, and maintenance. The Company issued a letter of credit of $390,825 to GP 275 Owner, LLC in connection with the lease and maintained a $390,825 certified deposit as collateral for the letter of credit.

On June 8, 2017, the Company also entered into an Amended and Restated License Agreement with Relmada for office space located at 275 Madison Avenue, 7th Floor, New York, NY 10016. This agreement amends and restates to license agreement entered into between the parties on March 10, 2016. Pursuant to the terms of the amendment, the Company will continue to license the furniture, fixtures, equipment and tenant improvements located in the office space (the "FFE"). The Company will pay Relmada a license fee of $7,529 per month. The Company shall have at any time during the term of this amended agreement the right to purchase the FFE. The term of the amended agreement is contemporaneous with the lease with GP 275 Owner, LLC.

In August 2016, the Company expanded its office space at 275 Madison Avenue, 6 th Floor, New York, NY 10016, for an additional $2,400 per month over a 12-month term with an automatic renewal for an additional 12-month term unless the Company provides at least 90-day notice prior to the current termination date. The current lease is in effect until August 31, 2017.

Future minimum obligations on the lease are:

For the twelve months ending June 30:	
2018	407,808
2019	405,421
2020	431,958
2021	431,958
Thereafter	503,951
Total	$ 2,181,096

Note 7 - Equity

During the six months ended June 30, 2017, the Company issued 2,633,712 shares of common stock for gross proceeds of approximately $3.9 million as part of its At-The-Market ("ATM") sales agreement with an investment bank. During the three months ended June 30, 2017, the Company issued 1,292,355 shares of common stock for gross proceeds of approximately $2.0 million as part of its ATM program.

During the six months ended June 30, 2017, the Company issued 4,234 common shares for the cashless exercise of warrants.

During the six months ended June 30, 2017, the Company issued 67,385 common shares for consulting services. The shares have a total value of $99,056 based on the Company's stock price on the grant date at $1.47 per share.

Restricted Stock

During the three months ended June 30, 2017 and 2016, the Company recorded approximately $23,000 and $0.1 million, respectively, in stock-based compensation for all of the restricted shares outstanding. During the six months ended June 30, 2017 and 2016, the Company recorded approximately $0.1 million and $0.2 million, respectively, in stock-based compensation for all of the restricted shares outstanding.

During the six months ended June 30, 2017, the Company issued 12,000 common shares for restricted shares that became fully vested. As of June 30, 2017, the Company has yet to issue 222,908 common shares for restricted shares that have vested.

Stock Options

Following is a summary of option activities for the six months ended June 30, 2017:

	Number of Units	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding, December 31, 2016	5,906,886	$ 3.52	7.90	51,704
Granted	2,537,500	1.34		
Cancelled	(1,455,500)	2.39		
Outstanding, June 30, 2017	6,988,886	2.97	6.74	361,444
Exercisable, June 30, 2017	3,413,802	3.86	4.26	246,884

On June 6, 2017, Sergio Traversa, a director, resigned from the Company and the Company entered into an agreement with Mr. Traversa. Pursuant to the agreement, all the outstanding vested options (originally expire 90 days from termination date) as well as 68,200 unvested options granted prior to December 31, 2016, shall be exercisable until the end of the term of each option grant agreement. As a result of the modification, the Company recorded an additional expense of approximately $174,000 for the incremental fair value of the options, calculated using the Black-Scholes option-pricing model. Variables used in the Black-Scholes option-pricing model include: (1) discount rate range from 0.97% to 1.39% (2) expected life of 3 months to 8.9 years, (3) expected volatility range from 45.72% to 79.81%, and (4) zero expected dividends.

During the six months ended June 30, 2017, the Company granted its employees and members of the Board of Directors 2,537,500 options to purchase the Company's common stock with an exercise price ranging from $1.03 to $1.58 per share, a term of 10 years, and a vesting period from 1 to 4 years. The options have an aggregated fair value of $2,372,750 that was calculated using the Black-Scholes option-pricing model. Variables used in the Black-Scholes option-pricing model include: (1) discount rate range from 1.87% to 2.28% (2) expected life of 6 years, (3) expected volatility range from 79.99% to 81.74%, and (4) zero expected dividends. The estimated option life was determined based on the "simplified method," giving consideration to the overall vesting period and the contractual terms of the award. This method was used because the Company does not have sufficient historical option exercise data.

During the six months ended June 30, 2017, options to purchase 1,455,500 common shares were cancelled upon the termination of employees and a board member.

The fair values of all options issued and outstanding are being amortized over their respective vesting periods. The unrecognized compensation expense at June 30, 2017 was approximately $4.9 million. During the three months ended June 30, 2017 and 2016, the Company recorded total option expense of approximately $1.0 million and $0.9 million respectively. During each of the six months ended June 30, 2017 and 2016, the Company recorded total option expense of approximately $1.9 million and $1.7 million, respectively.

Warrants

Following is a summary of warrant activities for the six months ended June 30, 2017:

	Number of Units	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding, December 31, 2016	8,964,752	3.72	1.95	1,445,786
Exercised	(9,364)	0.78	-	-
Cancelled	(10,000)	6.07	-	-
Outstanding, June 30, 2017	8,945,388	3.69	1.53	2,547,468
Exercisable, June 30, 2017	8,725,388	3.62	1.44	2,530,668

Certain warrants were issued to the Company's Executive Chairman as part of investment banking and advisory services either prior to and outside of his role as a Board Member and subsequently Executive Chairman. The Executive Chairman has refrained from exercising such warrants that are or have been in the money for most of their existing life in order to align with the long-term interests of the Company. On March 14, 2017, the Company canceled a warrant to purchase 57,212 shares of Common Stock of the Company, dated December 19, 2012, issued to its Executive Chairman and issued a new warrant to its Executive Chairman to purchase 57,212 common shares with the term of the warrant expiring on February 11, 2022. The new warrant has the same exercise price in effect as the exercise price as the old warrant but the expiration date was modified from December 19, 2017 to February 11, 2022. The Company also amended the warrant to purchase Common Stock of the Company, dated January 31, 2012, issued to its Executive Chairman and an entity affiliated with its Executive Chairman to purchase 64,746 and 99,617 common shares, respectively. Pursuant to the terms of the warrant amendments, the term of the warrants was extended to February 11, 2022 from January 31, 2019. As a result of the replacement and modification, the Company recorded an additional expense of $64,091 for the incremental fair value of the new warrants.

During the six months ended June 30, 2017, 9,364 warrants were exercised by the warrant holders on a cashless basis. The Company issued 4,234 shares of common stock as a result of these cashless exercises.

During the three months ended June 30, 2017 and 2016, the Company recorded stock-based compensation expense related to the warrants of approximately $15,000 and $43,000, respectively. During the six months ended June 30, 2017 and 2016, the Company recorded stock-based compensation expense related to the warrants of approximately $34,000 (excluding the $64,091 addition expense due to the replacement and modification) and $0.1 million, respectively.

Note 8 - Subsequent Events

On August 2, 2017, the Company completed an underwritten public offering of 21,500,000 shares of its common stock and warrants to purchase an aggregate of 18,275,000 shares of the Company's common stock at an offering price to the public of $0.75 per share and related warrant. The warrants have an exercise price of $1.05 per share and have a term of five years. The gross proceeds from this offering were approximately $16.1 million, before deducting underwriting discounts and commissions and other estimated offering expenses payable by Actinium. As of August 2, 2017, cash and cash equivalents was approximately $24 million.

Subsequent to June 30, 2017, the Company also issued 1,500 common shares to an employee for a vested grant.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION

FORWARD-LOOKING STATEMENT NOTICE

This Form 10-Q contains certain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. For this purpose, any statements contained in this Form 10-Q that are not statements of historical fact may be deemed to be forward-looking statements. Without limiting the foregoing, words such as "may," "will," "expect," "believe," "anticipate," "estimate" or "continue" or comparable terminology are intended to identify forward-looking statements. These statements by their nature involve substantial risks and uncertainties, and actual results may differ materially depending on a variety of factors, many of which are not within our control. These factors include but are not limited to economic conditions generally and in the industries in which we may participate; competition within our chosen industry, including competition from much larger competitors; technological advances and failure to successfully develop business relationships.

Description of Business

Actinium is a biopharmaceutical company developing innovative targeted therapies for patients with cancers lacking effective treatment options. Actinium's proprietary platform utilizes monoclonal antibodies to deliver cytotoxic radioisotopes directly to cells of interest, such as cancer cells or cells of the bone marrow, in order to kill those cells safely and effectively. The Company's lead product candidate, Iomab-B, consists of the radioisotope Iodine 131 (^{131}I) coupled to BC8, an anti-CD45 monoclonal antibody. Iomab-B is designed to be used, upon approval, in preparing patients for a hematopoietic stem cell transplant ("HSCT"), commonly referred to as bone marrow transplant ("BMT"). A bone marrow transplant is often the only potential cure for patients with blood-borne cancers but the current standard preparation for a transplant requires chemotherapy and/or total body irradiation that result in significant toxicities. The Company is currently conducting a single pivotal 150-patient, multicenter Phase 3 clinical study of Iomab-B in patients with relapsed or refractory acute myeloid leukemia ("AML") age 55 and older. The Company's second product candidate, Actimab-A, consists of the radioisotope actinium-225 (^{225}Ac) conjugated to HuM1-195, an anti-CD33 monoclonal antibody. Actimab-A is currently in a multicenter open-label, 53-patient Phase 2 trial for patients newly diagnosed with AML age 60 and over. In addition, Actinium is studying Actimab-M, which also consists of ^{225}Ac conjugated to HuM195, an anti-CD33 monoclonal antibody, in a Phase 1 investigator initiated clinical trial in patients with relapsed or refractory multiple myeloma. Actinium is also utilizing its alpha-particle immunotherapy ("APIT") technology platform to generate new drug candidates based on antibodies linked to the element Actinium-225 that are directed at various cancers that are blood-borne or form solid tumors. Actinium is also considering filing an application with the U.S. Food and Drug Administration ("FDA") for breakthrough therapy designation for Actimab-A and/or Iomab-B. Actinium intends to develop a number of products for different types of cancer and derive revenue from partnering relationships with large pharmaceutical companies and/or direct sales of its products in specialty markets in the United States. We are currently manufacturing the antibody HuM195, which is a component of our Actimab-A and Actimab-M drug candidates that are currently in a Phase 2 and Phase 1 clinical trial, respectively. If we are unable to manufacture the HuM195 antibody in a timely fashion we may encounter delays in our clinical trials, which may impact our competitive position with these drug candidates.

In December 2015, we announced that the FDA cleared our Investigational New Drug Application ("IND") filing for Iomab-B, and that we will proceed with a pivotal, Phase 3 clinical trial. In June 2016, we announced the pivotal Phase 3 clinical trial for Iomab-B was initiated and assuming that the trial meets its end points, it will form the basis for a Biologics Licensing Application ("BLA") with the FDA. The Company, in its recently approved IND filing, established an agreement with the FDA that the path to a Biologics License Application submission would include a single, pivotal Phase 3 clinical study if it is successful. The population in this two arm, randomized, controlled, multicenter trial will be refractory and relapsed AML patients over the age of 55. The trial size was set at 150 patients with 75 patients per arm. The primary endpoint in the pivotal Phase 3 trial is durable complete remission, defined as a complete remission lasting at least 6 months and a secondary endpoint that will be overall survival at one year. There are currently no effective treatments approved by the FDA for AML in this patient population and there is no defined standard of care. Iomab-B has completed several physicians sponsored clinical trials examining its potential as a conditioning regimen prior to HSCT in various blood cancers, including the Phase 1/2 study in relapsed and/or refractory AML patients. The results of these studies in almost 300 patients have demonstrated the potential for Iomab-B to create a new treatment paradigm for bone marrow transplants by: expanding the pool to ineligible patients who do not have any viable treatment options currently; enabling a shorter and safer preparatory interval for HSCT; reducing post-transplant complications; and showing a clear survival benefit including curative potential.

In September 2016, we announced that we initiated a Phase 2 clinical trial for Actimab-A. This Phase 2 clinical trial is a multicenter, open-label study that will enroll 53 patients. Patients will receive fractionated dose of Actimab-A via two injections given at approximately day 1 and day 7. The Phase 2 trial is designed to evaluate complete response rates at up to day 42 after Actimab-A administration, where complete response is defined as complete remission ("CR"), complete remission with incomplete platelet recovery (CRp) or complete remission with incomplete blood count recovery. The Phase 2 trial will screen patients for peripheral blast counts and patients with blasts above 200 blasts per μL will receive Hydroxyurea, an oral drug, to reduce their PB counts below 200 per μL. The secondary endpoint of the Phase 2 trial will be overall survival.

In February 2017, we initiated a Phase 1 investigator initiated clinical trial to study Actimab-M in multiple myeloma ("MM"). Multiple myeloma is a cancer of plasma cells that is currently incurable. The Phase 1 trial will enroll up to 12 patients with relapsed or refractory multiple myeloma who have positive CD33 expression. This Phase 1 study is designed as a dose escalation study intended to assess safety, establish maximum tolerable dose ("MTD") and assess efficacy. Patients will be administered Actimab-M on day 1 at an initial dose of 0.5 μCi/kg and then assessed at day 42 for safety and efficacy. The dose can be increased to 1.0 μCi/kg or reduced to 0.25 μCi/kg based on safety assessment that will evaluate dose limiting toxicities ("DLTs"). Patients may receive up to 8 cycles of therapy but in no event will cumulative administration exceed 4.0 μCi/kg of Actimab-M.

We have strengthened our intellectual property position with the allowance of three additional patents and we anticipate further allowances by the end of 2017. As of July 3, 2017, our patent portfolio includes: 52 issued patents, of which 10 were issued in the United States. We have an additional 14 patent applications pending approval, of which 5 are pending in the United States. Additionally, 1 provisional patent application has been filed in 2017 with the preparation of new provisional patents underway. This is part of an ongoing strategy to continue to strengthen our intellectual property position. Approximately 30% of our patents are in-licensed from third parties and the remainder are held by us. These patents cover key areas of our business, including use of the actinium-225 and other alpha emitting isotopes attached to cancer specific carriers like monoclonal antibodies, methods for manufacturing key components of our product candidates including actinium-225 the alpha emitting radioisotope and carrier antibodies, and methods for manufacturing finished product candidates for use in cancer treatment.

We are also developing a technology platform that utilizes Actinium-225, an alpha emitting radioisotope. Our platform technology is based on attaching the powerful alpha emitting radioisotope Actinium-225 to monoclonal antibodies (mAbs), which are molecules capable of binding specifically to cancer cells. By virtue of carrying alpha emitters, mAbs bring Actinium-225 directly to cancer cells where alpha emitters can selectively kill the targeted cell. Actinium-225 emits significant energy making it a potent against targeted cancer cells but this energy only travels extremely short distances limiting damage to healthy tissues. Due to the targeting of this energy by way of the mAbs bringing the alpha emitting isotopes directly to cancer cells, Actinium believes Actinium-225 enabled therapies will result in potentially more effective and at the same time tolerable therapies. We have licensed and own intellectual property pertaining to our technology platform that includes the methods of treating cancer and the generation of radioimmunoconjugates, which expire in 2021 and 2029, respectively. We intend to develop additional intellectual property for our technology platform.

We were incorporated under the laws of the State of Nevada on October 6, 1997.

Plan of Operation

We develop drugs for the treatment of cancer with the intent to cure or significantly improve survival of the affected patients. None of our drugs have been approved for sale in the United States or elsewhere. We have no commercial operations in sales or marketing of our products. All our product candidates are under development. In order to market and sell our products we must conduct clinical trials on patients and obtain regulatory approvals from appropriate regulatory agencies like the Food and Drug Administration ("FDA") in the United States and similar agencies elsewhere in the world.

Our products under development are monoclonal antibodies labeled with radioisotopes. We have one program with an antibody labeled with a beta emitter and several programs based on a proprietary patent protected platform technology called APIT. Our APIT technology is based on attaching actinium 225 (Ac-225) or bismuth 213 (Bi-213) alpha emitting radioisotopes to monoclonal antibodies. Alpha emitting radioisotopes are unstable chemical elements that decay by releasing alpha particles. Alpha particles can kill any cell in the immediate proximity of where they are released. Monoclonal antibodies are genetically engineered proteins that specifically target certain cells, including cancer cells. It is crucial for the success of our drug candidates to contain monoclonal antibodies that can successfully seek cancer cells and can kill them with the attached isotope while not harming nearby normal cells. We do not have technology and operational capabilities to develop and manufacture such monoclonal antibodies and we therefore rely on collaboration with third parties to gain access to such monoclonal antibodies. We have secured rights to two monoclonal antibodies, HuM195 (Lintuzumab), in 2003 through a collaborative licensing agreement with AbbVie Biotherapeutics Corp and BC8 in 2012 with the Fred Hutchinson Cancer Research Center ("FHCRC"). We expect to negotiate collaborative agreements with other potential partners that would provide us with access to additional monoclonal antibodies. Establishing and maintaining such collaborative agreements is a key to our success as a company.

Under our own sponsorship as well as activity at FHCRC, we have five product candidates in active clinical trials: Actimab-A and Actimab-M (HuM195-Ac-225), Iomab-B (BC8-I-131), BC8-Y-90 and BC8-SA. At this time, the Company is actively pursuing development of Actimab-A and Iomab-B while Actimab-M, BC8-Y-90 and BC8-SA are in physician sponsored clinical phase 1 trials at Baylor and latter two at the FHCRC. Actimab-A is a combination of the monoclonal antibody we have in-licensed, Lintuzumab (HuM195), and the alpha emitting isotope actinium 225. Actimab-A has shown promising results throughout preclinical development and an ongoing clinical trial started in 2006 in AML in the elderly. We have expanded the number of patients and number of clinical centers by commencing a new AML clinical trial which we launched in 2012. This trial targets newly diagnosed AML patients over the age of 60. In order to conduct the trial, we are engaged in funding, monitoring and quality assurance and control of the Lintuzumab antibody; procurement of actinium 225 isotope; funding, monitoring and quality assurance and control of the drug candidate Actimab-A manufacturing and organizing and monitoring clinical trials. We estimate that the direct costs to completion of both parts of the ongoing Phase 1/2 trial will be approximately $7 million. Iomab-B is a combination of the in-licensed monoclonal antibody BC8 and the beta emitting radioisotope iodine 131. This construct has been extensively tested in Phase 1 and Phase 2 clinical trials in approximately 300 patients with different blood cancer indications who were in need of HSCT. Iomab-B is used to condition the bone marrow of these patients by destroying blood cancer cells in their bone marrow and elsewhere thus allowing for a subsequent transplant containing healthy donor bone marrow stem cells. We have decided to develop this drug candidate by initially focusing on the patients over 55 with active acute myeloid leukemia in relapse and/or refractory to existing treatments. On December 17, 2015, the FDA cleared our IND filing for Iomab-B, and that we are proceeding with the pivotal, Phase 3 clinical trial. We anticipate that the Phase 3, controlled, randomized, pivotal trial will continue enrolling patients in 2017. We estimate the direct costs of such a trial to completion anticipated in 2019 will be approximately $25 million.

We have primarily management position employees and consultants who direct, organize and monitor the activities described above through contractors. Much of the in-vivo laboratory and clinical work contracted for by the Company was conducted at MSKCC in New York. We also made clinical trial arrangements with other well-known cancer centers. Our Actimab-A and Actimab-M drug candidates and its components are contract manufactured and maintained under our supervision by specialized contract manufacturers and suppliers in the United States, including IsoTex Diagnostics, Oak Ridge National Laboratory, Pacific GMP, Fischer Bioservices, BioReliance and others.

We have never generated revenue. Currently, we do not have a recurring source of revenues to cover our operating costs. For the six months ended June 30, 2017 and 2016, we incurred a net loss of approximately $15.1 million and $11.0 million, respectively. We believe that we have sufficient cash on hand to fund our operations into the first quarter of 2019.

Opportunities, Challenges and Risks

The market for drugs for cancer treatment is a large market in need of novel products, in which successful products can command multibillion dollars in annual sales. A number of large pharmaceutical and biotechnology companies regularly acquire products in development, with preference given to products in Phase 2 or later clinical trials. These transactions are typically structured to include an upfront payment that ranges from several million dollars to tens of million dollars or more and additional milestone payments tied to regulatory submissions and approvals and sales milestones. Our goal is to develop our product candidates through Phase 2 clinical trials and enter into partnership agreements with one or more large pharmaceutical and/or biotechnology companies.

We believe our future success will be heavily dependent upon our ability to successfully conduct clinical trials and preclinical development of our drug candidates. This will in turn depend on our ability to continue our collaboration with MSKCC and our Clinical Advisory Board members. In addition, we plan to continue and expand other research and clinical trial collaborations. Moreover, we will have to maintain sufficient supply of actinium 225 and successfully maintain and if and when needed replenish or obtain our reserves of monoclonal antibodies. We will have to maintain and improve manufacturing procedures we have developed for production of our drug candidates from the components that include the iodine 131 and actinium 225 isotopes, monoclonal antibodies and other materials. It is possible that despite our best efforts our clinical trials results may not meet regulatory requirements for approval. If our efforts are successful, we will be able to partner our development stage products on commercially favorable terms only if they enjoy appropriate patent coverage and/or considerable know-how and other protection that ensures market exclusivity. For that reason, we intend to continue our efforts to maintain existing and generate new intellectual property. Intellectual property is a key factor in the success of our business as well as market exclusivity.

To achieve our goal, we intend to continue to invest in research and development at high and constantly increasing rates thus incurring further losses until one or more of our products are sufficiently developed to partner them with a large pharmaceutical and/or biotechnology company.

Results of Operations – Three Months Ended June 30, 2017 Compared to the Three Months Ended June 30, 2016

The following table sets forth, for the periods indicated, data derived from our statements of operations:

	For the Three Months Ended June 30,	
	2017	**2016**
Revenues	$ -	$ -
Operating expenses:		
Research and development, net of reimbursements	4,379,047	4,147,945
General and administrative	2,809,918	2,750,448
Depreciation expense	14,335	19,472
Total operating expenses	7,203,300	6,917,865
Other income (expense):		
Interest expense	-	(1,683)
Gain on change in fair value of derivative liabilities	149,592	295,462
Total other income (expense)	149,592	293,779
Net loss	$ (7,053,708)	$ (6,624,086)

Revenues

We recorded no commercial revenues for the three months ended June 30, 2017 and 2016.

Research and Development Expense

Research and development expenses increased by approximately $0.3 million to $4.4 million for the three months ended June 30, 2017 from $4.1 million for the three months ended June 30, 2016. The increase was primarily attributable to the increase of professional fees and payroll-related expense of approximately $0.5 million. Payroll expense increased by approximately $0.2 million. The increase in payroll was mainly due to the severance payment of $283,000 to the Company's former Chief Technology Officer who resigned in May 2017. The increase of research and development expenses was partially offset by approximately $0.2 million decrease in Actimab-A and Iomab-B manufacturing costs. We expect to incur increased research and development costs in the future.

General and Administrative Expenses

Overall, total general and administrative expenses increased by approximately $60,000 from approximately $2.75 million for the three months ended June 30, 2016 to $2.81 million for the three months ended June 30, 2017. The increase was largely attributable to an increase in stock based compensation, salaries and other related payroll expenses of approximately $43,000. Increase in salaries was mainly due to severance payment of $410,000 to the Company's Chief Executive Officer who resigned in May 2017. The increase of payroll expenses was partially offset by a decrease in regular payroll expense as a result of a decrease in average headcount during the three months ended June 30, 2017 as compared to the headcount for the same period in the prior year. We expect to incur increased general and administrative costs in the future.

Other Income (Expense)

Other income for the each of the three months ended June 30, 2017 and 2016 were approximately $0.2 million and $0.3 million, respectively. Other income is mainly associated with changes in the fair value of our warrant derivative liability. The change is mainly attributable to the fluctuation of our stock price from $1.77 per share at June 30, 2016 to $1.22 per share at June 30, 2017.

Results of Operations – Six Months Ended June 30, 2017 Compared to the Six Months Ended June 30, 2016

The following table sets forth, for the periods indicated, data derived from our statements of operations:

	For the Six Months Ended June 30,	
	2017	**2016**
Revenues	$ -	$ -
Operating expenses:		
Research and development, net of reimbursements	8,883,398	7,913,397
General and administrative	6,090,235	4,968,915
Depreciation expense	35,255	37,592
Total operating expenses	15,008,888	12,919,904
Other income (expense):		
Interest expense	-	(4,341)
Gain (loss) on change in fair value of derivative liabilities	(106,403)	1,896,861
Total other income (expense)	(106,403)	1,892,520
Net loss	$ (15,115,291)	$ (11,027,384)

Revenues

We recorded no commercial revenues for the six months ended June 30, 2017 and 2016.

Research and Development Expense

Research and development expenses increased by approximately $1.0 million to $8.9 million for the six months ended June 30, 2017 from $7.9 million for the six months ended June 30, 2016. The increase was primarily attributable to the increase of professional fees and payroll expenses for approximately $1.0 million. The increase in payroll was mainly due to the severance payment of $283,000 to the Company's Chief Technology Officer who resigned in May 2017 and the increase in average headcounts of research and development personnel. In addition, Iomab-B manufacturing costs increased by approximately $0.5 million which were offset by a decrease of approximately $0.5 million in Actimab-A manufacturing costs. We expect to incur increased research and development costs in the future.

General and Administrative Expenses

Overall, total general and administrative expenses increased by approximately $1.1 million from approximately $5.0 million for the six months ended June 30, 2016 to $6.1 million for the six months ended June 30, 2017. The increase was largely attributable to the increase in salaries and stock compensation costs of approximately $650,000 and other payroll related expenses and professional fees of approximately $500,000. Increase in salaries was mainly due to severance payment of $410,000 to the Company's Chief Executive Officer who resigned in May 2017. We expect to incur increased general and administrative costs in the future.

Other Income (Expense)

Other income for the six months ended June 30, 2017 decreased by $2.0 million from a gain of $1.9 million for the six months ended June 30, 2016 to a loss of approximately $106,000 for the six months ended June 30, 2017. Other income is mainly associated with changes in the fair value of our warrant derivative liability. The change is mainly attributable to the anticipation of exercise price reset due to future offering.

Liquidity and Capital Resources

We have financed our operations primarily through sales of the Company's common stock.

We do not have any cash or cash equivalents held in financial institutions located outside of the United States as of June 30, 2017. We do not anticipate this practice will change in the future.

The following tables sets forth selected cash flow information for the periods indicated:

	For the Six Months Ended June 30,	
	2017	2016
Cash used in operating activities	$ (12,514,825)	$ (10,978,251)
Cash used in investing activities	(372,802)	(91,333)
Cash provided by financing activities	3,824,605	5,881,559
Net change in cash and cash equivalents	$ (9,063,022)	$ (5,188,025)

Net cash used in operating activities was approximately $12.5 million and $10.9 million for the six months ended June 30, 2017 and 2016, respectively. The change was mainly due to severance payments to the Chief Technology Officer and Chief Executive Officer and increased payments for professional services and clinic trials.

Net cash provided by financing activities was approximately $3.8 million and $5.9 million for the six months ended June 30, 2017 and 2016, respectively. During the six months ended June 30, 2017, we issued common stock and received net proceeds of approximately $3.8 million from the sale of our common stock through our ATM compared to approximately $6.1 million received from the March 2016 finance.

Recent Equity Offerings

On March 24, 2014, we filed a shelf registration statement on Form S-3 (the "Registration Statement") and deemed effective on April 17, 2014. This Registration Statement contained two prospectuses: (i) a base prospectus which covers the offering, issuance and sale by the Company of up to $200,000,000 of its common stock, preferred stock, warrants and/or units; and (ii) a sales agreement prospectus covering the offering, issuance and sale by us of up to a maximum aggregate offering price of $75,000,000 of its common stock that may be issued and sold under a sales agreement (the "Sales Agreement") with MLV & Co. LLC ("MLV"). During the six months ended June 30, 2017, the Company issued 2,633,712 shares of common stock for gross proceeds of $3.9 million. Since inception of this agreement through June 30, 2017, the Company issued 11,764,824 shares of common stock for gross proceeds of $26.1 million.

During the six months ended June 30, 2017, we issued 4,234 common shares for the cashless exercise of 9,364 warrants and issued 12,000 common shares for restricted shares granted.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that is material to investors.

Seasonality

We do not have a seasonal business cycle. Our operating results are generally derived evenly throughout the calendar year.

Critical Accounting Policies

Our financial statements have been prepared in accordance with accounting principles generally accepted in the United States. To prepare these consolidated financial statements, we must make estimates and assumptions that affect the reported amounts of assets and liabilities. These estimates also affect our expenses. Judgments must also be made about the disclosure of contingent liabilities. Actual results could be significantly different from these estimates. We believe that the following discussion addresses the accounting policies that are necessary to understand and evaluate our reported financial results.

Derivatives

All derivatives are recorded at fair value and recorded on the balance sheet. Fair values for securities traded in the open market and derivatives are based on quoted market prices. Where market prices are not readily available, fair values are determined using market based pricing models incorporating readily observable market data and requiring judgment and estimates.

Fair Value of Financial Instruments

Fair value is defined as the price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants. A fair value hierarchy has been established for valuation inputs that gives the highest priority to quoted prices in active markets for identical assets or liabilities and the lowest priority to unobservable inputs. The fair value hierarchy is as follows:

● Level 1 Inputs – Unadjusted quoted prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date.

● Level 2 Inputs – Inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly. These might include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability (such as interest rates, volatilities, prepayment speeds, credit risks, etc.) or inputs that are derived principally from or corroborated by market data by correlation or other means.

● Level 3 Inputs – Unobservable inputs for determining the fair values of assets or liabilities that reflect an entity's own assumptions about the assumptions that market participants would use in pricing the assets or liabilities.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development reimbursements and grants are recorded by the Company as a reduction of research and development costs.

Share-Based Payments

The Company estimates the fair value of each stock option award at the grant date by using the Black-Scholes option pricing model. The fair value determined represents the cost for the award and is recognized over the vesting period during which an employee is required to provide service in exchange for the award. As share-based compensation expense is recognized based on awards ultimately expected to vest, the Company reduces the expense for estimated forfeitures based on historical forfeiture rates. Previously recognized compensation costs may be adjusted to reflect the actual forfeiture rate for the entire award at the end of the vesting period. Excess tax benefits, if any, are recognized as an addition to paid-in capital.

Recent Accounting Pronouncements

In February 2016, FASB issued ASU No. 2016-02 "*Leases*" (topic 842), which creates new accounting and reporting guidelines for leasing arrangements. The new guidance requires organizations that lease assets to recognize assets and liabilities on the balance sheet related to the rights and obligations created by those leases, regardless of whether they are classified as finance or operating leases. Consistent with current guidance, the recognition, measurement, and presentation of expenses and cash flows arising from a lease primarily will depend on its classification as a finance or operating lease. The guidance also requires new disclosures to help financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. The new standard is effective for annual reporting periods beginning after December 15, 2018, including interim periods within that reporting period, with early application permitted. The new standard is to be applied using a modified retrospective approach. The Company is currently evaluating the impact of the new pronouncement on its financial statements.

Management does not believe that any recently issued, but not yet effective accounting pronouncements, when adopted, will have

a material effect on the accompanying consolidated financial statements.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Common Stock Price Risk

In December 2012, we issued common stock and warrants. Pursuant to ASC 815-40, we recorded the fair value of the warrants as a current liability. The fair value of the outstanding warrants is evaluated at each reporting period with any resulting change in the fair value being reflected in the condensed consolidated statements of operations. For the six months ended June 30, 2017 and 2016, we recognized the change in the value of warrants of approximately $106,000 of loss and $1.9 million of gain, respectively, on the consolidated statement of operations. Fair value of the derivative instruments will be affected by estimates of various factors that may affect the respective instrument, including our stock price, the risk-free rate of return and expected volatility in the fair value of our stock price. As the fair value of this derivative may fluctuate significantly from period to period, the resulting change in valuation may have a significant impact on our results of operations.

On March 24, 2014, we filed a shelf registration statement on Form S-3 (the "Registration Statement") that was deemed effective on April 17, 2014. This Registration Statement contained two prospectuses: (i) a base prospectus which covers the offering, issuance and sale by the Company of up to $200,000,000 of its common stock, preferred stock, warrants and/or units; and (ii) a sales agreement prospectus covering the offering, issuance and sale by us of up to a maximum aggregate offering price of $75,000,000 of its common stock that may be issued and sold under a sales agreement (the "Sales Agreement") with MLV. During the six months ended June 30, 2017, the Company issued 2,633,712 shares of common stock for gross proceeds of $3.9 million. Since inception of this agreement through June 30, 2017, the Company issued 11,764,824 shares of common stock for gross proceeds of $26.1 million.

Sales of our common stock through MLV, if any, will be made on the NYSE MKT LLC, on any other existing trading market for the common stock or to or through a market maker. Subject to the terms and conditions of the Sales Agreement, MLV will use commercially reasonable efforts to sell our common stock from time to time, based upon our instructions (including any price, time or size limits or other customary parameters or conditions we may impose). We will pay to MLV in cash, upon the sale of common stock pursuant to the Sales Agreement, an amount equal to 3.0% of the gross proceeds from the sale of common stock. We have also provided MLV with customary indemnification rights.

ITEM 4. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures. Under the supervision and with the participation of our management, including our principal executive officer and principal financial and accounting officer, we conducted an evaluation of the effectiveness, as of June 30, 2017, of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Based upon such evaluation, our principal executive officer and principal financial and accounting officer have concluded that, as of June 30, 2017, our disclosure controls and procedures were effective to provide reasonable assurance that the information we are required to disclose in our filings with the Securities and Exchange Commission, or SEC, under the Exchange Act (i) is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (ii) accumulated and communicated to our management, including our principal executive officer and principal financial and accounting officer, as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting. There were no changes in our system of internal controls over financial reporting during the period covered by this report that has materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

None.

ITEM 1A. RISK FACTORS

In analyzing our company, you should consider carefully the following risk factors, together with all of the other information included in Part I, "Item 1A. Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2016. Factors that could cause or contribute to differences in our actual results include those discussed in the following subsection, as well as those discussed above in "Management's Discussion and Analysis of Financial Condition and Results of Operations" and elsewhere throughout this Quarterly Report on Form 10-Q. Each of the following risk factors, either alone or taken together, could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our Company. The risks and uncertainties described below are not the only ones we face. Additional risks not currently known to us or other factors not perceived by us to present significant risks to our business at this time also may impair our business operations.

Risks Related to Our Business

We have generated no revenue from commercial sales to date and our future profitability is uncertain.

We have a limited operating history and our business is subject to all of the risks inherent in the establishment of a new business enterprise. Our likelihood of success must be considered in light of the problems, expenses, difficulties, complications and delays frequently encountered in connection with this development and expansion. Since we began our business, we have focused on research, development and clinical trials of product candidates, and have incurred losses since inception. As of June 30, 2017, we had an accumulated deficit of approximately $152 million. If we continue to incur operating losses and fail to become a profitable company, we may be unable to continue our operations. We expect to continue to operate at a net loss as we continue our research and development efforts, continue to conduct clinical trials and develop manufacturing, sales, marketing and distribution capabilities. There can be no assurance that the products under development by us will be approved for sale in the United States or elsewhere. Furthermore, there can be no assurance that if such products are approved they will be successfully commercialized, and the extent of our future losses and the timing of our profitability are highly uncertain.

If we fail to obtain the capital necessary to fund our operations, we will be unable to continue or complete our product development and you will likely lose your entire investment.

Although we believe we have enough working capital for operations into the first quarter of 2019, we do not currently have sufficient capital for the completion of development nor commercialization of our product candidates and we will need to continue to seek capital from time to time to continue development of our product candidates and to acquire and develop other product candidates. Our first product candidate is not expected to be commercialized, if approved, until at least 2019 and any partnering revenues that it may generate may not be sufficient to fund our ongoing operations. Our cash balance as of June 30, 2017 was approximately $11.5 million. Throughout the six months ended June 30, 2017, we raised total net proceeds of approximately $3.8 million from the sale of our common stock through our ATM. On August 2, 2017, the Company completed an underwritten public offering of 21,500,000 shares of its common stock and warrants to purchase an aggregate of 18,275,000 shares of the Company's common stock at an offering price to the public of $0.75 per share and related warrant. The warrants have an exercise price of $1.05 per share and have a term of exercise of five years. The gross proceeds from this offering are expected to be approximately $16.1 million, before deducting underwriting discounts and commissions and other estimated offering expenses payable by Actinium. After completing the August 2, 2017 underwritten public offering we have a cash balance in excess of $24 Million.

Our business or operations may change in a manner that would consume available funds more rapidly than anticipated and substantial additional funding may be required to maintain operations, fund expansion, develop new or enhanced products, acquire complementary products, business or technologies or otherwise respond to competitive pressures and opportunities, such as a change in the regulatory environment or a change in preferred cancer treatment modalities. However, we may not be able to secure funding when we need it or on favorable terms.

To raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock. We cannot assure you that we will be able to sell shares or other securities in any other offering at a price per share that is equal to or greater than the price per share paid by investors, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders.

If we cannot raise adequate funds to satisfy our capital requirements, we will have to delay, scale-back or eliminate our research and development activities, clinical studies or future operations. We may also be required to obtain funds through arrangements with collaborators, which arrangements may require us to relinquish rights to certain technologies or products that we otherwise would not consider relinquishing, including rights to future product candidates or certain major geographic markets. We may further have to license our technology to others. This could result in sharing revenues which we might otherwise have retained for ourselves. Any of these actions may harm our business, financial condition and results of operations.

The amount of capital we may need depends on many factors, including the progress, timing and scope of our product development programs; the progress, timing and scope of our preclinical studies and clinical trials; the time and cost necessary to obtain regulatory approvals; the time and cost necessary to further develop manufacturing processes and arrange for contract manufacturing; our ability to enter into and maintain collaborative, licensing and other commercial relationships; and our partners' commitment of time and resources to the development and commercialization of our products.

We have limited access to the capital markets and even if we can raise additional funding, we may be required to do so on terms that are dilutive to you.

We have limited access to the capital markets to raise capital. The capital markets have been unpredictable in the recent past for radio-immunotherapy and other oncology companies and unprofitable companies such as ours. In addition, it is generally difficult for development stage companies to raise capital under current market conditions. The amount of capital that a company such as ours is able to raise often depends on variables that are beyond our control. As a result, we may not be able to secure financing on terms attractive to us, or at all. If we are able to consummate a financing arrangement, the amount raised may not be sufficient to meet our future needs. If adequate funds are not available on acceptable terms, or at all, our business, including our technology licenses, results of operations, financial condition and our continued viability will be materially adversely affected.

If we fail to obtain or maintain necessary FDA approval for our radio-immunotherapy products, or if such approvals are delayed, we will be unable to commercially distribute and market our products.

Our products are subject to rigorous regulation by the FDA and numerous other federal, state and foreign governmental authorities. The process of seeking regulatory approval to market a radio-immunotherapy product is expensive and time-consuming and, notwithstanding the effort and expense incurred, approval is never guaranteed. If we are not successful in obtaining timely approval of Company products from the FDA, we may never be able to generate significant revenue and may be forced to cease operations. In particular, the FDA permits commercial distribution of a new radio-immunotherapy product only after a Biologics License Application (BLA) for the product has received FDA approval. The BLA process is costly, lengthy and inherently uncertain. Any BLA filed by us will have to be supported by extensive data, including, but not limited to, technical, preclinical, clinical trial, manufacturing and labeling data, to demonstrate to the FDA's satisfaction the safety and efficacy of the product for its intended use. The lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidates, which would significantly harm our business, results of operations and prospects. In addition, even if we were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may not approve the price we intend to charge for our products, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could materially harm the commercial prospects for our product candidates.

The approval process in the United States and in other countries could result in unexpected and significant costs for us and consume management's time and other resources. The FDA and other foreign regulatory agencies could ask us to supplement our submissions, collect non-clinical data, conduct additional clinical trials or engage in other time-consuming actions, or it could simply deny our applications. In addition, even if we obtain approval to market our products in the United States or in other countries, the approval could be revoked or other restrictions imposed if post-market data demonstrates safety issues or lack of effectiveness. We cannot predict with certainty how, or when, the FDA or other regulatory authorities will act. If we are unable to obtain the necessary regulatory approvals, our financial condition and cash flow may be materially adversely affected, and our ability to grow domestically and internationally may be limited. Additionally, even if we obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications that we request. The Company's products may not be approved for the specific indications that are most necessary or desirable for successful commercialization or profitability.

Our radio-immunotherapy product candidates are in the early stages of development; and we have not demonstrated that any of our products are safe and effective for any indication.

We currently have only two products in clinical development. In December 2015, the FDA cleared our IND filing for Iomab-B, and we have initiated the pivotal, Phase 3 clinical trial. We are currently conducting a Phase 3, controlled, randomized, pivotal trial. Assuming that the trial meets its end points, it will form the basis for a BLA. Additionally, there are a number of physician IND trials at the FHCRC that have been conducted or are currently ongoing at FHCRC with Iomab-B and the BC8 antibody we licensed. We have completed the Phase 1 portion of the Phase 1/2 multi- center AML trial with fractionated doses of Actimab-A under its own federal IND and have commenced the Phase 2 portion of the trial.

We cannot predict whether we will encounter problems with any of our ongoing or planned clinical trials that will cause us or regulatory authorities to delay, suspend, or discontinue clinical trials or to delay the analysis of data from ongoing clinical trials. Any of the following could delay or disrupt the clinical development of our product candidates and potentially cause our product candidates to fail to receive regulatory approval:

- conditions imposed on us by the FDA or comparable foreign authorities regarding the scope or design of our clinical trials;
- delays in receiving, or the inability to obtain, required approvals from institutional review boards (IRBs) or other reviewing entities at clinical sites selected for participation in our clinical trials;
- delays in enrolling patients into clinical trials;
- a lower than anticipated retention rate of patients in clinical trials;
- the need to repeat or discontinue clinical trials as a result of inconclusive or negative results or unforeseen complications in testing or because the results of later trials may not confirm positive results from earlier preclinical studies or clinical trials;
- inadequate supply, delays in distribution, deficient quality of, or inability to purchase or manufacture drug product, comparator drugs or other materials necessary to conduct our clinical trials;
- unfavorable FDA or other foreign regulatory inspection and review of a clinical trial site or records of any clinical or preclinical investigation;
- serious and unexpected drug-related side effects experienced by participants in our clinical trials, which may occur even if they were not observed in earlier trials or only observed in a limited number of participants;
- a finding that the trial participants are being exposed to unacceptable health risks;
- the placement by the FDA or a foreign regulatory authority of a clinical hold on a trial; or
- delays in obtaining regulatory agency authorization for the conduct of our clinical trials.

We may suspend, or the FDA or other applicable regulatory authorities may require us to suspend, clinical trials of a product candidate at any time if we or they believe the patients participating in such clinical trials, or in independent third party clinical trials for drugs based on similar technologies, are being exposed to unacceptable health risks or for other reasons.

Further, individuals involved with our clinical trials may serve as consultants to us from time to time and receive stock options or cash compensation in connection with such services. If these relationships and any related compensation to the clinical investigator carrying out the study result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized. The delay, suspension or discontinuation of any of our clinical trials, or a delay in the analysis of clinical data for our product candidates, for any of the foregoing reasons, could adversely affect our efforts to obtain regulatory approval for and to commercialize our product candidates, increase our operating expenses and have a material adverse effect on our financial results.

Clinical trials may also be delayed or terminated as a result of ambiguous or negative interim results. In addition, a clinical trial may be suspended or terminated by us, the FDA, the IRBs at the sites where the IRBs are overseeing a trial, or a data safety monitoring board, or DSMB (Data Safety Monitoring Board), overseeing the clinical trial at issue, or other regulatory authorities due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols;
- inspection of the clinical trial operations or trial sites by the FDA or other regulatory authorities resulting in the imposition of a clinical hold;
- varying interpretation of data by the FDA or similar foreign regulatory authorities;
- failure to achieve primary or secondary endpoints or other failure to demonstrate efficacy;
- unforeseen safety issues; or
- lack of adequate funding to continue the clinical trial.

Additionally, changes in regulatory requirements and guidance may occur and we may need to amend clinical trial protocols to reflect these changes. Amendments may require us to resubmit our clinical trial protocols to IRBs for reexamination, which may impact the cost, timing or successful completion of a clinical trial.

In addition, neither we nor any relevant collaborative partner(s) has yet undertaken any clinical assessment or investigation of Company's radio-immunotherapy product candidates for other indications, including colon cancer or prostate cancer. Significant further investment may be required to acquire antibody rights and to undertake necessary research and continued development. Further laboratory and specific clinical testing will be required prior to regulatory approval of any product candidates. Adverse or inconclusive results from pre-clinical testing or clinical trials of product candidates may substantially delay, or halt entirely, any further development of one or more of our products. The projected timetables for continued development of the technologies and related product candidates by us may otherwise be subject to delay or suspension.

Modifications to our product candidates may require federal approvals.

The BLA application is the vehicle through which the company may formally propose that the FDA approve a new pharmaceutical for sale and marketing in the United States. Once a particular product candidate receives FDA approval, expanded uses or uses in new indications of our products may require additional human clinical trials and new regulatory approvals, including additional IND and BLA submissions and premarket approvals before we can begin clinical development, and/or prior to marketing and sales. If the FDA requires new approvals for a particular use or indication, we may be required to conduct additional clinical studies, which would require additional expenditures and harm our operating results. If the products are already being used for these new indications, we may also be subject to significant enforcement actions.

Conducting clinical trials and obtaining approvals can be a time-consuming process, and delays in obtaining required future approvals could adversely affect our ability to introduce new or enhanced products in a timely manner, which in turn would harm our future growth.

There is no guarantee that the FDA will approve BLAs for our product candidates and failure to obtain necessary approvals for our product candidates would adversely affect our ability to grow our business.

In June 2012, we acquired rights to BC8 (Iomab), a clinical stage monoclonal antibody with safety and efficacy data in more than 300 patients in need of HSCT. Iomab-B is our product candidate that links Iodine-131 to the BC8 antibody that is being studied in an ongoing Phase 3 pivotal trial. Product candidates utilizing this antibody would require BLA approval before they can be marketed in the United States. We have recently commenced the Phase 2 portion of a multi-center Phase 1/2 clinical trial for our product candidate, Actimab-A, in AML and in the future expect to submit a BLA to the FDA for approval of this product. Actimab-A consists of the anti-CD33 antibody lintuzumab linked with the isotope actinium-225. This product candidate is also the subject of an ongoing human safety trial being conducted under a physician IND at MSKCC. Product candidates utilizing this antibody would require BLA approval before they can be marketed in the United States. We are in the early stages of evaluating other product candidates consisting of conjugates of Ac-225 with human or humanized antibodies for pre-clinical and clinical development in other types of cancer. The FDA may not approve these products for the indications that are necessary or desirable for successful commercialization. Indeed, the FDA may fail to approve any BLA we submit for new product candidates or for new intended uses or indications for approved products or future product candidates. Failure to obtain FDA approval for our products in the proposed indications would have an adverse effect on our ability to expand our business.

Clinical trials necessary to support approval of BLAs for our product candidates will be time consuming and expensive. Delays or failures in our clinical trials may prevent us from commercializing our product candidates and will adversely affect our business, operating results and prospects and could cause us to cease operations.

Initiating and completing clinical trials necessary to support FDA approval of a BLA for Iomab-B, Actimab-A and other product candidates, is a time-consuming and expensive process, and the outcome is inherently uncertain. Moreover, the results of early clinical trials are not necessarily predictive of future results, and any product candidate we advance into clinical trials may not have favorable results in later clinical trials. We have worked with the FDA to develop a clinical trial designed to test the safety and efficacy of Iomab-B in patients with relapsed or refractory AML who are age 55 and above prior to a HSCT. This trial is designed to support a BLA filing for marketing approval by the FDA, pending results from the trial. We have also worked with the FDA to develop a clinical trial designed to test the initial safety and efficacy of Actimab-A in newly diagnosed AML patients over the age of 60, and on October 6, 2008, and January 5, 2009, we submitted IND amendments to the FDA for the conduct of a multi-center Phase 1/2 clinical trial for treatment of AML. Subsequent to the completion of the Phase 1 portion of the Phase 1/2 clinical trial we submitted protocol amendments to the FDA in August of 2016, which were agreed upon in September of 2016. The Phase 2 portion of the trial is now underway with the purpose of examining the use of Actimab-A in AML patients who are not eligible for approved forms of treatment with curative intent. The trial is not designed to support marketing approval for the product candidate, and one or more additional trials will have to be conducted in the future before we file a BLA. In addition, there can be no assurance that the data generated during the trial will meet our chosen safety and effectiveness endpoints or otherwise produce results that will eventually support the filing or approval of a BLA. Even if the data from this trial are favorable, these data may not be predictive of the results of any future clinical trials.

The issued patents, which are licensed by us for the HuM195 antibody, our acute myeloid leukemia targeting antibody, may expire before we have commercialized Actimab-A.

The humanized antibody which we use in the conjugated Actimab-A product candidate is covered by the claims of issued patents that we license from Facet Biotech Corporation, a wholly-owned subsidiary of AbbVie Laboratories. After these patents expire, others may be eventually able to use an antibody with the same sequence, and we will then need to rely on additional patent protection covering alpha particle drug products comprising actinium 225. Any competing product based on the HuM195 antibody is likely to require several years of development before achieving our product candidate's current status and may be subject to significant regulatory hurdles, but is nevertheless a possibility that can affect the Company's business in the future.

Additionally, because we expect that certain of these patents will expire prior to commercialization of Actimab-A, we expect that in order to attract a commercialization partner for that product candidate, we may need to reach an agreement with AbbVie to reduce the milestone payments and royalties currently required to be paid under our license agreement for HuM195. There can be no assurance that the parties will be able to agree on an amendment to the terms of the license. Failure to reach such an agreement could materially adversely affect our ability to find a commercialization partner for Actimab-A which may materially harm our business.

Iomab-B is not patent protected.

Neither the antibody portion nor the composition of matter as a whole for the conjugated Iomab product candidate is covered by the claims of any issued or pending patents. Accordingly, there are no patents that would prevent others from using an antibody with the same antibody sequence in any drug product (e.g., those comprising iodine 131 or alpha particle emitters). Any competing product based on the antibody used in Iomab-B is likely to require several years of development before achieving our product candidate's current status and may be subject to significant regulatory hurdles, but is nevertheless a possibility that could negatively impact the Company's business in the future.

We may be unable to obtain a sufficient supply of Ac-225 medical grade isotope in order to continue clinical trials and to allow for the manufacture of commercial quantities of Actimab-A, Actimab-M and any other Ac-225 based drug candidates that we may develop.

There are limited quantities of Ac-225 available today. The existing supplier of Ac-225 to us is the ORNL, which is a science and energy national laboratory in the Department of Energy system. ORNL manufactures Ac-225 by eluting it from its supply of Thorium-229. Although this has proven to be a very reliable source of production for a number of years, it is limited by the quantity of Thorium-229 at ORNL. We believe that the current approximate maximum of Ac-225 production from this source is sufficient for approximately 1,000–2,000 patient treatments per year. Since our needs are significantly below that amount at this time, and will continue to be below that prior to commercializing a product with a potential of selling more than 2,000 patient doses per year. We believe that this supply will be sufficient for completion of clinical trials and early commercialization. To secure supplies beyond this amount, we have developed what we believe to be a scalable cost-effective process for manufacturing Ac-225 in a cyclotron at an estimated cost in excess of $5 million. This work has been conducted at Technical University Munich (TUM) in Germany. We are now in possession of preparing detailed descriptions of all the developed manufacturing procedures and securing rights to all relevant patent applications and other intellectual property. However, we do not currently have access to a commercial cyclotron capable of producing medical grade Ac-225. Although beam time on such cyclotrons is commercially available, we do not currently have a relationship with any entity that owns or controls a suitable cyclotron. We have identified possible sources and estimate that we could secure the necessary beam time when needed at a cost of approximately $2 million per year. Our contract for supply of this isotope from ORNL must be renewed yearly, and the current contract extends through the end of 2017. While we expect this contract will be renewed at the end of its term, however, there can be no assurance that ORNL will renew the contract or that the United States Department of Energy will not change its policies that allow for the sale of isotope to us. Failure to acquire sufficient quantities of medical grade Ac-225 would make it impossible to effectively complete clinical trials and to commercialize Actimab-A, Actimab-M and any other Ac-225 based drug candidates that we may develop and would materially harm our business.

Conducting successful clinical studies may require the enrollment of large numbers of patients, and suitable patients may be difficult to identify and recruit.

Patient enrollment in clinical trials and completion of patient participation and follow-up depends on many factors, including the size of the patient population; the nature of the trial protocol; the availability of approved effective treatments for the relevant disease; competition from other clinical trial programs for similar indications; the attractiveness of, or the discomforts and risks associated with, the treatments received by enrolled subjects; the availability of appropriate clinical trial investigators; support staff; and proximity of patients to clinical sites and ability to comply with the eligibility and exclusion criteria for participation in the clinical trial and patient compliance. For example, patients may be discouraged from enrolling in our clinical trials if the trial protocol requires them to undergo extensive post-treatment procedures or follow-up to assess the safety and effectiveness of our product candidates or if they determine that the treatments received under the trial protocols are not attractive or involve unacceptable risks or discomforts. Patients may also not participate in our clinical trials if they choose to participate in contemporaneous clinical trials of competitive product candidates. In addition, patients participating in refractory AML clinical trials are seriously and often terminally ill and therefore may not complete the clinical trial due to reasons including comorbid conditions or occurrence of adverse medical events related or unrelated to the investigational products, or death.

Development of sufficient and appropriate clinical protocols to demonstrate safety and efficacy are required and we may not adequately develop such protocols to support approval.

The FDA may require us to submit data on a greater number of patients than we originally anticipated and/or for a longer follow-up period or change the data collection requirements or data analysis applicable to our clinical trials. It may also require additional data on certain categories of patients, should it emerge during the conduct of our clinical trials that certain categories of patients are likely to be affected in different and/or additional manners than the rest of the patient population. In addition to FDA requirements, our clinical trials require the approval of the IRB at each site selected. We have submitted our clinical trial protocol for our current Actimab-A clinical trial to the IRBs at participating sites for approval and we have thus far obtained approval from ten IRBs. Our clinical trial protocols have not been rejected by any IRB to date.

FDA may take actions that would prolong, delay, suspend, or terminate clinical trials of our product candidates, which may delay or prevent us from commercializing our product candidates on a timely basis, causing us to incur additional costs and delay our receipt of any revenue from potential product sales.

There can be no assurance that the data generated in our clinical trials will be acceptable to FDA or that if future modifications during the trial are necessary, that any such modifications will be acceptable to FDA. Certain modifications to a clinical trial protocol made during the course of the clinical trial have to be submitted to the FDA. This could result in the delay or halt of a clinical trial while the modification is evaluated. In addition, depending on the quantity and nature of the changes made, FDA could take the position that some or all of the data generated by the clinical trial is not usable because the same protocol was not used throughout the trial. This might require the enrollment of additional subjects, which could result in the extension of the clinical trial and the FDA delaying approval of a product candidate. If the FDA believes that its prior approval is required for a particular modification, it can delay or halt a clinical trial while it evaluates additional information regarding the change.

Serious injury or death resulting from a failure of one of our product candidates during current or future clinical trials could also result in the FDA delaying our clinical trials or denying or delaying approval of a product candidate.

The Phase 1 portion of the ongoing Phase 1/2 clinical trial for Actimab-A being conducted at seven clinical centers in the United States (MSKCC, MD Anderson Cancer Center, Fred Hutchinson Cancer Research Center, Johns Hopkins Medicine, University of Pennsylvania Health System, Baylor Summons Cancer Center and Columbia University Medical Center) was designed to establish the maximum tolerated dose of the product. As the Company expected, patients receiving highest dose of the drug administered in the trial had prolonged bone marrow suppression which could lead to fatal infections and other severe consequences. Consequently, the dose levels of our drug in that trial were reduced as we continue our work on establishing maximum tolerated dose.

Even though an adverse event may not be the result of our product candidate, the FDA or an IRB could delay or halt a clinical trial for an indefinite period of time while an adverse event is reviewed, and likely would do so in the event of multiple such events.

Any delay or termination of our current or future clinical trials as a result of the risks summarized above, including delays in obtaining or maintaining required approvals from IRBs, delays in patient enrollment, the failure of patients to continue to participate in a clinical trial, and delays or termination of clinical trials as a result of protocol modifications or adverse events during the trials, may cause an increase in costs and delays in the filing of any submissions with the FDA, delay the approval and commercialization of our product candidates or result in the failure of the clinical trial, which could adversely affect our business, operating results and prospects. Lengthy delays in the completion of our Actimab-A clinical trials would adversely affect our business and prospects and could cause us to cease operations.

If the third parties on which we rely to conduct our clinical trials and to assist us with pre-clinical development do not perform as contractually required or expected, or fail to comply with applicable regulations and standards, we may not be able to obtain regulatory approval for or commercialize our product candidates.

We do not have the ability to independently conduct our pre-clinical and clinical trials for our product candidates and we must rely on third parties, such as contract research organizations, medical institutions, clinical investigators and contract laboratories to conduct such trials. Our reliance on these third parties for clinical development activities results in reduced control over these activities. Moreover, the FDA requires us to comply with regulations and standards, commonly referred to as GCPs (good clinical practices), for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the trial participants are adequately protected. Our reliance on third parties does not relieve us of these responsibilities and requirements. If we or any of our third-party contractors fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials complies with GCP regulations. In addition, our clinical trials must be conducted with product produced under current good manufacturing practice, or cGMP, regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

To date, we believe our consultants, contract research organizations and other similar entities with which we are working have performed well; however, if these third parties do not successfully carry out their contractual duties, meet expected deadlines, or comply with applicable regulations, we may be required to replace them. Although we believe that there are a number of other third-party contractors we could engage to continue these activities, we may not be able to enter into arrangements with alternative third-party contractors or to do so on commercially reasonable terms, which may result in a delay of our planned clinical trials. Accordingly, we may be delayed in obtaining regulatory approvals for our product candidates and may be delayed in our efforts to successfully develop our product candidates.

In addition, our third-party contractors are not our employees, and except for remedies available to us under our agreements with such third-party contractors, we cannot control whether or not they devote sufficient time and resources to our ongoing clinical, nonclinical and preclinical programs. If these third parties do not successfully carry out their contractual duties or regulatory obligations or meet expected deadlines, if these third parties need to be replaced, or if the quality or accuracy of the data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for other reasons, our pre-clinical development activities or clinical trials may be extended, delayed, suspended or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize, our product candidates on a timely basis, if at all, and our business, operating results and prospects may be adversely affected. Furthermore, our third-party clinical trial investigators may be delayed in conducting our clinical trials for reasons outside of their control.

The future results of our current or future clinical trials may not support our product candidate claims or may result in the discovery of unexpected adverse side effects.

Even if our clinical trials are completed as planned, we cannot be certain that their results will support our product candidate claims or that the FDA or foreign authorities will agree with our conclusions regarding them. Success in pre-clinical studies and early clinical trials does not ensure that later clinical trials will be successful, and we cannot be sure that the later trials will replicate the results of prior trials and pre-clinical studies. The clinical trial process may fail to demonstrate that our product candidates are safe and effective for the proposed indicated uses. If FDA concludes that the clinical trials for Iomab-B, Actimab-A, or any other product candidate for which we might seek approval, have failed to demonstrate safety and effectiveness, we would not receive FDA approval to market that product candidate in the United States for the indications sought. In addition, such an outcome could cause us to abandon the product candidate and might delay development of others. Any delay or termination of our clinical trials will delay or preclude the filing of any submissions with the FDA and, ultimately, our ability to commercialize our product candidates and generate revenues. It is also possible that patients enrolled in clinical trials will experience adverse side effects that are not currently part of a product candidate's profile. In addition, our clinical trials for Actimab-A involve a relatively small patient population. Because of the small sample size, their results may not be indicative of future results.

Our product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

Our product candidates are regulated by the FDA as biologic products and we intend to seek approval for these products pursuant to the BLA pathway. The Biologics Price Competition and Innovation Act of 2009, or BPCIA, created an abbreviated pathway for the approval of biosimilar and interchangeable biologic products. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an existing brand product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product was approved under a BLA. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biologic products.

Iomab-B, Actimab-A and future product candidates may never achieve market acceptance.

Iomab-B, Actimab-A and future product candidates that we may develop or gain market acceptance among physicians, patients and the medical community. The degree of market acceptance of any of product will depend on a number of factors, including the actual and perceived effectiveness and reliability of the product; the results of any long-term clinical trials relating to use of the product; the availability, relative cost and perceived advantages and disadvantages of alternative technologies; the degree to which treatments using the product are approved for reimbursement by public and private insurers; the strength of our marketing and distribution infrastructure; and the level of education and awareness among physicians and hospitals concerning the product.

Failure of Iomab-B, Actimab-A or any of our other product candidates to significantly penetrate current or new markets would negatively impact our business financial condition and results of operations**.**

To be commercially successful, physicians must be persuaded that using our product candidates for treatment of AML and other cancers, if approved for those indications, are effective alternatives to existing therapies and treatments.

We believe that oncologists and other physicians will not widely adopt a product candidate unless they determine, based on experience, clinical data, and published peer-reviewed journal articles, that the use of that product candidate provides an effective alternative to other means of treating specific cancers. Patient studies or clinical experience may indicate that treatment with our product candidates does not provide patients with sufficient benefits in extension of life or quality of life. We believe that recommendations and support for the use of each product candidate from influential physicians will be essential for widespread market acceptance. Our product candidates are still in the development stage and it is premature to attempt to gain support from physicians at this time. We can provide no assurance that such support will ever be obtained. If our product candidates do not receive such support from these physicians and from long-term data, physicians may not use or continue to use, and hospitals may not purchase or continue to purchase, them.

Both before and after marketing approval, our product candidates are subject to ongoing regulatory requirements and continued regulatory review, and if we fail to comply with these continuing regulatory requirements, we could be subject to a variety of sanctions and the sale of any approved products could be suspended.

Both before and after regulatory approval to market a particular product candidate, the manufacturing, labeling, packaging, adverse event reporting, storage, advertising, promotion, distribution and record keeping related to the product are subject to extensive, ongoing regulatory requirements enforced by FDA and other similar regulatory bodies. Additionally, because our product candidates include radio-active isotopes, they will be subject to additional regulation and oversight from the United States Nuclear Regulatory Commission (NRC) and similar bodies in other jurisdictions. The FDA regulatory requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMP requirements and GCP requirements for any clinical trials that we conduct post-approval. Any regulatory approvals that we receive for our product candidates may also be subject to limitations on the approved indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase IV clinical trials, and surveillance to monitor the safety and efficacy of the product candidate. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with the regulatory requirements of the FDA and other applicable U.S. and foreign regulatory authorities could subject us to administrative or judicially imposed sanctions, including:

- restrictions on the marketing of our products or their manufacturing processes;
- warning letters;
- civil or criminal penalties;
- fines;
- injunctions;
- product seizures or detentions;
- import or export bans;
- voluntary or mandatory product recalls and related publicity requirements;
- suspension or withdrawal of regulatory approvals;
- total or partial suspension of production; and
- refusal to approve pending applications for marketing approval of new products or supplements to approved applications.

The FDA's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, which would adversely affect our business, prospects and ability to achieve or sustain profitability.

Even if regulatory approval of a product candidate is granted, such approval may be subject to limitations on the intended uses for which a product may be marketed and reduce the potential to successfully commercialize that product and generate revenue from that product. If the FDA determines that the product promotional materials, labeling, training or other marketing or educational activities constitute promotion of an unapproved use, it could request that we or our commercialization partners cease or modify our training or promotional materials or subject us to regulatory enforcement actions. It is also possible that other federal, state or foreign enforcement authorities might take action if they consider such training or other promotional materials to constitute promotion of an unapproved use, which could result in significant fines or penalties under other statutory authorities, such as laws prohibiting false claims for reimbursement.

Our revenue stream will depend upon third party coverage and reimbursement of our product candidates, if approved.

The commercial success of our product candidates in both domestic and international markets will be substantially dependent on whether third-party coverage and reimbursement is available for patients that use our products. However, the availability of insurance coverage and reimbursement for newly approved cancer therapies is uncertain, and therefore, third-party coverage may be particularly difficult to obtain even if our products are approved by the FDA as safe and efficacious. Patients using existing approved therapies are generally reimbursed all or part of the product cost by Medicare or other third-party payors. Medicare, Medicaid, health maintenance organizations and other third-party payors are increasingly attempting to contain healthcare costs by limiting both coverage and the level of reimbursement of new drugs, and, as a result, they may not cover or provide adequate payment for these products. Submission of applications for reimbursement approval generally does not occur prior to the filing of a BLA for that product and may not be granted until many months after BLA approval. In order to obtain coverage and reimbursement for these products, we or our commercialization partners may have to agree to a net sales price lower than the net sales price we might charge in other sales channels. The continuing efforts of government and third-party payors to contain or reduce the costs of healthcare may limit our revenue. Initial dependence on the commercial success of our products may make our revenues particularly susceptible to any cost containment or reduction efforts.

We may become subject to litigation brought by third-party service providers, consultants or former employees.

In our normal course of business, we may enter into contracts with third-party service providers, consultants, contract research organizations, contract sales organizations, commercial partners, universities, governmental agencies, not-for-profit organizations, and employees. If we fail to satisfy the terms of these contracts or the party to the contract believes we violated or failed to satisfy the terms of an agreement, litigation or other dispute resolution, proceedings may be initiated against us.

The outcomes of litigation or other dispute resolutions initiated against us are uncertain. Litigation or other proceedings may consume a substantial portion of our financial resources and the efforts of our personnel. The party that initiates litigation against us may be able to sustain the costs of such litigation more effectively than we can because of their substantially greater financial and personnel resources. Litigation may also absorb significant time of management leading to an adverse effect on company performance.

We have no manufacturing capacity and depend on third-party manufacturers to produce our pre-clinical and clinical trial drug supplies.

We do not currently operate manufacturing facilities for pre-clinical or clinical production of any of our product candidates. We lack experience in drug manufacturing, and we lack the resources and the capabilities to manufacture any of our product candidates on a clinical or commercial scale. As a result, we rely on third-party manufacturers to supply, store, and distribute pre-clinical and clinical supply of our product candidates, and plan to continue to do so for the foreseeable future. Any performance failure on the part of our existing or future manufacturers could delay clinical development or regulatory approval of our product candidates or commercialization of any approved products, producing additional losses and depriving us of potential product revenue. We are currently manufacturing the antibody HuM195, which is a component of our Actimab-A and Actimab-M drug candidates that are currently in a Phase 2 and Phase 1 clinical trial, respectively. At this time, we are undertaking release testing of a new batch of HuM195 antibody. If we are unable to successfully release the manufactured batch of the HuM195 antibody in a timely fashion we may encounter delays in our clinical trials. Inability to secure continued clinical supply of HuM195 antibody may impact our competitive position with these drug candidates as manufacturing another batch would require additional resources and time.

Our product candidates require precise, high quality manufacturing. Failure by our contract manufacturer to achieve and maintain high manufacturing standards could result in patient injury or death, product recalls or withdrawals, delays or failures in testing or delivery, cost overruns, or other problems that could seriously hurt our business. Contract manufacturers may encounter difficulties involving production yields, quality control, and quality assurance. These manufacturers are subject to ongoing periodic and unannounced inspections by the FDA and corresponding state and foreign agencies to ensure strict compliance with cGMPs and other applicable government regulations and corresponding foreign standards; however, we do not have control over third-party manufacturers' compliance with these regulations and standards.

Furthermore, these third-party contractors, whether foreign or domestic, may experience regulatory compliance difficulty, mechanical shut downs, employee strikes, or any other unforeseeable acts that may delay or limit production, which could leave our commercial partners with inadequate supplies of product to sell, especially when regulatory requirements or customer demand necessitate the need for additional product supplies. Our inability to adequately establish, supervise and conduct (either ourselves or through third parties) all aspects of the formulation and manufacturing processes, and the inability of third party manufacturers to consistently supply quality product when required would have a material adverse effect on our ability to commercialize and sell our products. We have faced delays and risks associated with reliance on key third party manufacturers in the past and may be faced with such delays and risks in the future. Any future manufacturing interruptions or related supply issues could have an adverse effect on our company, including delays in clinical trials, which may result in claims by or against us or our partners for breach of contract.

If a contract manufacturer cannot perform as agreed, we may be required to replace it. We may incur added costs and delays in identifying and qualifying replacements because the FDA must approve any replacement manufacturer prior to manufacturing our product candidates. Such approval would require new testing and compliance inspections. In addition, a new manufacturer would have to be educated in, or develop substantially equivalent processes for, production of our product candidates after receipt of FDA approval.

We anticipate continued reliance on third parties for manufacturing and marketing, if we are successful in obtaining marketing approval from the FDA and other regulatory agencies for any of our product candidates. If we are not able to secure favorable arrangements with such third parties, our business and financial condition would be harmed, and our commercialization of any of our product candidates may be halted, delayed or made less profitable if those third parties fail to obtain such approvals, fail to provide us with sufficient quantities of product or fail to do so at acceptable quality levels or prices.

To date, our product candidates have been manufactured in small quantities for preclinical and clinical testing by third-party manufacturers. If the FDA or other regulatory agencies approve any of our product candidates for commercial sale, we expect that we would continue to rely, at least initially, on third-party specialized manufacturers to produce commercial quantities of approved products. These manufacturers may not be able to successfully increase the manufacturing capacity for any approved product in a timely or economic manner, or at all. Significant scale-up of manufacturing may require additional validation studies, which the FDA must review and approve. If third party manufacturers are unable to successfully increase the manufacturing capacity for a product candidate, or we are unable to establish our own manufacturing capabilities, the commercial launch of any approved products may be delayed or there may be a shortage in supply, which in turn could have a material adverse effect on our business.

In addition, the facilities used by our contract manufacturers to manufacture our product candidates must be approved by the FDA pursuant to inspections that will be conducted after we submit a BLA to the FDA. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with cGMPs. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or other regulatory authorities, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

We also intend to partner with larger pharmaceutical companies for the commercialization of any of our product candidates that are approved. In connection with our efforts to commercialize our product candidates, we will seek to secure favorable arrangements with third parties to distribute, promote, market and sell them. If we are not able to secure favorable commercial terms or arrangements with third parties for distribution, marketing, promotion and sales of our product candidates, we may have to retain promotional and marketing rights and seek to develop the commercial resources necessary to promote or co-promote or co-market certain or all of our product candidates to the appropriate channels of distribution in order to reach the specific medical market that we are targeting. We may not be able to enter into any partnering arrangements on this or any other basis. If we are not able to secure favorable partnering arrangements, or are unable to develop the appropriate resources necessary for the commercialization of our product candidates, our business and financial condition could be harmed. In addition, we will have to hire additional employees or consultants, since our current employees have limited experience in these areas. Sufficient employees with relevant skills may not be available to us. Any increase in the number of our employees would increase our expense level, and could have an adverse effect on our financial position.

In addition, we, or our potential commercial partners, may not successfully introduce our product candidates or they may not achieve acceptance by patients, health care providers and insurance companies. Further, it is possible that we may not be able to secure arrangements to manufacture, market, distribute, promote and sell our product candidates at favorable commercial terms that would permit us to make a profit. To the extent that corporate partners conduct clinical trials, we may not be able to control the design and conduct of these clinical trials.

We may have conflicts with our partners that could delay or prevent the development or commercialization of our product candidates.

We may have conflicts with our partners, such as conflicts concerning the interpretation of preclinical or clinical data, the achievement of milestones, the interpretation of contractual obligations, payments for services, development obligations or the ownership of intellectual property developed during our collaboration. If any conflicts arise with any of our partners, such partner may act in a manner that is adverse to our best interests. Any such disagreement could result in one or more of the following, each of which could delay or prevent the development or commercialization of our product candidates, and in turn prevent us from generating revenues: unwillingness on the part of a partner to pay us milestone payments or royalties we believe are due under a collaboration; uncertainty regarding ownership of intellectual property rights arising from our collaborative activities, which could prevent us from entering into additional collaborations; unwillingness by the partner to cooperate in the development or manufacture of the product, including providing us with product data or materials; unwillingness on the part of a partner to keep us informed regarding the progress of its development and commercialization activities or to permit public disclosure of the results of those activities; initiating litigation or alternative dispute resolution options by either party to resolve the dispute; or attempts by either party to terminate the agreement.

Upon commercialization of our product candidates, we may be dependent on third parties to market, distribute and sell them.

Our ability to generate revenues may be dependent upon the sales and marketing efforts of any future co-marketing partners and third-party distributors. At this time, we have not entered into an agreement with any commercialization partner and only plan to do so after the successful completion of Phase 2 clinical trials and prior to commercialization. If we fail to reach an agreement with any commercialization partner, or if upon reaching such an agreement that partner fails to sell a large volume of our products, it may have a negative impact on our business, financial condition and results of operations.

Our product candidates will face significant competition in the markets for them, and if they are unable to compete successfully, our business will suffer.

Our product candidates face, and will continue to face, intense competition from large pharmaceutical companies, as well as academic and research institutions. We compete in an industry that is characterized by (i) rapid technological change, (ii) evolving industry standards, (iii) emerging competition and (iv) new product introductions. Our competitors have existing products and technologies that will compete with our product candidates and technologies and may develop and commercialize additional products and technologies that will compete with our product candidates and technologies. Because several competing companies and institutions have greater financial resources than us, they may be able to (i) provide broader services and product lines, (ii) make greater investments in research and development, or R&D, and (iii) carry on broader R&D initiatives. Our competitors also have greater development capabilities than we do and have substantially greater experience in undertaking preclinical and clinical testing of product candidates, obtaining regulatory approvals, and manufacturing and marketing pharmaceutical products. They also have greater name recognition and better access to customers than us. Our chief competitors include companies such as Bayer AG, GlaxoSmithKline Plc and Spectrum Pharmaceuticals, Inc. and others.

If side effects are identified during the time our product candidates are in development or after they are approved and on the market, we may choose to or be required to perform lengthy additional clinical trials, discontinue development of the affected product candidate, change the labeling of any such products, or withdraw or recall any such products from the market, any of which would hinder or preclude our ability to generate revenues.

Undesirable side effects caused by our product candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or other comparable foreign authorities. The drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly. Even if any of our product candidates receives marketing approval, as greater numbers of patients use a product following its approval, an increase in the incidence of side effects or the incidence of other post-approval problems that were not seen or anticipated during pre-approval clinical trials could result in a number of potentially significant negative consequences, including:

- regulatory authorities may withdraw their approval of the product;
- regulatory authorities may require the addition of labeling statements, such as warnings or contraindications;
- we may be required to change the way the product is administered, conduct additional clinical trials or change the labeling of the product;
- we may elect, or we may be required, to recall or withdraw product from the market;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could substantially increase the costs and expenses of developing, commercializing and marketing any such product candidates or could harm or prevent sales of any approved products.

Our business depends upon securing and protecting critical intellectual property.

Our commercial success will depend in part on our obtaining and maintaining patent, trade secret, copyright and trademark protection of our technologies in the United States and other jurisdictions, as well as successfully enforcing this intellectual property and defending this intellectual property against third-party challenges. We will only be able to protect our technologies from unauthorized use by third parties to the extent that valid and enforceable intellectual property protection, such as patents or trade secrets law, cover them. In particular, we place considerable emphasis on obtaining patent and trade secret protection for significant new technologies, products and processes. Furthermore, the degree of future protection of our proprietary rights is uncertain because legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep our competitive advantage. Moreover, the degree of future protection of our proprietary rights is uncertain for product candidates that are currently in the early stages of development because we cannot predict which of these product candidates will ultimately reach the commercial market or whether the commercial versions of these product candidates will incorporate proprietary technologies.

Our patent position is highly uncertain and involves complex legal and factual questions.

Accordingly, we cannot predict the breadth of claims that may be allowed or enforced under our patents or in third-party patents. For example, we or our licensors might not have been the first to make the inventions covered by each of our pending patent applications and issued patents; we or our licensors might not have been the first to file patent applications for these inventions; others may independently develop similar or alternative technologies or duplicate any of our technologies; it is possible that none of our pending patent applications or the pending patent applications of our licensors will result in issued patents; our issued patents and issued patents of our licensors may not provide a basis for commercially viable technologies, or may not provide us with any competitive advantages, or may be challenged and invalidated by third parties; and, we may not develop additional proprietary technologies that are patentable.

As a result, our owned and licensed patents may not be valid and we may not be able to obtain and enforce patents and to maintain trade secret protection for the full commercial extent of our technology. The extent to which we are unable to do so could materially harm our business.

We or our licensors have applied for and will continue to apply for patents for certain products. Such applications may not result in the issuance of any patents, and any patents now held or that may be issued may not provide us with adequate protection from competition. Furthermore, it is possible that patents issued or licensed to us may be challenged successfully. In that event, if we have a preferred competitive position because of such patents, such preferred position would be lost. If we are unable to secure or to continue to maintain a preferred position, we could become subject to competition from the sale of generic products. Failure to receive, inability to protect, or expiration of our patents for medical use, manufacture, conjugation and labeling of Ac-225, the antibodies that we license from third parties, or subsequent related filings, would adversely affect our business and operations.

Patents issued or licensed to us may be infringed by the products or processes of others. The cost of enforcing our patent rights against infringers, if such enforcement is required, could be significant, and we do not currently have the financial resources to fund such litigation. Further, such litigation can go on for years and the time demands could interfere with our normal operations. There has been substantial litigation and other proceedings regarding patent and other intellectual property rights in the pharmaceutical industry. We may become a party to patent litigation and other proceedings. The cost to us of any patent litigation, even if resolved in our favor, could be substantial. Some of our competitors may be able to sustain the costs of such litigation more effectively than we can because of their substantially greater financial resources. Litigation may also absorb significant management time.

Unpatented trade secrets, improvements, confidential know-how and continuing technological innovation are important to our scientific and commercial success. Although we attempt to and will continue to attempt to protect our proprietary information through reliance on trade secret laws and the use of confidentiality agreements with our partners, collaborators, employees and consultants and other appropriate means, these measures may not effectively prevent disclosure of our proprietary information, and, in any event, others may develop independently, or obtain access to, the same or similar information.

Certain of our patent rights are licensed to us by third parties. If we fail to comply with the terms of these license agreements, our rights to those patents may be terminated, and we will be unable to conduct our business.

If we are found to be infringing on patents or trade secrets owned by others, we may be forced to cease or alter our product development efforts, obtain a license to continue the development or sale of our products, and/or pay damages.

Our manufacturing processes and potential products may violate proprietary rights of patents that have been or may be granted to competitors, universities or others, or the trade secrets of those persons and entities. As the pharmaceutical industry expands and more patents are issued, the risk increases that our processes and potential products may give rise to claims that they infringe the patents or trade secrets of others. These other persons could bring legal actions against us claiming damages and seeking to enjoin clinical testing, manufacturing and marketing of the affected product or process. If any of these actions are successful, in addition to any potential liability for damages, we could be required to obtain a license in order to continue to conduct clinical tests, manufacture or market the affected product or use the affected process. Required licenses may not be available on acceptable terms, if at all, and the results of litigation are uncertain. If we become involved in litigation or other proceedings, it could consume a substantial portion of our financial resources and the efforts of our personnel.

Our ability to protect and enforce our patents does not guarantee that we will secure the right to commercialize our patents.

A patent is a limited monopoly right conferred upon an inventor, and his successors in title, in return for the making and disclosing of a new and non-obvious invention. This monopoly is of limited duration but, while in force, allows the patent holder to prevent others from making and/or using its invention. While a patent gives the holder this right to exclude others, it is not a license to commercialize the invention where other permissions may be required for commercialization to occur. For example, a drug cannot be marketed without the appropriate authorization from the FDA, regardless of the existence of a patent covering the product. Further, the invention, even if patented itself, cannot be commercialized if it infringes the valid patent rights of another party.

We rely on confidentiality agreements to protect our trade secrets. If these agreements are breached by our employees or other parties, our trade secrets may become known to our competitors.

We rely on trade secrets that we seek to protect through confidentiality agreements with our employees and other parties. If these agreements are breached, our competitors may obtain and use our trade secrets to gain a competitive advantage over us. We may not have any remedies against our competitors and any remedies that may be available to us may not be adequate to protect our business or compensate us for the damaging disclosure. In addition, we may have to expend resources to protect our interests from possible infringement by others.

The use of hazardous materials, including radioactive and biological materials, in our research and development efforts imposes certain compliance costs on us and may subject us to liability for claims arising from the use or misuse of these materials.

Our research, development and manufacturing activities involves the controlled use of hazardous materials, including chemicals, radioactive and biological materials, such as radioactive isotopes. We are subject to federal, state, local and foreign environmental laws and regulations governing, among other matters, the handling, storage, use and disposal of these materials and some waste products. We cannot completely eliminate the risk of contamination or injury from these materials and we could be held liable for any damages that result, which could exceed our financial resources. We currently maintain insurance coverage for injuries resulting from the hazardous materials we use; however, future claims may exceed the amount of our coverage. Also, we do not have insurance coverage for pollution cleanup and removal. Currently the costs of complying with such federal, state, local and foreign environmental regulations are not significant, and consist primarily of waste disposal expenses. However, they could become expensive, and current or future environmental laws or regulations may impair our research, development, production and commercialization efforts.

We may undertake international operations, which will subject us to risks inherent with operations outside of the United States.

Although we do not have any foreign operations at this time, we intend to seek market clearances in foreign markets that we believe will generate significant opportunities. However, even with the cooperating of a commercialization partner, conducting drug development in foreign countries involves inherent risks, including, but not limited to difficulties in staffing, funding and managing foreign operations; unexpected changes in regulatory requirements; export restrictions; tariffs and other trade barriers; difficulties in protecting, acquiring, enforcing and litigating intellectual property rights; fluctuations in currency exchange rates; and potentially adverse tax consequences.

If we were to experience any of the difficulties listed above, or any other difficulties, any international development activities and our overall financial condition may suffer and cause us to reduce or discontinue our international development and registration efforts.

We may not be successful in hiring and retaining key employees.

Our future operations and successes depend in large part upon the continued service of key members of our senior management team whom we are highly dependent upon to manage our business. If any member of our current senior management terminates his or her employment with us, such a departure may have a material adverse effect on our business.

Our future success also depends on our ability to identify, attract, hire or engage, retain and motivate other well-qualified managerial, technical, clinical and regulatory personnel. There can be no assurance that such professionals will be available in the market, or that we will be able to retain existing professionals or meet or continue to meet their compensation requirements. Furthermore, the cost base in relation to such compensation, which may include equity compensation, may increase significantly, which could have a material adverse effect on us. Failure to establish and maintain an effective management team and work force could adversely affect our ability to operate, grow and manage our business.

We may be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws, and health information privacy and security laws. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

If we obtain FDA approval for any of our product candidates and begin commercializing those products in the United States, our operations may be directly, or indirectly through our customers, subject to various federal and state fraud and abuse laws, including, without limitation, the federal Anti-Kickback Statute, the federal False Claims Act, and physician sunshine laws and regulations. These laws may impact, among other things, our proposed sales, marketing, and education programs. In addition, we may be subject to patient privacy regulation by both the federal government and the states in which we conduct our business. The laws that may affect our ability to operate include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce, or in return for, the purchase or recommendation of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;

- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payors that are false or fraudulent;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;

- HIPAA, as amended by the Health Information Technology and Clinical Health Act, or HITECH, and its implementing regulations, which imposes certain requirements relating to the privacy, security, and transmission of individually identifiable health information;

- the federal physician sunshine requirements under PPACA, which require certain manufacturers of drugs, devices, biologics, and medical supplies to report annually to the U.S. Department of Health and Human Services information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members and applicable group purchasing organizations;

- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payor, including commercial insurers; state laws that require pharmaceutical companies to comply with the industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. In addition, recent health care reform legislation has strengthened these laws. For example, the PPACA, among other things, amends the intent requirement of the federal anti-kickback and criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it to have committed a violation. Moreover, the PPACA provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, exclusion from participation in government health care programs, such as Medicare and Medicaid, imprisonment, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Healthcare legislative reform measures may have a material adverse effect on our business and results of operations.

In March 2010, former President Obama signed the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, "PPACA"), which makes changes that are expected to significantly impact the pharmaceutical industries. One of the principal aims of the PPACA as currently enacted is to expand health insurance coverage to approximately 32 million Americans who are currently uninsured. The consequences of this significant coverage expansion on the sales of our products, once they are developed, are unknown and speculative.

The PPACA contains a number of provisions designed to generate the revenues necessary to fund the coverage expansions among other things. This includes fees and taxes on manufacturers of certain branded prescription drugs, an abbreviated pathway for approval of biosimilar products, a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases in the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and an extension of the rebate program to individuals enrolled in Medicaid managed care organizations, and a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

The PPACA provisions on comparative clinical effectiveness research extend the initiatives of the American Recovery and Reinvestment Act of 2009, also known as the stimulus package, which included $1.1 billion in funding to study the comparative effectiveness of health care treatments and strategies. This stimulus funding was designated for, among other things, conducting, supporting or synthesizing research that compares and evaluates the risks and benefits, clinical outcomes, effectiveness and appropriateness of products. The PPACA appropriates additional funding to comparative clinical effectiveness research. Although Congress has indicated that this funding is intended to improve the quality of health care, it remains unclear how the research will impact current Medicare coverage and reimbursement or how new information will influence other third-party payor policies. There is a risk that President Donald Trump's administration could repeal or amend the PPACA, and it is uncertain what the effect of such repeal or amendments would have on our business, financial condition and results of operations.

In addition, other legislative changes have been proposed and adopted since the PPACA was enacted. On August 2, 2011, former President Obama signed into law the Budget Control Act of 2011, which, among other things, creates the Joint Select Committee on Deficit Reduction to recommend proposals in spending reductions to Congress. The Joint Select Committee did not achieve a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, which threatened to trigger the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and will stay in effect through 2024 unless additional Congressional action is taken. On January 2, 2013, Congress passed and former President Obama signed the American Taxpayer Relief Act of 2012 which, among other things, further reduced Medicare payments to certain providers, including physicians, hospitals and cancer treatment centers. We expect that the PPACA, as well as other federal or state health care reform measures that may be adopted in the future, could have a material adverse effect on our industry generally and our ability to successfully commercialize our products or could limit or eliminate our spending on certain development projects. The taxes imposed by the PPACA and the expansion in the government's role in the U.S. healthcare industry may result in decreased profits to us, lower reimbursement by payors for our products, and/or reduced medical procedure volumes, all of which may adversely affect our business, financial condition and results of operations.

Managing our growth as we expand operations may strain our resources.

We expect to need to grow rapidly in order to support additional, larger, and potentially international, pivotal clinical trials of our product candidates, which will place a significant strain on our financial, managerial and operational resources. In order to achieve and manage growth effectively, we must continue to improve and expand our operational and financial management capabilities. Moreover, we will need to increase staffing and to train, motivate and manage our employees. All of these activities will increase our expenses and may require us to raise additional capital sooner than expected. Failure to manage growth effectively could materially harm our business, financial condition or results of operations.

We may expand our business through the acquisition of rights to new product candidates that could disrupt our business, harm our financial condition and may also dilute current stockholders' ownership interests in our company.

Our business strategy includes expanding our products and capabilities, and we may seek acquisitions of product candidates, antibodies or technologies to do so. Acquisitions involve numerous risks, including substantial cash expenditures; potentially dilutive issuance of equity securities; incurrence of debt and contingent liabilities, some of which may be difficult or impossible to identify at the time of acquisition; difficulties in assimilating acquired technologies or the operations of the acquired companies; diverting our management's attention away from other business concerns; risks of entering markets in which we have limited or no direct experience; and the potential loss of our key employees or key employees of the acquired companies.

We can make no assurances that any acquisition will result in short-term or long-term benefits to us. We may incorrectly judge the value or worth of an acquired product, company or business. In addition, our future success would depend in part on our ability to manage the rapid growth associated with some of these acquisitions. We cannot assure that we will be able to make the combination of our business with that of acquired products, businesses or companies work or be successful. Furthermore, the development or expansion of our business or any acquired products, business or companies may require a substantial capital investment by us. We may not have these necessary funds or they might not be available to us on acceptable terms or at all. We may also seek to raise funds by selling shares of our preferred or common stock, which could dilute each current stockholder's ownership interest in the Company.

Risks Related to Ownership of Our Common Stock

The sale of securities by us in any equity or debt financing could result in dilution to our existing stockholders and have a material adverse effect on our earnings.

We believe we have sufficient cash on hand to finance research and development and to cover our ongoing working capital needs into the first quarter of 2019. We have financed our operations primarily through sales of stock and the issuance of convertible promissory notes. It is likely that during the next twelve months we will seek to raise additional capital through the sales of stock and/or issuance of convertible debentures in order to expand our level of operations to continue our research and development efforts.

Any sale of common stock by us in a future private placement offering could result in dilution to the existing stockholders as a direct result of our issuance of additional shares of our capital stock. In addition, our business strategy may include expansion through internal growth or by establishing strategic relationships with targeted customers and vendor. In order to do so, or to finance the cost of our other activities, we may issue additional equity securities that could dilute our stockholders' stock ownership. We may also assume additional debt and incur impairment losses related to goodwill and other tangible assets if we acquire another company and this could negatively impact our earnings and results of operations.

Our Common Stock has been considered a Penny Stock.

During the fiscal year 2013 and through the first quarter of 2017 our common stock has or had been a penny stock, therefore, when our stock is considered a penny stock trading in our securities may be subject to penny stock considerations. Broker-dealer practices in connection with transactions in "penny stocks" are regulated by certain penny stock rules adopted by the SEC.

Penny stocks generally are equity securities with a price of less than $5.00 (other than securities registered on certain national securities exchanges or quoted on the NYSE MKT system). Penny stock rules require a broker-dealer, prior to a transaction in a penny stock not otherwise exempt from the rules, to deliver a standardized risk disclosure document that provides information about penny stocks and the risks in the penny stock market. The broker-dealer also must provide the customer with current bid and offer quotations for the penny stock, the compensation of the broker-dealer and its salesperson in the transaction, and monthly account statements showing the market value of each penny stock held in the customer's account. The broker-dealer must also make a special written determination that the penny stock is a suitable investment for the purchaser and receive the purchaser's written agreement to the transaction. These requirements may have the effect of reducing the level of trading activity, if any, in the secondary market for a security that becomes subject to the penny stock rules. The additional burdens imposed upon broker-dealers by such requirements may discourage broker-dealers from effecting transactions in our securities, which could severely limit their market price and liquidity of our securities. These requirements may restrict the ability of broker-dealers to sell our common stock and may affect your ability to resell our common stock.

Our Common Stock is subject to price volatility unrelated to our operations.

The trading volume of our common stock has been and may continue to be extremely limited and sporadic. As a result of such trading activity, the quoted price for our common stock on the NYSE MKT may not necessarily be a reliable indicator of its fair market value.

We expect the market price of our Common Stock to fluctuate substantially due to a variety of factors, including market perception of our ability to achieve our planned growth, quarterly operating results of other companies in the same industry, trading volume in our common stock, changes in general conditions in the economy and the financial markets or other developments affecting the Company's competitors or the Company itself. This volatility has had a significant effect on the market price of securities issued by many companies for reasons unrelated to their operating performance and could have the same effect on our common stock.

Because we do not intend to pay dividends, stockholders will benefit from an investment in our Common Stock only if it appreciates in value.

We have never declared or paid any cash dividends on our Preferred Stock or Common Stock. For the foreseeable future, it is expected that earnings, if any, generated from our operations will be used to finance the growth of our business, and that no dividends will be paid to holders of our Preferred Stock or Common Stock. As a result, the success of an investment in our Preferred Stock or Common Stock will depend upon any future appreciation in its value. There is no guarantee that our Preferred Stock or Common Stock will appreciate in value.

Certain provisions of our Certificate of Incorporation and Bylaws and Delaware law make it more difficult for a third party to acquire us and make a takeover more difficult to complete, even if such a transaction were in the stockholders' interest.

Provisions of our certificate of incorporation and bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our stock. Among other things, the certificate of incorporation and bylaws:

- provide that the authorized number of directors may be changed by resolution of the board of directors;
- provide that all vacancies, including newly-created directorships, may, except as otherwise required by law, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide the board of directors into three classes;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner, and meet specific requirements as to the form and content of a stockholder's notice;

In addition, we are governed by Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a public Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes mergers, asset sales or other transactions resulting in a financial benefit to the stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years, did own, 15% or more of the corporation's outstanding voting stock. These provisions may have the effect of delaying, deferring or preventing a change in our control.

Compliance with the reporting requirements of federal securities laws can be expensive.

We are subject to the information and reporting requirements of the Exchange Act and other federal securities laws, and the compliance obligations of the Sarbanes-Oxley Act. The costs of preparing and filing annual and quarterly reports and other information with the SEC and furnishing audited reports to stockholders are substantial. In addition, we will incur substantial expenses in connection with the preparation of registration statements and related documents with respect to the registration of resale of the Common Stock.

Applicable regulatory requirements, including those contained in and issued under the Sarbanes-Oxley Act, may make it difficult for us to retain or attract qualified officers and directors, which could adversely affect the management of its business and its ability to obtain or retain listing of our Common Stock.

We may be unable to attract and retain those qualified officers, directors and members of board committees required to provide for effective management because of the rules and regulations that govern publicly held companies, including, but not limited to, certifications required by principal executive officers. The enactment of the Sarbanes-Oxley Act has resulted in the issuance of a series of related rules and regulations and the strengthening of existing rules and regulations by the SEC, as well as the adoption of new and more stringent rules by the stock exchanges. The perceived increased personal risk associated with these changes may deter qualified individuals from accepting roles as directors and executive officers.

Further, some of these changes heighten the requirements for board or committee membership, particularly with respect to an individual's independence from the corporation and level of experience in finance and accounting matters. We may have difficulty attracting and retaining directors with the requisite qualifications. If we are unable to attract and retain qualified officers and directors, the management of our business and our ability to obtain or retain listing of our shares of Common Stock on any stock exchange (assuming we elect to seek and are successful in obtaining such listing) could be adversely affected.

If we fail to maintain an effective system of internal controls, we may not be able to accurately report our financial results or detect fraud. Investors could lose confidence in our financial reporting and this may decrease the trading price of our Common Stock.

We must maintain effective internal controls to provide reliable financial reports and detect fraud. In future periods, we may identify deficiencies in our system of internal controls over financial reporting that may require remediation. There can be no assurances that any such future deficiencies identified may not be material weaknesses that would be required to be reported in future periods. Failure to maintain an effective system of internal controls could harm our operating results and cause investors to lose confidence in our reported financial information. Any such loss of confidence would have a negative effect on the trading price of our Common Stock.

The price of our common stock may become volatile, which could lead to losses by investors and costly securities litigation.

The trading price of our Common Stock may be highly volatile and could fluctuate in response to factors such as:

- actual or anticipated variations in our operating results;
- announcements of developments by us or our competitors;
- the timing of IND and/or BLA approval, the completion and/or results of our clinical trials;
- regulatory actions regarding our products;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- adoption of new accounting standards affecting our industry;
- additions or departures of key personnel;
- introduction of new products by us or our competitors;
- sales of our Common Stock or other securities in the open market; and
- other events or factors, many of which are beyond our control.

The stock market is subject to significant price and volume fluctuations. In the past, following periods of volatility in the market price of a company's securities, securities class action litigation has often been initiated against such a company. Litigation initiated against us, whether or not successful, could result in substantial costs and diversion of our management's attention and Company resources, which could harm our business and financial condition.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES.

None

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION.

None.

ITEM 6. EXHIBITS

Copies of the following documents are included as exhibits to this report pursuant to Item 601 of Regulation S-K.

Exhibit No.	Title of Document	Location
10.1	Assignment and Consent Agreement, dated June 6, 2017, among 275 Madison Avenue RPW 1 LLC, 275 Madison Avenue RPW 2, LLC, Actinium Pharmaceuticals, Inc. and Relmada Therapeutics, Inc.	Attached
10.2	Agreement of Lease, dated June 9, 2015, by and between Relmada Therapeutics, Inc. and GP 275 Owner, LLC (incorporated by reference to Exhibit 10.1 to Relamda Therapeutics, Inc. Form 8-K filed on June 15, 2015).	
10.3	Amended and Restated License Agreement, dated June 8, 2017, between Actinium Pharmaceuticals, Inc. and Relmada Therapeutics, Inc.	Attached
10.4	Offer Letter; dated May 26, 2017, by and between Actinium Pharmaceuticals, Inc. and Dr. Nitya G. Ray	Attached
10.5	Amended and Restated At-the-Market Market Issuance Sales Agreement, dated July 3, 2017, among FBR Capital Markets & Co., JonesTrading Institutional Services LLC, and MLV & Co. LLC.	Attached
10.6	Agreement, dated June 6, 2017, by and between Actinium Pharmaceuticals, Inc. and Sergio Traversa	Attached
10.7	Consulting Agreement, dated May 22, 2017, by and between Actinium Pharmaceuticals, Inc. and Dragan Cicic.	Attached
10.8	Separation and Settlement Agreement, dated May 12, 2017, by and between Actinium Pharmaceuticals, Inc. and Kaushik Dave.	Attached
10.9	Separation and Settlement Agreement, dated May 12, 2017, by and between Actinium Pharmaceuticals, Inc. and Dragan Cicic.	Attached
31.1	Certification of the Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	Attached
31.2	Certification of the Principal Financial and Accounting Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	Attached
32.1	Certification of the Principal Executive Officer pursuant to U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002*	Attached
32.2	Certification of the Principal Financial and Accounting Officer pursuant to U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002*	Attached
101.INS	XBRL Instance Document	Attached
101.SCH	XBRL Taxonomy Extension Schema Document	Attached
101.CAL	XBRL Taxonomy Calculation Linkbase Document	Attached
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Attached
101.LAB	XBRL Taxonomy Label Linkbase Document	Attached
101.PRE	XBRL Taxonomy Presentation Linkbase Document	Attached

* The Exhibit attached to this Form 10-Q shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 (the "Exchange Act") or otherwise subject to liability under that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as expressly set forth by specific reference in such filing.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

ACTINIUM PHARMACEUTICALS, INC.

Date: August 4, 2017

By: */s/ Sandesh Seth*
Sandesh Seth
Chairman and Chief Executive Officer
(Duly Authorized Officer and
Principal Executive Officer)

By: */s/ Steve O'Loughlin*
Steve O'Loughlin
Vice President, Finance and
Corporate Development
(Duly Authorized Officer and Principal Financial and Accounting Officer)

Exhibit 10.1

THIS ASSIGNMENT AND CONSENT AGREEMENT (this "Agreement"), made as of the 6th day of June, 2017, between **275 MADISON AVENUE RPW 1 LLC and 275 MADISON AVENUE RPW 2 LLC** , having an office in care of RPW Group, Inc., 800 Westchester Avenue, Rye Brook, New York 10573, hereinafter referred to collectively as the " Owner," **RELMADA THREAPEUTICS, INC.,** having an office at 275 Madison Avenue, Suite 702, New York, New York 10016, hereinafter referred to as the " Assignor," and **ACTINIUM PHARMACEUTICALS, INC.,** having an office at 275 Madison Avenue, Suite 702, New York, New York 10016, hereinafter referred to as the "Assignee."

W I T N E S S E T H:

WHEREAS, Owner, is the fee simple owner of the building commonly known as and located at 275 Madison Avenue, Suite 702, New York, New York 10016 (the "Building");

WHEREAS, Owner's predecessor in interest entered into that certain Agreement of Lease with Assignor dated as of June 9, 2015, as amended by Commencement Date Agreement and First Amendment of Lease dated as of September 25, 2015, (hereinafter referred to collectively as the "Lease") for certain premises located on the seventh (7^{th}) floor of the Building, commonly known as Suite 702, as more particularly described in the Lease (hereinafter referred to collectively as the "Premises");

WHEREAS, Assignee has occupied the Premises as licensee of Assignor, and Assignor and Assignee have now agreed that Assignor shall assign the Lease to Assignee, and Assignee has agreed to assume all of all Assignor's rights and obligations under the Lease;

WHEREAS, Owner has agreed to consent to the assignment of the Lease by Assignor to Assignee as hereinafter specifically provided;

WHEREAS, capitalized terms not otherwise defined in this Agreement shall have the meanings ascribed to them under the Lease;

NOW, THEREFORE, for and in consideration of the foregoing and for other good and valuable consideration and of the mutual agreements hereinafter set forth, Owner, Assignor and Assignee stipulate, covenant and agree as follows:

ARTICLE 1 - ASSIGNMENT AND ASSUMPTION OF THE LEASE

SECTION 1.01. Assignor hereby transfers to Assignee, all of Assignor's right, title and interest in and to the Lease, **provided, however,** that Assignee does hereby agree to assume all of the duties, liabilities and obligations of the tenant under the Lease accruing from and after (but not prior to) the date hereof, including, but not limited to the payment of rent; and covenants and agrees to save, defend, indemnify and hold Assignor, its members, managers, shareholders, directors, officers, employees, agents successors and assigns (collectively, "Assignor Indemnitees") harmless from and against any and all demands, claims, causes of action, actions, liabilities, obligations, losses, damages, costs, charges, counsel fees and other expenses of every nature and character whatsoever which may be incurred by Assignor and/or any other Assignor Indemnitees by reason of Assignee's failure to comply or perform any covenant, term, condition, or agreement in the Lease to be complied with or performed by the tenant thereunder from and after the date hereof.

SECTION 1.02. Assignor covenants and agrees to save, defend, indemnify and hold Assignee, its members, managers, shareholders, directors, officers, employees, agents successors and assigns (collectively, "Assignee Indemnitees") harmless from and against any and all demands, claims, causes of action, actions, liabilities, obligations, losses, damages, costs, charges, counsel fees and other expenses of every nature and character whatsoever which may be incurred by Assignee and/or any other Assignee Indemnitees by reason of Assignor's failure to comply or perform any covenant, term, condition, or agreement in the Lease to be complied with or performed by the tenant under the Lease prior to the date hereof.

ARTICLE 2 - CONSENT

SECTION 2.01. Owner hereby consents to the assignment of the Lease by Assignor to Assignee, **provided, however,** that nothing contained herein shall be construed to: (i) waive, modify, impair or affect any of the provisions of the Lease; (ii) waive payment of the Rent Arrears; (iii) waive any present or future breach of, or default under, the Lease, or the rights of Owner against any person, firm, association or corporation liable or responsible for the performance thereof; (iv) enlarge or increase Owner's obligations or the tenants rights under the Lease, or otherwise; (v) to release Assignor and Assignee from any and all of their respective liability under the Lease; and (vi) all of the provisions of the Lease are hereby declared to be in full force and effect.

SECTION 2.02. This consent is not, and shall not be construed as, a consent by Owner to, or as permitting, any other or further assignments.

SECTION 2.03. In the event of any breach of, or default under, the Lease, or the rights of Owner against any person, firm association or corporation liable or responsible for the performance under the Lease, or in the event of an inconsistency between the provisions of the Lease and/or this Assignment, the provisions of the Lease shall control and prevail.

ARTICLE 3 - REPRESENTATIONS

SECTION 3.01. Assignor, for itself and its legal representatives, successors and assigns, covenants and represents to Assignee and Owner as follows: (i) Assignor has full right, authority and power to assign the Lease to Assignee; (ii) Assignor has not assigned, transferred, pledged or otherwise encumbered all or any part of its right, title and interest in and to the Lease and/or the Premises, and the Lease is free and clear of any liens and encumbrances made by Assignor; (iii) except as otherwise specifically provided for in this Agreement, to Assignor's knowledge, Assignor is not on the date hereof in default under any of the terms of the Lease, having performed all of the obligations imposed upon Assignor thereunder, and as of the date hereof, the Lease is in full force and effect and enforceable in accordance with its respective terms; (iv) except as otherwise specifically provided for in this Agreement, Assignor has no knowledge of any default in the performance and observance of any obligations contained in the Lease, to be kept, observed and performed by Owner, or any condition, which with the giving of notice or passage of time, or both, would constitute a default under the Lease; (v) that it is a corporation duly organized and in good standing; (vi) that it has all requisite authority to execute and to enter into this Agreement and that the execution of this Agreement will not constitute a violation of any law, agreement or other rule of governance; and (vii) that the individual executing this Agreement on behalf of Assignor is so authorized.

SECTION 3.02.A. Assignee, for itself and its legal representatives, successors and assigns, covenants and represents to Assignor and Owner as follows: (i) that it has all requisite authority to execute and to enter into this Agreement and that the execution of this Agreement will not constitute a violation of any internal by-law, agreement or other rule of governance, (ii) that the individual executing this Agreement on behalf of Assignee is so authorized; (iii) that the Premises shall continue to be used for the use permitted under the Lease; and (iv) Assignee has assumed all of the obligations of Assignor under the Lease.

B. Assignee represents and warrants that Assignee is not now acting and shall not in the future act, directly or indirectly, for or on behalf of any person, group, entity or nation named by any Executive Order or the United States Department of the Treasury as a terrorist, "Specially Designated and Blocked Persons", or other banned or blocked person, group, entity, nation or transaction pursuant to any law, order, rule or regulation that is enforced or administered by the Office of Foreign Asset Control ("OFAC") of the United States Department of the Treasury. Assignee further represents and warrants that Assignee is not now engaged and shall not in the future be engaged, directly or indirectly, in any dealings or transactions or otherwise be associated with such person, group, entity or nation; and Assignee hereby agrees to defend, indemnify and hold Owner harmless from and against any and all claims, losses, costs, expenses, damages and liabilities (including, without limitation, attorneys' fees) arising from or related to any breach of the foregoing representations.

ARTICLE 4 – SECURITY DEPOSIT

SECTION 4.01. Assignee acknowledges and agrees regarding the Security Deposit as follows: (i) Assignee shall furnish Owner with cash or a letter of credit in the amount of **Three Hundred Ninety Thousand, Eight Hundred Twenty-Five ($390,825.00)** in accordance with Article 27 of the Lease, and (ii) Section 27D of Article 27 of the Lease regarding the reduction of the Security Deposit is hereby deleted in its entirety.

ARTICLE 5 - MISCELLANEOUS

SECTION 5.01. Assignor agrees to reimburse Owner for its legal costs and expenses in connection with preparing this Agreement in the amount of **One Thousand, Two Hundred Fifty and 00/100 ($1,250.00) Dollars**. Such payment shall be made directly to Owner's attorney simultaneously with the execution and delivery of this Agreement.

SECTION 5.02. All other terms, covenants and conditions of the Lease and all exhibits and schedules thereto shall remain in full force and effect, are hereby ratified, confirmed and incorporated herein by reference as though set forth fully herein at length.

SECTION 5.03. This Agreement may be executed in counterparts, which when taken together shall be construed as a complete agreement.

[Signature page(s) follow]

IN WITNESS WHEREOF, duly authorized representatives of the parties hereto have executed this Agreement as of the day and year first above written.

275 MADISON AVENUE RPW 1 LLC, (Owner)

By: /s/ Robert P. Weisz
Name: Robert P. Weisz
Title: President

275 MADISON AVENUE RPW 2 LLC, (Owner)

By: /s/ Robert P. Weisz
Name: Robert P. Weisz
Title: President

RELMADA THERAPEUTICS, INC., (Assignor)

By: /s/ Sergio Traversa
Name: Sergio Traversa
Title: CEO

ACTINIUM PHARMACEUTICALS, INC.,
(Assignee)

By: /s/ Steve O'Loughlin
Name: Steve O'Loughlin
Title: Principal Financial Officer

Exhibit 10.3

AMENDED AND RESTATED LICENSE AGREEMENT

This Amended and Restated License Agreement (this "Agreement") is entered on this 8th day of June, 2017, between Relmada Therapeutics, Inc., a Nevada corporation ("Relmada"), and Actinium Pharmaceuticals, Inc., a Delaware corporation ("Actinium"), with respect to the office space (the "Premises") located on the 7th floor of the office building located at 275 Madison Avenue, New York, New York ("the Building"), upon and subject to the following terms and conditions:

This Agreement amends and restates in its entirety that certain Office Space License Agreement, dated as of March 10, 2016 and effective as of January 1, 2016, between Relmada and Actinium (the "Original Agreement") for office space within the Premises. This Agreement is intended to and does completely amend and restate the Original Agreement.

A. As of the date hereof, Relmada and Actinium have entered into an Assignment and Assumption Agreement (the "Assignment and Assumption") pursuant to which Actinium will occupy the entire Premises in accordance with the terms thereof and assume Relmada's obligations under that certain Lease, dated June 9, 2015, (the "Lease") between 275 Madison Avenue RPW 1 LLC and 275 Madison Avenue RPW 2 LLC RPW (as successor in interest to GP 275 Owner, LLC) and Relmada, among other things.

B. Relmada and Actinium desire to amend and restate the Original Agreement with respect to Actinium's occupancy of the Client Area (as defined under the Original Agreement"), to reflect Actinium's continued license to use the furniture, fixtures, equipment and tenant improvements (collectively, "FFE") located in the Premises.

NOW THEREFORE, in consideration of the License Fee (as hereinafter defined) to be paid, the mutual covenants and agreements herein contained, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. License to Use: (a) Relmada hereby grants Actinium the license to use the FFE that is located in the Premises, a schedule of which is attached hereto as Exhibit A, for a period of time that shall be coterminous with the Lease (the "Term"). For the duration of the Term, Actinium shall pay Relmada the amount of $7,529.00 per month (the "Licensee Fee") on the first calendar day of each month.

(b) This FFE use license is granted, and Actinium hereby accepts such license, on an "AS-IS, WITH ALL FAULTS" basis, without recourse, representation or warranty of any kind or nature, express or implied, including without limitation, habitability, merchantability or fitness for a particular purpose.

(c) During the Term, Actinium, at its sole cost and expense, shall keep and maintain the FFE, in a good state of repair, normal wear and tear excepted, and shall be responsible for replacement and/or repair of any FFE which is not returned because it is damaged, lost or stolen. Actinium shall not remove any of the FFE from the Premises without prior written approval of Relmada. Relmada shall be granted access to the Premises at reasonable times, upon advance written notice for the purposes of inspecting the FFE. Relmada shall have no obligation to repair, maintain or insure any of the FFE. Actinium, at its sole cost and expense, shall insure the FFE (and name Relmada as additional insured) for its full replacement value.

(d) At the expiration or earlier termination of Term, the FFE shall be returned and surrendered to Relmada, at such location as designated by Relmada, in good condition and repair, reasonable wear and tear excepted.

(e) Actinium shall not have the right to and shall not (i) remove the FFE from the Premises or modify the FFE in any way, or (ii) pledge or encumber any of the FFE in any way.

2. Right to Purchase: Actinium shall have at any time during the Term of this Agreement the right to purchase the FFE by delivering written notice of such intent to Relmada together with a tender of payment of a purchase price equal to the FFE Consideration (as hereinafter defined). The purchase contemplated by the previous sentence will be effected by the execution and delivery by the parties of a Bill of Sale in form and substance mutually acceptable to both parties. "FFE Consideration" shall mean $ 496,909.00 less any License Fee(s) previously paid by Actinium.

3. Termination of License to use "Client Area" (as defined in the Original Agreement): Upon the execution by both parties of the Assignment and Assumption, the Original Agreement shall be deemed terminated as relating to Actinium's occupancy of the Client Area, except for any covenant, term, condition or agreement to be complied with or performed by Actinium under the Original Agreement prior to the date hereof, which shall be deemed to survive.

4. Default: Each of the following shall constitute a "Default" by Actinium:

(a) The failure of Actinium to pay any sum when due, and such failure continues for a period of five (5) days thereafter.

(b) Actinium shall become insolvent or unable to pay its debts as they become due, or Actinium notifies Relmada that it anticipates either condition; or Actinium files a petition under any section or chapter of the United States Bankruptcy Code, as amended from time to time; or a petition shall be filed against Actinium under such statute or Actinium notifies Relmada that it knows such a petition will be filed and such petition is not withdrawn or dismissed within sixty (60) days of filing; or a receiver or trustee is appointed to take possession of substantially all of Actinium's assets located at the Premises or of Actinium's interest in this Agreement is legally attached or seized.

(c) Actinium shall fail to perform, in whole or in part, any of the other obligations under this Agreement and such failure or non-performance continues for a period of five (5) days after written notice thereof has been given by Relmada.

5. Remedies - Termination: (a) If a Default occurs, then at any time thereafter, prior to the curing thereof, Actinium shall be deemed to have automatically exercised its right to purchase the FFE pursuant to Section 2 hereof and the FFE Consideration shall be immediately due and payable, and Relmada may exercise any and all rights and remedies available to Relmada, with or without notice of demand, under this Agreement, at law, or in equity, to recover and collect the FFE Consideration and/or to terminate this Agreement.

(b) Actinium shall pay all reasonable attorney and other fees, expenses and costs incurred by Relmada in protecting its rights under this Agreement and/or for any action taken by Relmada to collect any amounts due by Actinium under this Agreement.

6. Indemnification: Actinium covenants and agrees to indemnify and hold Relmada harmless from and against any and all losses, damages, costs, charges, counsel fees and other expenses of every nature and character whatsoever which may be incurred by Relmada by reason of Actinium's use of the FFE and by reason of Actinium's failure to comply or perform any covenant, term, condition, or agreement in this Agreement to be complied with or performed by Actinium.

7. Entire Agreement: This Agreement, including all Exhibit(s) attached hereto (which Exhibit(s) are hereby incorporated herein and shall constitute a portion hereof), contains the entire agreement between Relmada and Actinium with respect to the subject matter hereof.

8. Severability: It is the intention of the parties hereto that if any provision of this Agreement is capable of two constructions, one of which would render the provision invalid and the other of which would render the provision valid, then the provision shall have the meaning which renders it valid. If any term or provision of this Agreement, or the application thereof to any person or circumstance, shall to any extent be invalid or unenforceable, the remainder of this Agreement, or the application of such term or provision to other persons or circumstances, shall not be affected thereby, and each term and provision of this Agreement shall be valid and enforced to the fullest extent permitted by law.

9. Counterparts: This Agreement may be executed in any number of separate counterparts, all of which counterparts taken together shall constitute the entirety of this Agreement.

IN WITNESS WHEREOF, Relmada and Actinium have executed this Agreement as of the date first above written.

RELMADA THERAPEUTICS, INC.

By: /s/ Sergio Traversa
Name: Sergio Traversa
Title: Chief Executive Officer

ACTINIUM THERAPEUTICS, INC.

By: /s/ Steve O'Loughlin
Name: Steve O'Loughlin
Title: Principal financial Officer

EXHIBIT A

ITEMIZED INVENTORY OF FFE

Exhibit 10.4

May 26, 2017

Dr. Nitya G. Ray
14 Baybury Court
East Hanover, NJ 07936

Dear Dr. Ray,

On behalf of Actinium Pharmaceuticals, Inc. (the "Company"), I am pleased to offer you the position of Executive Vice-President, Head of Product Development, Manufacturing and Supply Chain. Speaking for myself, as well as the other members of the Company's Board of Directors (the "Board"), we are all very impressed with your credentials and look forward to your future success in this position.

1. Position. The terms of your new position with the Company are as set forth below:

(a) You shall serve as Executive Vice-President, Head of Product Development, Manufacturing and Supply Chain.

You shall report to the Executive Chairman or appropriate company officer, as designated by the Board, and shall perform your duties for the Company at the Company's offices in New York City, except for travel that may be necessary or appropriate in connection with the performance of your duties hereunder. The offices of the Company are currently located in New York City at 275 Madison Avenue, 7th Floor, New York, NY 10016.

(b) You agree to devote your best efforts and substantially all of your business time to advance the interests of the Company and to discharge adequately your duties hereunder.

2. Start Date. Subject to fulfillment of any conditions imposed by this letter agreement, you will commence this new position with the Company no later than June 15, 2017 ("Start Date"), subject to Board approval prior to the Start Date. The Company has the right to withdraw this Offer if you are unable to fulfill the Start Date requirement.

3. Proof of Right to Work. For purposes of federal immigration law, you will be required to provide to the Company documentary evidence of your identity and eligibility for employment in the United States. Such documentation must be provided to us within three (3) business days of your date of hire, or our employment relationship with you may be terminated.

4. Compensation.

(a) Base Salary. You will be paid an annual base salary of Three Hundred Twenty Five Thousand dollars ($325,000), which will be paid in accordance with the Company's regular payroll practices.

(b) Performance Bonus. You shall be entitled to participate in an executive bonus program, which shall be established by the Board pursuant to which the Board may award bonuses of up to 30% to you, based upon the achievement of written individual and corporate objectives such as the Board shall determine.

(c) Stock Option Grant. The Board has agreed to grant you an option grant to purchase 250,000 common shares of the Company (the "Grant") and is subject to approval by the Compensation Committee.

(i) Stock Options. Such options will have an exercise price equal to the closing price of the Company's common stock on your first day of employment (the "Grant Date").

(ii) Vesting Schedule. Twenty-eight percent (28%) of the initial options or restricted stock granted shall vest twelve months after the date of grant and two percent (2%) of the remainder shall vest each month thereafter until fully vested. Such additional options or restricted stock will have an exercise price per share which is equal to fair market value as determined by the Board on the date of the grant. Two percent (2%) of such additional options or stock shall vest each month thereafter until fully vested. The term of all options granted under this Agreement will be for 10 years from the date of grant, subject to your continuing service with the Company. The options or restricted stock will be incentive stock options or stock to the maximum extent allowed by the tax code and will be subject to the terms of the Company's Amended and Restated 2014 Stock Plan, as amended, and the Stock Option Agreement between you and the Company.

5. Benefits.

a. Benefit plan – Health Insurance. The Company will provide you with the opportunity to participate in the standard benefits plans currently available to other similarly situated employees. The Company reserves the right to cancel and/or change the benefits plans it offers to its employees at any time, subject to applicable law.

b. Vacation; Sick Leave. You will be entitled to 20 days paid vacation per year, pro-rated for the remainder of this calendar year. Vacation may not be taken before it is accrued. You will be entitled to 5 days paid sick leave per year pro-rated.

c. Other Benefits. The Company will provide you with standard business reimbursements (including mileage, supplies, long distance calls), subject to Company policies and procedures and with appropriate receipts. In addition, you will receive any other statutory benefits required by law.

d . Reimbursement of Expenses. You shall be reimbursed for all normal items of travel and entertainment and miscellaneous expenses reasonably incurred by you on behalf of the Company provided such expenses are documented and submitted in accordance with the reimbursement policies in effect from time to time.

6 . Confidential Information and Invention Assignment Agreement. Your acceptance of this offer and commencement of employment with the Company is contingent upon the execution, and delivery to an officer of the Company, of the Company's Confidential Information and Invention Assignment Agreement, a copy of which is enclosed for your review and execution (the "Confidentiality Agreement"), prior to or on your Start Date.

7 . At-Will Employment. Your employment with the Company will be on an "at will" basis, meaning that either you or the Company may terminate your employment at any time for any reason or no reason, without further obligation or liability.

8 . Non-Competition. During the term and for a period of three (3) years thereafter, you shall not, either directly or indirectly, engage (as principal, partner, employee, consultant, owner, independent contractor, advisor or otherwise, with or without compensation) in any business that directly or indirectly is developing, or plans to develop, radioimmunotherapies for cancer or any therapy related to bone marrow transplant (the "Competing Business"). Notwithstanding the foregoing, this does not prevent you from being engaged or employed with a business that has a Competing Business as part of its business, so long as you are not engaged or involved in any way in the Competing Business at such business or enterprise.

9 . Non-Solicitation. You agree that during the term of your employment with the Company, and for a period of 24 months following the cessation of employment with the Company for any reason or no reason, you shall not directly or indirectly solicit, induce, recruit or encourage any of the Company's employees or consultants to terminate their relationship with the Company, or attempt any of the foregoing, either for yourself or any other person or entity. For a period of 24 months following cessation of employment with the Company for any reason or no reason, you shall not attempt to negatively influence any of the Company's clients or customers from purchasing Company products or services or to solicit or influence or attempt to influence any client, customer or other person either directly or indirectly, to direct his or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company.

10. Arbitration. Any dispute or claim arising out of or in connection with your employment with the Company (except with regard to enforcement of the Confidentiality Agreement) will be finally settled by arbitration in New York, New York in accordance with the Commercial Arbitration Rules of the American Arbitration Association by one arbitrator appointed in accordance with said rules. Judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The parties agree that this Agreement evidences a transaction involving interstate commerce and that the operation, interpretation and enforcement of this arbitration provision, the procedures to be used in conducting an arbitration pursuant to this arbitration provision, and the confirmation of any award issued to either party by reason of such arbitration, is governed exclusively by the Federal Arbitration Act, 9 U.S.C. § 21 et seq. Notwithstanding the foregoing, the parties may apply to any court of competent jurisdiction for preliminary or interim equitable relief, or to compel arbitration in accordance with this paragraph, without breach of this arbitration provision.

11. Miscellaneous. This Agreement, together with the Confidentiality Agreement, sets forth the terms of your employment with the Company and supersedes any prior representations or agreements, whether written or oral. This Agreement may not be modified or amended except by a written agreement, signed by the Company and by you. Whenever possible, each provision of this Agreement will be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement is held to be invalid, illegal or unenforceable in any respect under any applicable law or rule in any jurisdiction, such invalidity, illegality or unenforceability will be lessened or reduced to the extent possible or will be severed and will not affect any other provision and this Agreement will be reformed, construed and enforced in such jurisdiction as if such invalid, illegal or unenforceable provision had never been contained herein. This Agreement will be governed by New York law without reference to rules of conflicts of law. All notices, requests, demands and other communications called for hereunder shall be in writing and shall be deemed given (i) on the date of delivery if delivered personally, (ii) one (1) day after being sent by a well established commercial overnight service, (iii) three (3) days after being mailed by registered or certified mail, return receipt requested, prepaid and addressed to the parties or their successors at the following addresses, or at such other addresses as the parties may later designate in writing, (iv) upon confirmation of facsimile transfer, if sent by facsimile or (v) upon confirmation of delivery when directed to the electronic mail address set forth below, if sent by electronic mail:

If to the Company:	275 Madison Avenue, Suite 702 New York, NY 10016
If to you:	Dr. Nitya G. Ray 14 Baybury Court East Hanover, NJ 07936

We are all delighted to be able to extend you this offer and look forward to working with you. To indicate your acceptance of the Company's offer, please sign and date this letter in the space provided below and return it to me, along with a signed and dated copy of the Confidentiality Agreement.

(signature page follows)

Very truly yours,

ACTINIUM PHARMACEUTICALS, INC.

By: /s/ Sandesh Seth
Name: Sandesh Seth
Title: Executive Chairman

May 26, 2017
Date

ACCEPTED AND AGREED:

DR. NITYA G. RAY

/s/ Nitya G. Ray
Signature

May 26, 2017
Date

Actinium Pharmaceuticals, Inc.

CONFIDENTIAL INFORMATION AND
INVENTION ASSIGNMENT AGREEMENT

As a condition of my becoming employed by Actinium Pharmaceuticals, Inc., a Delaware corporation, or any of its current or future subsidiaries, affiliates, successors or assigns (collectively, the "Company"), and in consideration of my employment with the Company and my receipt of the compensation now and hereafter paid to me by the Company, I agree to the following:

1. **Employment Relationship.** I understand and acknowledge that this Agreement does not alter, amend or expand upon any rights I may have to continue in the employ of, or the duration of my employment relationship with, the Company under any existing agreements between the Company and me or under applicable law. Any employment relationship between the Company and me, whether commenced prior to or upon the date of this Agreement, shall be referred to herein as the "Relationship."

2. **Duties.** I will perform for the Company such duties as may be designated by the Company from time to time. During the Relationship, I will devote my best efforts to the interests of the Company and will not engage in other employment or in any activities detrimental to the best interests of the Company without the prior written consent of the Company.

3. **At-Will Relationship.** I understand and acknowledge that my Relationship with the Company is and shall continue to be at-will, as defined under applicable law, meaning that either I or the Company may terminate the Relationship at any time for any reason or no reason, without further obligation or liability.

4. **Confidential Information.**

(a) **Company Information.** I agree at all times during the term of my Relationship with the Company and thereafter for 24 months, to hold in strictest confidence, and not to use, except for the benefit of the Company to the extent necessary to perform my obligations to the Company under the Relationship, or to disclose to any person, firm, corporation or other entity without written authorization of the Board of Directors of the Company, any Confidential Information of the Company which I obtain or create. I further agree not to make copies of such Confidential Information except as authorized by the Company. I understand that "Confidential Information" means any Company proprietary information, technical data, trade secrets or know-how, including, but not limited to, research, product plans, products, services, suppliers, customer lists and customers (including, but not limited to, customers of the Company on whom I called or with whom I became acquainted during the Relationship), prices and costs, markets, software, developments, inventions, laboratory notebooks, processes, formulas, technology, designs, drawings, engineering, hardware configuration information, marketing, licenses, finances, budgets or other business information disclosed to me by the Company either directly or indirectly in writing, orally or by drawings or observation of parts or equipment or created by me during the period of the Relationship, whether or not during working hours. I understand that "Confidential Information" includes, but is not limited to, information pertaining to any aspects of the Company's business which is either information not known by actual or potential competitors of the Company or other third parties not under confidentiality obligations to the Company, or is otherwise proprietary information of the Company or its customers or suppliers, whether of a technical nature or otherwise. I further understand that Confidential Information does not include any information which has become publicly known and made generally available through no wrongful act of mine, was known to me at the time it was disclosed, is lawfully and in good faith made available to me by a third party who did not derive it, directly or indirectly from the Company, or is information that is independently discovered or developed by me without violating my obligations under this agreement and which can be demonstrated by competent evidence.

(b) **Prior Obligations.** I represent that my performance of all terms of this Agreement as an employee of the Company has not breached and will not breach any agreement to keep in confidence information acquired by me prior or subsequent to the commencement of my Relationship with the Company, and I will not disclose to the Company or use any inventions, confidential or non-public proprietary information or material belonging to any previous client, employer or any other party. I will not induce the Company to use any inventions, confidential or non-public proprietary information or material belonging to any previous client, employer or any other party. I acknowledge and agree that I have in good faith listed on Exhibit B all agreements (e.g., non-competition agreements, non-solicitation of customers agreements, non-solicitation of employees agreements, confidentiality agreements, inventions agreements, etc.) with a current or former employer, or any other person or entity, that may reasonably restrict my ability to recruit or engage customers or service providers on behalf of the Company, or otherwise relate to or restrict my ability to perform my duties as an employee of the Company or any obligation I may have to the Company.

(c) **Third Party Information.** I recognize that the Company has received and in the future will receive confidential or proprietary information from third parties subject to a duty on the Company's part to maintain the confidentiality of such information and to use it only for certain limited purposes. I agree to hold all such confidential or proprietary information in the strictest confidence and not to disclose it to any person, firm or corporation or to use it except as necessary in carrying out my work for the Company consistent with the Company's agreement with such third party.

5. **Inventions.**

(a) **Inventions Retained and Licensed.** I have in good faith and to best of my knowledge attached hereto, as Exhibit A, a list describing with particularity all inventions, original works of authorship, developments, improvements, and trade secrets which were made by me prior to the commencement of the Relationship (collectively referred to as "Prior Inventions"), which belong solely to me or belong to me jointly with another, which as of the execution of this agreement may reasonably relate in any way to any of the Company's proposed businesses, products or research and development, and which are not assigned to the Company hereunder; or, if no such list is attached, I represent that there are no such Prior Inventions. If, in the course of my Relationship with the Company, I incorporate into a Company product, process or machine a Prior Invention owned by me or in which I have an interest, the Company is hereby granted and shall have a non-exclusive, royalty-free, irrevocable, perpetual, worldwide license (with the right to sublicense) to make, have made, copy, modify, make derivative works of, use, sell and otherwise distribute such Prior Invention as part of or in connection with such product, process or machine.

(b) **Assignment of Inventions.** I agree that I will promptly make full written disclosure to Company, will hold in trust for the sole right and benefit of the Company, and hereby assign to Company, or its designee, all my right, title and interest throughout the world in and to any and all inventions related to the Company's technology or development programs as currently operated or contemplated, original works of authorship, developments, concepts, know-how, improvements or trade secrets, whether or not patentable or registrable under copyright or similar laws, which I may solely or jointly conceive or develop or reduce to practice, or cause to be conceived or developed or reduced to practice, during the period of time in which I am employed by the Company (collectively referred to as "Inventions"), except as provided in Exhibit A. I further acknowledge that all inventions, original works of authorship, developments, concepts, know-how, improvements or trade secrets which are made by me (solely or jointly with others) within the scope of and directly related to Company's technology or development programs as currently operated or contemplated and during the period of my Relationship with the Company are "works made for hire" (to the greatest extent permitted by applicable law) and are compensated by my salary (if I am an employee), unless regulated otherwise by the mandatory law of the State of New York.

(c) **Maintenance of Records.** I agree to keep and maintain adequate and current written records of all Inventions made by me (solely or jointly with others) during the term of my Relationship with the Company. The records may be in the form of notes, sketches, drawings, flow charts, electronic data or recordings, laboratory notebooks, and any other format. The records will be available to and remain the sole property of the Company at all times. I agree not to remove such records from the Company's place of business except as expressly permitted by Company policy which may, from time to time, be revised at the sole election of the Company for the purpose of furthering the Company's business. I agree to return all such records (including any copies thereof) to Company at the time of termination of my Relationship with the Company as provided for in Section 6.

(d) **Patent and Copyright Rights.** I agree to assist Company, or its designee, at its expense, in every proper way to secure Company, or its designee's, rights in the Inventions and any copyrights, patents, trademarks, mask work rights, moral rights, or other intellectual property rights relating thereto in any and all countries, including the disclosure to Company, or its designee of all pertinent information and data with respect thereto, the execution of all applications, specifications, oaths, assignments, recordations, and all other instruments which Company or its designee shall deem necessary in order to apply for, obtain, maintain and transfer such rights and in order to assign and convey to Company or its designee and any successors, assigns and nominees the sole and exclusive rights, title and interest in and to such Inventions, and any copyrights, patents, mask work rights or other intellectual property rights relating thereto. I further agree that my obligation to execute or cause to be executed, when it is in my power to do so, any such instrument or papers shall continue after the termination of this Agreement until the expiration of the last such intellectual property right to expire in any country of the world. If the Company or its designee is unable because of my mental or physical incapacity or unavailability or for any other reason to secure my signature to apply for or to pursue any application for any United States or foreign patents, copyright, mask works, or other registrations covering Inventions or original works of authorship assigned to Company or its designee as above, then I hereby irrevocably designate and appoint Company and its duly authorized officers and agents as my agent and attorney in fact, to act for and in my behalf and stead to execute and file any such applications and to do all other lawfully permitted acts to further the application for, prosecution, issuance, maintenance or transfer of letters patent, copyright or other registrations thereon with the same legal force and effect as if originally executed by me. I hereby waive and irrevocably quitclaim to Company or its designee any and all claims, which I now or hereafter have for infringement of any and all proprietary rights assigned to Company or such designee.

6. **Company Property; Returning Company Documents.** I acknowledge and agree that I have no expectation of privacy with respect to the Company's telecommunications, networking or information processing systems (including, without limitation, stored company files, e-mail messages and voice messages) and that my activity and any files or messages on or using any of those systems may be monitored at any time without notice. I further agree that any property situated on the Company's premises and owned by the Company, including disks and other storage media, filing cabinets or other work areas, is subject to inspection by Company personnel at any time with or without notice. I agree that, at the time of termination of my Relationship with the Company, I will deliver to the Company (and will not keep in my possession, recreate or deliver to anyone else) any and all devices, records, data, notes, reports, proposals, lists, correspondence, specifications, drawings, blueprints, sketches, laboratory notebooks, materials, flow charts, equipment, other documents or property, or reproductions of any of the aforementioned items, developed by me pursuant to the Relationship or otherwise belonging to the Company, its successors or assigns. In the event of the termination of the Relationship, I agree to sign and deliver the "Termination Certification" attached hereto as Exhibit C, however, my failure to sign and deliver the Termination Certificate shall in no way diminish my continuing obligations under this Agreement.

7. **Notification to Other Parties.**

(a) **Employees**. In the event that I leave the employ of the Company, I hereby consent to notification by the Company to my new employer about my rights and obligations under this Agreement.

(b) **Consultants.** I hereby grant consent to notification by the Company to any other parties besides the Company with whom I maintain a consulting or employment relationship, including parties with whom such relationship commences after the effective date of this Agreement, about my rights and obligations under this Agreement.

8. **Solicitation of Employees, Consultants and Other Parties.** I agree that during the term of my Relationship with the Company, and for a period of Twenty Four (24) months immediately following the termination of my Relationship with the Company for any reason, whether with or without cause, I shall not either directly or indirectly solicit, induce, recruit or encourage any of the Company's employees or consultants to terminate their relationship with the Company, or attempt to solicit, induce, recruit, encourage or take away employees or consultants of the Company, either for myself or for any other person or entity. Further, during my Relationship with the Company and at any time following termination of my Relationship with the Company for any reason, with or without cause, I shall not use any Confidential Information of the Company to attempt to negatively influence any of the Company's clients or customers from purchasing Company products or services or to solicit or influence or attempt to influence any client, customer or other person either directly or indirectly, to direct his or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company.

9. **Representations and Covenants.**

(a) **Facilitation of Agreement.** I agree to execute promptly any proper oath or verify any proper document required to carry out the terms of this Agreement upon the Company's written request to do so.

(b) **Conflicts.** I knowingly represent that my performance of all the terms of this Agreement does not and will not breach any agreement I have entered into, or will enter into with any third party, including without limitation any agreement to keep in confidence proprietary information acquired by me in confidence or in trust prior to commencement of my Relationship with the Company. I agree not to enter into any written or oral agreement that conflicts with the provisions of this Agreement.

(c) **Voluntary Execution.** I certify and acknowledge that I have carefully read all of the provisions of this Agreement and that I understand and will fully and faithfully comply with such provisions.

10. **General Provisions.**

(a) **Governing Law.** The validity, interpretation, construction and performance of this Agreement shall be governed by the laws of the State of New York, without giving effect to the principles of conflict of laws.

(b) **Entire Agreement.** This Agreement sets forth the entire agreement and understanding between the Company and me relating to the subject matter herein and merges all prior discussions between us. No modification or amendment to this Agreement, nor any waiver of any rights under this Agreement, will be effective unless in writing signed by both parties. Any subsequent change or changes in my duties, obligations, rights or compensation will not affect the validity or scope of this Agreement.

(c) **Severability.** If one or more of the provisions in this Agreement are deemed void by law, then the remaining provisions will continue in full force and effect.

(d) **Successors and Assigns.** This Agreement will be binding upon my heirs, executors, administrators and other legal representatives, and my successors and assigns, including, any successor entity, and will be for the benefit of the Company, its successors, and its assigns.

(e) **Survival.** The provisions of this Agreement shall survive the termination of the Relationship and the assignment of this Agreement by the Company to any successor in interest or other assignee.

(f) **Remedies**. I acknowledge and agree that violation of this Agreement by me may cause the Company irreparable harm, and therefore agree that the Company will be entitled to seek relief in court, including but not limited to temporary restraining orders, preliminary injunctions and permanent injunctions without the necessity of posting a bond or other security and in addition to and without prejudice to any other right and remedies that the Company may have for a breach of this Agreement.

(g) **ADVICE OF COUNSEL.** I ACKNOWLEDGE THAT, IN EXECUTING THIS AGREEMENT, I HAVE HAD THE OPPORTUNITY TO SEEK THE ADVICE OF INDEPENDENT LEGAL COUNSEL, AND I HAVE READ AND UNDERSTOOD ALL OF THE TERMS AND PROVISIONS OF THIS AGREEMENT. THIS AGREEMENT SHALL NOT BE CONSTRUED AGAINST ANY PARTY BY REASON OF THE DRAFTING OR PREPARATION HEREOF.

[Signature Page Follows]

The parties have executed this Confidentiality and Inventions Assignment Agreement on the respective dates set forth below:

COMPANY:	EMPLOYEE:
ACTINIUM PHARMACEUTICALS, INC.	**DR. NITYA G. RAY**
By: /s/ Sandesh Seth	Signature: /s/ Nitya G. Ray
Name: Sandesh Seth	Date: May 26, 2017
Title: Executive Chairman	
Date: May 26, 2017	

EXHIBIT A

LIST OF PRIOR INVENTIONS
AND ORIGINAL WORKS OF AUTHORSHIP
EXCLUDED UNDER SECTION 3

___ No inventions or improvements

___ Additional Sheets Attached

Signature of Employee:_____

Print Name of Employee:_____

Date:_____

EXHIBIT B

LIST OF PRIOR AGREEMENTS

Name of Agreement	Parties to Agreement	Restrictions(s)

Employee's Signature: _____

Date: _____

EXHIBIT C

TERMINATION CERTIFICATION

This is to certify that I do not have in my possession, nor have I failed to return, any devices, records, data, notes, reports, proposals, lists, correspondence, specifications, drawings, blueprints, sketches, laboratory notebooks, flow charts, materials, equipment, other documents or property, or copies or reproductions of any aforementioned items belonging to Actinium Pharmaceuticals, Inc., its subsidiaries, affiliates, successors or assigns (together the "Company").

I further certify that I have complied with all the terms of the Company's Confidential Information and Invention Assignment Agreement signed by me, including the reporting of any inventions and original works of authorship (as defined therein), conceived or made by me (solely or jointly with others) covered by that agreement.

I further agree that, in compliance with the Confidential Information and Invention Assignment Agreement, I will preserve as confidential all trade secrets, confidential knowledge, data or other proprietary information relating to products, processes, know-how, designs, formulas, developmental or experimental work, computer programs, data bases, other original works of authorship, customer lists, business plans, financial information or other subject matter pertaining to any business of the Company or any of its employees, clients, consultants or licensees.

I further agree that for twelve (12) months from the date of this Certificate, I shall not either directly or indirectly solicit, induce, recruit or encourage any of the Company's employees or consultants to terminate their relationship with the Company, or attempt to solicit, induce, recruit, encourage or take away, hire, or otherwise engage the services of employees or consultants of the Company, either for myself or for any other person or entity. Further, I shall not at any time use any Confidential Information of the Company to negatively influence any of the Company's clients or customers from purchasing Company products or services or to solicit or influence or attempt to influence any client, customer or other person either directly or indirectly, to direct his or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company.

Date: _____

_____
(Employee's Signature)

_____
(Type/Print Employee's Name)

Exhibit 10.5

ACTINIUM PHARMACEUTICALS, INC.

Common Stock
(par value $0.001 per share)

Amended and Restated At-the-Market Market Issuance Sales Agreement

July 3, 2017

FBR Capital Markets & Co.
1300 North 17th Street
Suite 1400
Arlington, Virginia 22209

MLV & Co. LLC
299 Park Avenue, 7th Floor
New York, NY 10171

JonesTrading Institutional Services LLC
780 Third Avenue
New York, NY 10017

Ladies and Gentlemen:

Actinium Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and MLV & Co. LLC ("MLV"), are parties to that certain At-the-Market Issuance Sales Agreement dated March 24, 2014 (the "Original Sales Agreement"). Together with FBR Capital Markets & Co. ("FBR") and JonesTrading Institutional Services LLC ("JonesTrading"; each of FBR, MLV and JonesTrading individually an "Agent" and collectively, the "Agents"), the Company and the Agents desire to amend and restate the Original Sales Agreement with this agreement (the "Agreement"), and hereby agree as follows:

1. Issuance and Sale of Shares. The Company agrees that, from time to time during the term of this Agreement, on the terms and subject to the conditions set forth herein, it may issue and sell through the Agents, shares (the "Placement Shares") of the Company's common stock, par value $0.001 per share (the "Common Stock"), *provided however,* that in no event shall the Company issue or sell through the Agents such number of Placement Shares that (a) exceeds the number of shares of Common Stock registered on the effective Registration Statement (as defined below) pursuant to which the offering is being made, or (b) exceeds the number of authorized but unissued shares of Common Stock (the lesser of (a) and (b), the "Maximum Amount"). Notwithstanding anything to the contrary contained herein, the parties hereto agree that compliance with the limitations set forth in this Section 1 on the number of Placement Shares issued and sold under this Agreement shall be the sole responsibility of the Company and that the Agents shall have no obligation in connection with such compliance. The issuance and sale of Placement Shares through the Agents will be effected pursuant to the Registration Statement (as defined below), although nothing in this Agreement shall be construed as requiring the Company to use the Registration Statement to issue any Placement Shares.

The Company has filed, in accordance with the provisions of the Securities Act of 1933, as amended, and the rules and regulations thereunder (the "Securities Act"), with the Securities and Exchange Commission (the "Commission"), a registration statement on Form S-3 (File No. 333-194768) (the "Current Registration Statement"), including a base prospectus relating to certain securities, including the Placement Shares to be issued from time to time by the Company, and which incorporates by reference documents that the Company has filed or will file in accordance with the provisions of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder (the "Exchange Act"). The Company has prepared a prospectus supplement specifically relating to the Placement Shares (the "Prospectus Supplement") to the base prospectus included as part of such registration statement. The Company will furnish to the Agents, for use by the Agents, copies of the prospectus included as part of such registration statement, as supplemented by the Prospectus Supplement, relating to the Placement Shares. Except where the context otherwise requires, such registration statement, and any post-effective amendment thereto, including all documents filed as part thereof or incorporated by reference therein, and including any information contained in a Prospectus (as defined below) subsequently filed with the Commission pursuant to Rule 424(b) under the Securities Act or deemed to be a part of such registration statement pursuant to Rule 430B of the Securities Act or any subsequent registration statement on Form S-3 filed pursuant to Rule 415(a)(6) under the Securities Act by the Company to cover any securities registered pursuant the Current Registration Statement, including any Placement Shares, as a result of the end of the three-year period described in Rule 415(a)(5) of the Securities Act, is herein called the "Registration Statement." The base prospectus, including all documents incorporated or deemed incorporated therein by reference to the extent such information has not been superseded or modified in accordance with Rule 412 under the Securities Act (as qualified by Rule 430B(g) of the Securities Act), included in the Registration Statement, as it may be supplemented by the Prospectus Supplement, in the form in which such prospectus and/or Prospectus Supplement have most recently been filed by the Company with the Commission pursuant to Rule 424(b) under the Securities Act, is herein called the "Prospectus." Any reference herein to the Registration Statement, the Prospectus or any amendment or supplement thereto shall be deemed to refer to and include the documents incorporated or deemed incorporated by reference therein, and any reference herein to the terms "amend," "amendment" or "supplement" with respect to the Registration Statement or the Prospectus shall be deemed to refer to and include the filing after the execution hereof of any document with the Commission deemed to be incorporated by reference therein (the "Incorporated Documents").

For purposes of this Agreement, all references to the Registration Statement, the Prospectus or to any amendment or supplement thereto shall be deemed to include the most recent copy filed with the Commission pursuant to its Electronic Data Gathering Analysis and Retrieval System, or if applicable, the Interactive Data Electronic Application system when used by the Commission (collectively, "EDGAR").

2. Placements. Each time that the Company wishes to issue and sell Placement Shares hereunder (each, a "Placement"), it will notify an Agent (the "Designated Agent") by email notice (or other method mutually agreed to in writing by the Parties) of the number of Placement Shares, the time period during which sales are requested to be made, any limitation on the number of Placement Shares that may be sold in any one day and any minimum price below which sales may not be made (a "Placement Notice"), the form of which is attached hereto as Schedule 1. The Placement Notice shall originate from any of the individuals from the Company set forth on Schedule 3 (with a copy to each of the other individuals from the Company listed on such schedule), and shall be addressed to each of the individuals from the Designated Agent set forth on Schedule 3, as such Schedule 3 may be amended from time to time. Provided that the Company is otherwise in compliance with the terms of this Agreement, the Placement Notice shall be effective immediately upon receipt by the Designated Agent unless and until (i) the Designated Agent declines to accept the terms contained therein for any reason, in its sole discretion, (ii) the entire amount of the Placement Shares thereunder has been sold, (iii) the Company suspends or terminates the Placement Notice or (iv) this Agreement has been terminated under the provisions of Section 13. The amount of any discount, commission or other compensation to be paid by the Company to the Designated Agent in connection with the sale of the Placement Shares shall be calculated in accordance with the terms set forth in Schedule 2. It is expressly acknowledged and agreed that neither the Company nor the Designated Agent will have any obligation whatsoever with respect to a Placement or any Placement Shares unless and until the Company delivers a Placement Notice to the Designated Agent and the Designated Agent does not decline such Placement Notice pursuant to the terms set forth above, and then only upon the terms specified therein and herein. In the event of a conflict between the terms of Sections 2 or 3 of this Agreement and the terms of a Placement Notice, the terms of the Placement Notice will control.

3. Sale of Placement Shares by the Agents. Subject to the terms and conditions of this Agreement, for the period specified in a Placement Notice, the Designated Agent will use its commercially reasonable efforts consistent with its normal trading and sales practices and applicable state and federal laws, rules and regulations and the rules of such national securities exchange that the Company's Common Stock is listed on (the "Exchange"), to sell the Placement Shares up to the amount specified in, and otherwise in accordance with the terms of, such Placement Notice. The Designated Agent will provide written confirmation to the Company no later than the opening of the Trading Day (as defined below) immediately following the Trading Day on which it has made sales of Placement Shares hereunder setting forth the number of Placement Shares sold on such day, the compensation payable by the Company to the Designated Agent pursuant to Section 2 with respect to such sales, and the Net Proceeds (as defined below) payable to the Company, with an itemization of the deductions made by the Designated Agent (as set forth in Section 5(b)) from the gross proceeds that it receives from such sales. Subject to the terms of a Placement Notice, the Designated Agent may sell Placement Shares by any method permitted by law deemed to be an "at the market offering" as defined in Rule 415 of the Securities Act. "Trading Day" means any day on which Common Stock is purchased and sold on the Exchange.

4. Suspension of Sales. The Company or the Designated Agent may, upon notice to the other party in writing (including by email correspondence to each of the individuals of the other party set forth on Schedule 3, if receipt of such correspondence is actually acknowledged by any of the individuals to whom the notice is sent, other than via auto-reply) or by telephone (confirmed immediately by verifiable facsimile transmission or email correspondence to each of the individuals of the other party set forth on Schedule 3), suspend any sale of Placement Shares; *provided, however*, that such suspension shall not affect or impair any party's obligations with respect to any Placement Shares sold hereunder prior to the receipt of such notice. While a suspension is in effect, any obligation under Sections 7(l), 7(m), and 7(n) with respect to the delivery of certificates, opinions, or comfort letters to the Agents, shall be waived; *provided, however*, that such waiver shall not apply for the Representation Date (as defined below) occurring on the date that the Company files its annual report on Form 10-K. Each of the parties agrees that no such notice under this Section 4 shall be effective against any other party unless it is made to one of the individuals named on Schedule 3 hereto, as such Schedule may be amended from time to time.

5. Sale and Delivery to the Designated Agent; Settlement.

a. Sale of Placement Shares. On the basis of the representations and warranties herein contained and subject to the terms and conditions herein set forth, upon the Designated Agent's acceptance of the terms of a Placement Notice, and unless the sale of the Placement Shares described therein has been declined, suspended, or otherwise terminated in accordance with the terms of this Agreement, the Designated Agent, for the period specified in the Placement Notice, will use its commercially reasonable efforts consistent with its normal trading and sales practices to sell such Placement Shares up to the amount specified in, and otherwise in accordance with the terms of, such Placement Notice. The Company acknowledges and agrees that (i) there can be no assurance that the Designated Agent will be successful in selling Placement Shares, (ii) the Designated Agent will incur no liability or obligation to the Company or any other person or entity if it does not sell Placement Shares for any reason other than a failure by the Designated Agent to use its commercially reasonable efforts consistent with its normal trading and sales practices and applicable law and regulations to sell such Placement Shares as required under this Agreement and (iii) the Designated Agent shall be under no obligation to purchase Placement Shares on a principal basis pursuant to this Agreement, except as otherwise agreed by the Designated Agent and the Company.

b. Settlement of Placement Shares. Unless otherwise specified in the applicable Placement Notice, settlement for sales of Placement Shares will occur on the third (3rd) Trading Day (or such earlier day as is industry practice for regular-way trading) following the date on which such sales are made (each, a "Settlement Date"). The amount of proceeds to be delivered to the Company on a Settlement Date against receipt of the Placement Shares sold (the "Net Proceeds") will be equal to the aggregate sales price received by the Designated Agent for the Placement Shares, after deduction for (i) the Designated Agent's commission, discount or other compensation for such sales payable by the Company pursuant to Section 2 hereof, and (ii) any transaction fees imposed by any governmental or self-regulatory organization in respect of such sales.

c. Delivery of Placement Shares. On or before each Settlement Date, the Company will, or will cause its transfer agent to, electronically transfer the Placement Shares being sold by crediting the Designated Agent's or its designee's account (provided the Designated Agent shall have given the Company written notice of such designee at least one Trading Day prior to the Settlement Date) at The Depository Trust Company through its Deposit and Withdrawal at Custodian System or by such other means of delivery as may be mutually agreed upon by the parties hereto which in all cases shall be freely tradable, transferable, registered shares in good deliverable form. On each Settlement Date, the Designated Agent will deliver the related Net Proceeds in same day funds to an account designated by the Company on, or prior to, the Settlement Date. The Company agrees that if the Company, or its transfer agent (if applicable), defaults in its obligation to deliver Placement Shares on a Settlement Date, through no fault of the Designated Agent, the Company agrees that in addition to and in no way limiting the rights and obligations set forth in Section 11(a) hereto, it will (i) hold the Designated Agent harmless against any loss, claim, damage, or reasonable, documented expense (including reasonable and documented legal fees and expenses), as incurred, arising out of or in connection with such default by the Company or its transfer agent (if applicable) and (ii) pay to the Designated Agent (without duplication) any commission, discount, or other compensation to which it would otherwise have been entitled absent such default.

d. Limitations on Offering Size. Under no circumstances shall the Company cause or request the offer or sale of any Placement Shares if, after giving effect to the sale of such Placement Shares, the aggregate number of Placement Shares sold pursuant to this Agreement would exceed the lesser of (A) together with all sales of Placement Shares under this Agreement, the Maximum Amount, (B) the amount available for offer and sale under the currently effective Registration Statement and (C) the amount authorized from time to time to be issued and sold under this Agreement by the Company's board of directors, a duly authorized committee thereof or a duly authorized executive committee, and notified to the Designated Agent in writing. Under no circumstances shall the Company cause or request the offer or sale of any Placement Shares pursuant to this Agreement at a price lower than the minimum price authorized from time to time by the Company's board of directors, a duly authorized committee thereof or a duly authorized executive committee, and notified to the Designated Agent in writing. Further, under no circumstances shall the Company cause or permit the aggregate offering amount of Placement Shares sold pursuant to this Agreement to exceed the Maximum Amount.

e. Sales Through Agents. The Company agrees that any offer to sell, any solicitation of an offer to buy, or any sales of Common Stock or any other equity security of the Company shall only be effected by or through an Agent, and only a single Agent, on any single given date, and in no event shall the Company request that more than one Agent sell Securities on the same day; provided however that (i) the foregoing limitation shall not apply to (A) exercise of any option, warrant, right or any conversion privilege set forth in the instruction governing such securities, (B) sales solely to employees, directors or security holders of the Company or its subsidiaries, or to a trustee or other person acquiring such securities for the accounts of such person and (ii) such limitation shall not apply (A) on any day during which no sales are made pursuant to this Agreement or (B) during a period in which the Company has notified the Agents that it will not sell Common Stock under this Agreement and (1) no Placement Notice is pending or (2) after a Placement Notice has been withdrawn.

6. Representations and Warranties of the Company. Except as disclosed in the Registration Statement or Prospectus (including the Incorporated Documents), the Company represents and warrants to, and agrees with each Agent that as of the date of this Agreement and as of each Applicable Time (as defined below), unless such representation, warranty or agreement specifies a different date or time:

a. Registration Statement and Prospectus. The Company and, assuming no act or omission on the part of the Agents that would make such statement untrue, the transactions contemplated by this Agreement meet the requirements for and comply with the conditions for the use of Form S-3 under the Securities Act. The Registration Statement has been filed with the Commission and has been declared effective under the Securities Act. The Prospectus will name FBR, MLV and JonesTrading as the agents in the section entitled "Plan of Distribution." The Company has not received, and has no notice of, any order of the Commission preventing or suspending the use of the Registration Statement, or threatening or instituting proceedings for that purpose. The Registration Statement and the offer and sale of Placement Shares as contemplated hereby meet the requirements of Rule 415 under the Securities Act and comply in all material respects with said Rule. Any statutes, regulations, contracts or other documents that are required to be described in the Registration Statement or the Prospectus or to be filed as exhibits to the Registration Statement have been so described or filed. Copies of the Registration Statement, the Prospectus, and any such amendments or supplements and all documents incorporated by reference therein that were filed with the Commission on or prior to the date of this Agreement have been delivered, or are available through EDGAR, to the Agents and their counsel. The Company has not distributed and, prior to the later to occur of each Settlement Date and completion of the distribution of the Placement Shares, will not distribute any offering material in connection with the offering or sale of the Placement Shares other than the Registration Statement and the Prospectus and any Issuer Free Writing Prospectus (as defined below) to which the Agents have consented, such consent not to be unreasonably withheld, conditioned or delayed. The Common Stock is currently listed on the Exchange. The Company has not, in the 12 months preceding the date hereof, received notice from the Exchange to the effect that the Company is not in compliance in all material respects with the listing or maintenance requirements of the Exchange. The Company has no reason to believe that it will not in the foreseeable future continue to be in compliance with all such listing and maintenance requirements.

b. No Misstatement or Omission. The Registration Statement, when it became effective, and the Prospectus, and any amendment or supplement thereto, on the date of such Prospectus or amendment or supplement, conformed and will conform in all material respects with the requirements of the Securities Act. At each Settlement Date, the Registration Statement and the Prospectus, as of such date, will conform in all material respects with the requirements of the Securities Act. The Registration Statement, when it became or becomes effective, did not, and will not, contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading. The Prospectus and any amendment and supplement thereto, on the date thereof and at each Applicable Time (defined below), did not or will not include an untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading. The documents incorporated by reference in the Prospectus or any Prospectus Supplement did not, and any further documents filed and incorporated by reference therein will not, when filed with the Commission, contain an untrue statement of a material fact or omit to state a material fact required to be stated in such document or necessary to make the statements in such document, in light of the circumstances under which they were made, not misleading. The foregoing shall not apply to statements in, or omissions from, any such document made in reliance upon, and in conformity with, information furnished to the Company by an Agent specifically for use in the preparation thereof.

c. Conformity with Securities Act and Exchange Act. The Registration Statement, the Prospectus, any Issuer Free Writing Prospectus or any amendment or supplement thereto, and the Incorporated Documents, when such documents were or are filed with the Commission under the Securities Act or the Exchange Act or became or become effective under the Securities Act, as the case may be, conformed or will conform in all material respects with the requirements of the Securities Act and the Exchange Act, as applicable.

d. Financial Information. The consolidated financial statements of the Company included or incorporated by reference in the Registration Statement and the Prospectus, together with the related notes and schedules, present fairly, in all material respects, the consolidated financial position of the Company and the Subsidiaries (as defined below) as of the dates indicated and the consolidated statement of operations, consolidated statement of cash flows and consolidated statement of stockholders' equity (deficit) of the Company for the periods specified and have been prepared in compliance in all material respects with the requirements of the Securities Act and Exchange Act, as applicable, and in conformity with generally accepted accounting principles ("GAAP") in the United States as in effect as of the time of filing applied on a consistent basis (except for such adjustments to accounting standards and practices as are noted therein) during the periods involved (subject, in the case of unaudited financial statements, to normal recurring adjustments and to the extent they may exclude footnotes or may be condensed or summarized statements); the other financial and statistical data with respect to the Company and the Subsidiaries contained or incorporated by reference in the Registration Statement and the Prospectus, are accurately and fairly presented and prepared on a basis consistent with the financial statements and books and records of the Company; there are no financial statements (historical or pro forma) that are required to be included or incorporated by reference in the Registration Statement, or the Prospectus that are not included or incorporated by reference as required; the Company and the Subsidiaries do not have any material liabilities or obligations, direct or contingent (including any off balance sheet obligations), not described in the Registration Statement, and the Prospectus which are required to be described in the Registration Statement or Prospectus; and all disclosures contained or incorporated by reference in the Registration Statement and the Prospectus, if any, regarding "non-GAAP financial measures" (as such term is defined by the rules and regulations of the Commission) comply in all material respects with Regulation G of the Exchange Act and Item 10 of Regulation S-K under the Securities Act, to the extent applicable.

e. Conformity with EDGAR Filing. The Prospectus delivered to the Agents for use in connection with the sale of the Placement Shares pursuant to this Agreement will be identical to the versions of the Prospectus created to be transmitted to the Commission for filing via EDGAR, except to the extent permitted by Regulation S-T.

f. Organization. The Company and any subsidiary that is a significant subsidiary (as such term is defined in Rule 1-02 of Regulation S-X promulgated by the Commission) (each, a "Subsidiary", collectively, the "Subsidiaries"), are, and will be, duly organized, validly existing as a corporation and in good standing under the laws of their respective jurisdictions of organization. The Company and the Subsidiaries are, and will be, duly licensed or qualified as a foreign corporation for transaction of business and in good standing under the laws of each other jurisdiction in which their respective ownership or lease of property or the conduct of their respective businesses requires such license or qualification, and have all corporate power and authority necessary to own or hold their respective properties and to conduct their respective businesses as described in the Registration Statement and the Prospectus, except where the failure to be so qualified or in good standing or have such power or authority would not, individually or in the aggregate, have a material adverse effect or would reasonably be expected to have a material adverse effect on the assets, business, operations, earnings, properties, condition (financial or otherwise), prospects, stockholders' equity or results of operations of the Company and the Subsidiaries taken as a whole, or prevent the consummation of the transactions contemplated hereby (a "Material Adverse Effect").

g. Subsidiaries. As of the date hereof, the Company's only Subsidiaries are set forth on Schedule 6(g). The Company owns directly or indirectly, all of the equity interests of the Subsidiaries free and clear of any lien, charge, security interest, encumbrance, right of first refusal or other restriction, and all the equity interests of the Subsidiaries are validly issued and are fully paid, nonassessable and free of preemptive and similar rights.

h. No Violation or Default. Neither the Company nor any Subsidiary is (i) in violation of its charter or by-laws or similar organizational documents; (ii) in default, and no event has occurred that, with notice or lapse of time or both, would constitute such a default, in the due performance or observance of any term, covenant or condition contained in any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company or any Subsidiary is a party or by which the Company or any Subsidiary is bound or to which any of the property or assets of the Company or any Subsidiary is subject; or (iii) in violation of any law or statute or any judgment, order, rule or regulation of any court or arbitrator or governmental or regulatory authority having jurisdiction over the Company, except, in the case of each of clauses (ii) and (iii) above, for any such violation or default that would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. To the Company's knowledge, no other party under any material contract or other agreement to which it or any Subsidiary is a party is in default in any respect thereunder where such default would reasonably be expected to have a Material Adverse Effect.

i. No Material Adverse Effect. Since the date of the most recent financial statements of the Company included or incorporated by reference in the Registration Statement and Prospectus, there has not been (other than those noted below in this paragraph) (i) any Material Adverse Effect, or any development involving a prospective Material Adverse Effect, in or affecting the business, properties, management, condition (financial or otherwise), results of operations, or prospects of the Company and the Subsidiaries taken as a whole, (ii) any transaction which is material to the Company and the Subsidiaries taken as a whole, (iii) any obligation or liability, direct or contingent (including any off-balance sheet obligations), incurred by the Company or the Subsidiaries, which is material to the Company and the Subsidiaries taken as a whole, (iv) any material change in the capital stock (other than (A) the grant of additional options or other awards under or outside the Company's existing stock incentive plans, (B) changes in the number of outstanding shares of Common Stock of the Company due to the issuance of shares upon the exercise or conversion of securities exercisable for, or convertible into, Common Stock outstanding on the date hereof, (C) as a result of the issuance of Placement Shares, (D) any repurchases of capital stock of the Company, (E) as described in a proxy statement filed on Schedule 14A or a Registration Statement on Form S-4, or (F) otherwise publicly announced) or outstanding long-term indebtedness of the Company or the Subsidiaries or (v) any dividend or distribution of any kind declared, paid or made on the capital stock of the Company or any Subsidiary, other than in each case above (1) in the ordinary course of business. (2) as otherwise disclosed in the Registration Statement or Prospectus or (3) where such matter, item, change, or development, individually or in the aggregate, would not make the statements in the Registration Statement or the Prospectus contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading.

j. Capitalization. The issued and outstanding shares of capital stock of the Company have been validly issued, are fully paid and non-assessable and, other than as disclosed in the Registration Statement or the Prospectus, are not subject to any preemptive rights, rights of first refusal or similar rights. The Company has an authorized, issued and outstanding capitalization as set forth in the Registration Statement and the Prospectus as of the dates referred to therein (other than (i) the grant of additional options or other awards under the Company's existing stock incentive plans, (ii) changes in the number of outstanding Common Stock of the Company due to the issuance of shares upon the exercise or conversion of securities exercisable for, or convertible into, Common Stock outstanding on the date hereof, (iii) as a result of the issuance of Placement Shares, or (iv) any repurchases of capital stock of the Company) and such authorized capital stock conforms to the description thereof set forth in the Registration Statement and the Prospectus. The description of the Common Stock in the Registration Statement and the Prospectus is complete and accurate in all material respects. As of the date referred to therein, the Company did not have material outstanding any options to purchase, or any rights or warrants to subscribe for, or any securities or obligations convertible into, or exchangeable for, or any contracts or commitments to issue or sell, any shares of capital stock or other securities.

k. S-3 Eligibility. (i) At the time of filing the Registration Statement and (ii) at the time of the most recent amendment thereto for the purposes of complying with Section 10(a)(3) of the Securities Act (whether such amendment was by post-effective amendment, incorporated report filed pursuant to Section 13 or 15(d) of the Exchange Act or form of prospectus), the Company met the then applicable requirements for use of Form S-3 under the Securities Act, including compliance with General Instruction I.B.1 of Form S-3.

l. Authorization; Enforceability. The Company has full legal right, power and authority to enter into this Agreement and perform the transactions contemplated hereby. This Agreement has been duly authorized, executed and delivered by the Company and is a legal, valid and binding agreement of the Company enforceable against the Company in accordance with its terms, except to the extent that (i) enforceability may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally and by general equitable principles and (ii) the indemnification and contribution provisions of Section 11 hereof may be limited by federal or state securities laws and public policy considerations in respect thereof.

m. Authorization of Placement Shares. The Placement Shares, when issued and delivered pursuant to the terms approved by the board of directors of the Company or a duly authorized committee thereof, or a duly authorized executive officer, against payment therefor as provided herein, will be duly and validly authorized and issued and fully paid and nonassessable, free and clear of any pledge, lien, encumbrance, security interest or other claim (other than any pledge, lien, encumbrance, security interest or other claim arising from an act or omission of an Agent or a purchaser), including any statutory or contractual preemptive rights, resale rights, rights of first refusal or other similar rights, and will be registered pursuant to Section 12 of the Exchange Act. The Placement Shares, when issued, will conform in all material respects to the description thereof set forth in or incorporated into the Prospectus.

n. No Consents Required. No consent, approval, authorization, order, registration or qualification of or with any court or arbitrator or any governmental or regulatory authority having jurisdiction over the Company is required for the execution, delivery and performance by the Company of this Agreement, and the issuance and sale by the Company of the Placement Shares as contemplated hereby, except for the registration of the Placement Shares under the Securities Act and such consents, approvals, authorizations, orders and registrations or qualifications as may be required under applicable state securities laws or by the by-laws and rules of the Financial Industry Regulatory Authority ("FINRA") or the Exchange, including any notices that may be required by Exchange, in connection with the sale of the Placement Shares by the Agents.

o. No Preferential Rights. (i) No person, as such term is defined in Rule 1-02 of Regulation S-X promulgated under the Securities Act (each, a "Person"), has the right, contractual or otherwise, to cause the Company to issue or sell to such Person any Common Stock or shares of any other capital stock or other securities of the Company (other than upon the exercise of options or warrants to purchase Common Stock or upon the exercise of options that may be granted, or issuances of Common Stock or other equity awards, from time to time under or outside of the Company's stock incentive plans), (ii) no Person has any preemptive rights, rights of first refusal, or any other rights (whether pursuant to a "poison pill" provision or otherwise) to purchase any Common Stock or shares of any other capital stock or other securities of the Company from the Company which have not been duly waived with respect to the offering contemplated hereby, (iii) no Person has the right to act as an underwriter or as a financial advisor to the Company in connection with the offer and sale of the Common Stock as contemplated by this Agreement, and (iv) no Person has the right, contractual or otherwise, to require the Company to register under the Securities Act any Common Stock or shares of any other capital stock or other securities of the Company, or to include any such shares or other securities in the Registration Statement or the offering contemplated thereby, whether as a result of the filing or effectiveness of the Registration Statement or the sale of the Placement Shares as contemplated thereby or otherwise, except for those shares and securities currently subject to registration statements on file with the Commission.

p. Independent Public Accountant. GBH CPAs, PC (the "Accountant"), whose report on the consolidated financial statements of the Company is filed with the Commission as part of the Company's most recent Annual Report on Form 10-K filed with the Commission and incorporated into the Registration Statement, are and, during the periods covered by their report, were independent public accountants within the meaning of the Securities Act and the Public Company Accounting Oversight Board (United States). To the Company's knowledge the Accountant is not in violation of the auditor independence requirements of the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act") with respect to the Company.

q. Enforceability of Agreements. All agreements between the Company and third parties expressly referenced in the Prospectus, other than such agreements that have expired by their terms or whose termination is disclosed in documents filed by the Company on EDGAR, are legal, valid and binding obligations of the Company enforceable in accordance with their respective terms, except to the extent that (i) enforceability may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally and by general equitable principles and (ii) the indemnification provisions of certain agreements may be limited by federal or state securities laws or public policy considerations in respect thereof, and except for any unenforceability that, individually or in the aggregate, would not reasonably be expected to have a Material Adverse Effect.

r. No Litigation. There are no legal, governmental or regulatory actions, suits or proceedings pending, nor, to the Company's knowledge, any legal, governmental or regulatory investigations, to which the Company or a Subsidiary is a party or to which any property of the Company or any Subsidiary is the subject that, individually or in the aggregate, if determined adversely to the Company or any Subsidiary, would reasonably be expected to have a Material Adverse Effect or materially and adversely affect the ability of the Company to perform its obligations under this Agreement; to the Company's knowledge, no such actions, suits or proceedings are threatened by any governmental or regulatory authority or threatened by others that, individually or in the aggregate, if determined adversely to the Company or any Subsidiary, would reasonably be expected to have a Material Adverse Effect; and there are no current or pending legal, governmental or regulatory actions, suits or proceedings or, to the knowledge of the Company, investigations that are required under the Securities Act to be described in the Prospectus that are not described in the Prospectus including any Incorporated Document.

s. Licenses and Permits. The Company and the Subsidiaries possess or have obtained, all licenses, certificates, consents, orders, approvals, permits and other authorizations issued by, and have made all declarations and filings with, the appropriate federal, state, local or foreign governmental or regulatory authorities that are necessary for the ownership or lease of their respective properties or the conduct of their respective businesses as described in the Registration Statement and the Prospectus (the "Permits"), except where the failure to possess, obtain or make the same would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. Neither the Company nor any Subsidiary has received written notice of any proceeding relating to revocation or modification of any such Permit or has any reason to believe that such Permit will not be renewed in the ordinary course, except where the revocation, modification or failure to obtain the renewal of any such Permit would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

t. No Material Defaults. Neither the Company nor any Subsidiary has defaulted on any installment on indebtedness for borrowed money or on any rental on one or more long-term leases, which defaults, individually or in the aggregate, could reasonably be expected to have a Material Adverse Effect. The Company has not filed a report pursuant to Section 13(a) or 15(d) of the Exchange Act since the filing of its last Annual Report on Form 10-K, indicating that it (i) has failed to pay any dividend or sinking fund installment on preferred stock or (ii) has defaulted on any installment on indebtedness for borrowed money or on any rental on one or more long-term leases, which defaults, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect.

u. Certain Market Activities. Neither the Company, nor any Subsidiary, nor to the Company's knowledge any of their respective directors, officers or controlling persons has taken, directly or indirectly, any action designed, or that has constituted or would reasonably be expected to cause or result in, under the Exchange Act or otherwise, the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Placement Shares.

v. Broker/Dealer Relationships. Neither the Company nor any Subsidiary or any related entities (i) is required to register as a "broker" or "dealer" in accordance with the provisions of the Exchange Act or (ii) directly or indirectly through one or more intermediaries, controls or is a "person associated with a member" or "associated person of a member" (within the meaning set forth in the FINRA Manual).

w. No Reliance. The Company has not relied upon the Agents or legal counsel for the Agents for any legal, tax or accounting advice in connection with the offering and sale of the Placement Shares.

x. Taxes. The Company and the Subsidiaries have filed all federal, state, local and foreign tax returns which have been required to be filed and paid all taxes shown thereon through the date hereof, to the extent that such taxes have become due and are not being contested in good faith, except where the failure to do so would not reasonably be expected to have a Material Adverse Effect. Except as otherwise disclosed in or contemplated by the Registration Statement or the Prospectus, no tax deficiency has been determined adversely to the Company or any Subsidiary which has had, or would reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect. The Company has no knowledge of any federal, state or other governmental tax deficiency, penalty or assessment which has been asserted or threatened against it which could have a Material Adverse Effect.

y. Title to Real and Personal Property. The Company and the Subsidiaries have good and valid title in fee simple to all items of real property and good and valid title to all personal property (excluding Intellectual Property which is addressed below) described in the Registration Statement or Prospectus as being owned by them that are material to the businesses of the Company or such Subsidiary, in each case free and clear of all liens, encumbrances and claims, except those that (i) do not materially interfere with the use made and proposed to be made of such property by the Company and the Subsidiaries or (ii) would not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect. Any real property described in the Registration Statement or Prospectus as being leased by the Company and the Subsidiaries is held by them under valid, existing and enforceable leases, except those that (A) do not materially interfere with the use made or proposed to be made of such property by the Company or the Subsidiaries or (B) would not be reasonably expected, individually or in the aggregate, to have a Material Adverse Effect.

z. Intellectual Property. To the Company's knowledge, the Company and the Subsidiaries own or possess adequate enforceable rights to use all patents, patent applications, trademarks (both registered and unregistered), service marks, trade names, trademark registrations, service mark registrations, copyrights, licenses and know-how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures) (collectively, the "Intellectual Property"), necessary for the conduct of their respective businesses as conducted as of the date hereof, except to the extent that the failure to own or possess adequate rights to use such Intellectual Property would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; the Company and the Subsidiaries have not received any written notice of any claim of infringement or conflict which asserted Intellectual Property rights of others, which infringement or conflict, if the subject of an unfavorable decision, would reasonably be expected to result in a Material Adverse Effect; there are no pending, or to the Company's knowledge, threatened judicial proceedings or interference proceedings against the Company or its Subsidiaries challenging the Company's or any of its Subsidiary's rights in or to or the validity of the scope of any of the Company's or any Subsidiary's patents, patent applications or proprietary information, except for such right or claim that would not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Effect; to the Company's knowledge no other entity or individual has any right or claim in any of the Company's or any of its Subsidiary's patents, patent applications or any patent to be issued therefrom by virtue of any contract, license or other agreement entered into between such entity or individual and the Company or any Subsidiary or by any non-contractual obligation, other than by written licenses granted by the Company or any Subsidiary, except for such right or claim that would not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Effect; the Company and the Subsidiaries have not received any written notice of any claim challenging the rights of the Company or its Subsidiaries in or to any Intellectual Property owned, licensed or optioned by the Company or any Subsidiary which claim, if the subject of an unfavorable decision would result in a Material Adverse Effect.

aa. Environmental Laws. The Company and the Subsidiaries (i) are in compliance in all material respects with any and all applicable federal, state, local and foreign laws, rules, regulations, decisions and orders relating to the protection of human health and safety, the environment or hazardous or toxic substances or wastes, pollutants or contaminants (collectively, "Environmental Laws"); (ii) have received and are in compliance in all material respects with all permits, licenses or other approvals required of them under applicable Environmental Laws to conduct their respective businesses as described in the Registration Statement and the Prospectus; and (iii) have not received notice of any actual or potential liability for the investigation or remediation of any disposal or release of hazardous or toxic substances or wastes, pollutants or contaminants, except, in the case of any of clauses (i), (ii) or (iii) above, for any such failure to comply or failure to receive required permits, licenses, other approvals or liability as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

bb. Disclosure Controls. The Company maintains systems of internal accounting controls designed to provide reasonable assurance that (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain asset accountability; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. The Company is not aware of any material weaknesses in its internal control over financial reporting (other than as set forth in the Registration Statement or the Prospectus). Since the date of the latest audited financial statements of the Company included in the Prospectus, there has been no change in the Company's internal control over financial reporting that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting (other than as set forth in the Registration Statement or the Prospectus). The Company has established disclosure controls and procedures (as defined in Exchange Act Rules 13a-15 and 15d-15) for the Company and designed such disclosure controls and procedures to ensure that material information relating to the Company and the Subsidiaries is made known to the certifying officers by others within those entities, particularly during the period in which the Company's Annual Report on Form 10-K or Quarterly Report on Form 10-Q, as the case may be, is being prepared. The Company's certifying officers have evaluated the effectiveness of the Company's controls and procedures as of a date within 90 days prior to the filing date of the Form 10-K for the fiscal year most recently ended (such date, the "Evaluation Date"). The Company presented in its Form 10-K for the fiscal year most recently ended the conclusions of the certifying officers about the effectiveness of the disclosure controls and procedures based on their evaluations as of the most recent Evaluation Date. Since the most recent Evaluation Date, there have been no significant changes in the Company's internal controls (as such term is defined in Item 307(b) of Regulation S-K under the Securities Act) or, to the Company's knowledge, in other factors that could significantly adversely affect the Company's internal controls.

cc. Sarbanes-Oxley Act. There is and has been no failure on the part of the Company or, to the knowledge of the Company, any of the Company's directors or officers, in their capacities as such, to comply with any applicable provisions of the Sarbanes-Oxley Act and the rules and regulations promulgated thereunder. Each of the principal executive officer and the principal financial officer of the Company (or each former principal executive officer of the Company and each former principal financial officer of the Company as applicable) has made all certifications required by Sections 302 and 906 of the Sarbanes-Oxley Act with respect to all reports, schedules, forms, statements and other documents required to be filed by it or furnished by it to the Commission during the past 12 months. For purposes of the preceding sentence, "principal executive officer" and "principal financial officer" shall have the meanings given to such terms in the Exchange Act Rules 13a-15 and 15d-15.

dd. Finder's Fees. Neither the Company nor any Subsidiary has incurred any liability for any finder's fees, brokerage commissions or similar payments in connection with the transactions herein contemplated, except as may otherwise exist with respect to the Agents pursuant to this Agreement.

ee. Labor Disputes. No labor disturbance by or dispute with employees of the Company or any Subsidiary exists or, to the knowledge of the Company, is threatened which would reasonably be expected to result in a Material Adverse Effect.

ff. Investment Company Act. Neither the Company nor any Subsidiary is or, after giving effect to the offering and sale of the Placement Shares, will be an "investment company" or an entity "controlled" by an "investment company," as such terms are defined in the Investment Company Act of 1940, as amended (the "Investment Company Act").

gg. Operations. The operations of the Company and the Subsidiaries are and have been conducted at all times in compliance in all material respects with applicable financial record keeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all jurisdictions to which the Company or the Subsidiaries are subject, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the "Money Laundering Laws"), except as would not reasonably be expected to result in a Material Adverse Effect; and no action, suit or proceeding by or before any court or governmental agency having jurisdiction over the Company, authority or body or any arbitrator involving the Company or any Subsidiary with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened.

hh. Off-Balance Sheet Arrangements. There are no transactions, arrangements and other relationships between and/or among the Company, and/or, to the knowledge of the Company, any of its affiliates and any unconsolidated entity, including, but not limited to, any structured finance, special purpose or limited purpose entity (each, an "Off Balance Sheet Transaction") that could reasonably be expected to affect materially the Company's liquidity or the availability of or requirements for its capital resources, including those Off Balance Sheet Transactions described in the Commission's Statement about Management's Discussion and Analysis of Financial Conditions and Results of Operations (Release Nos. 33-8056; 34-45321; FR-61), required to be described in the Registration Statement or the Prospectus which have not been described as required.

ii. Underwriter Agreements. The Company is not a party to any agreement with an agent or underwriter for any other "at the market" or continuous equity transaction.

jj. ERISA. To the knowledge of the Company, (i) each material employee benefit plan, within the meaning of Section 3(3) of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), that is maintained, administered or contributed to by the Company or any of its affiliates for employees or former employees of the Company and the Subsidiaries has been maintained in material compliance with its terms and the requirements of any applicable statutes, orders, rules and regulations, including but not limited to ERISA and the Internal Revenue Code of 1986, as amended (the "Code"); (ii) no prohibited transaction, within the meaning of Section 406 of ERISA or Section 4975 of the Code, has occurred which would result in a material liability to the Company with respect to any such plan excluding transactions effected pursuant to a statutory or administrative exemption; (iii) and for each such plan that is subject to the funding rules of Section 412 of the Code or Section 302 of ERISA, no "accumulated funding deficiency" as defined in Section 412 of the Code has been incurred, whether or not waived, and the fair market value of the assets of each such plan (excluding for these purposes accrued but unpaid contributions) equals or exceeds the present value of all benefits accrued under such plan determined using reasonable actuarial assumptions other than, in the case of (i), (ii) and (iii) above, as would not reasonably be expected to have a Material Adverse Effect.

kk. Forward-Looking Statements. No forward-looking statement (within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act) (a "Forward-Looking Statement") contained in the Registration Statement and the Prospectus has been made or reaffirmed without a reasonable basis or has been disclosed other than in good faith. The Forward-Looking Statements incorporated by reference in the Registration Statement and the Prospectus from the Company's Annual Report on Form 10-K for the fiscal year most recently ended (i) except for any Forward-Looking Statement included in any financial statements and notes thereto, are within the coverage of the safe harbor for forward looking statements set forth in Section 27A of the Securities Act, Rule 175(b) under the Securities Act or Rule 3b-6 under the Exchange Act, as applicable, (ii) were made by the Company with a reasonable basis and in good faith and reflect the Company's good faith commercially reasonable best estimate of the matters described therein as of the respective dates on which such statements were made, and (iii) have been prepared in accordance with Item 10 of Regulation S-K under the Securities Act.

ll. Margin Rules. Neither the issuance, sale and delivery of the Placement Shares nor the application of the proceeds thereof by the Company as described in the Registration Statement and the Prospectus will violate Regulation T, U or X of the Board of Governors of the Federal Reserve System.

mm. Insurance. The Company and the Subsidiaries carry, or are covered by, insurance in such amounts and covering such risks as the Company and the Subsidiaries reasonably believe are adequate for the conduct of their business and as is customary for companies of similar size engaged in similar businesses in similar industries.

nn. No Improper Practices. (i) Neither the Company nor, to the Company's knowledge, the Subsidiaries, nor to the Company's knowledge, any of their respective executive officers has, in the past five years, made any unlawful contributions to any candidate for any political office (or failed fully to disclose any contribution in violation of law) or made any contribution or other payment to any official of, or candidate for, any federal, state, municipal, or foreign office or other person charged with similar public or quasi-public duty in violation of any law or of the character required to be disclosed in the Prospectus; (ii) to the Company's knowledge no relationship, direct or indirect, exists between or among the Company or, to the Company's knowledge, the Subsidiaries or any affiliate of any of them, on the one hand, and the directors, officers and stockholders of the Company or, the Subsidiaries, on the other hand, that is required by the Securities Act to be described in the Registration Statement and the Prospectus that is not so described; (iii) to the Company's knowledge no relationship, direct or indirect, exists between or among the Company or the Subsidiaries or any affiliate of them, on the one hand, and the directors, officers, stockholders or directors of the Company or, the Subsidiaries, on the other hand, that is required by the rules of FINRA to be described in the Registration Statement and the Prospectus that is not so described; (iv) there are no material outstanding loans or advances or material guarantees of indebtedness by the Company or, to the Company's knowledge, the Subsidiaries to or for the benefit of any of their respective officers or directors or any of the members of the families of any of them; and (v) to the Company's knowledge the Company has not offered, or caused any placement agent to offer, Common Stock to any person with the intent to influence unlawfully (A) a customer or supplier of the Company or the Subsidiaries to alter the customer's or supplier's level or type of business with the Company or the Subsidiaries or (B) a trade journalist or publication to write or publish favorable information about the Company or the Subsidiaries or any of their respective products or services, and, (vi) neither the Company nor the Subsidiaries nor, to the Company's knowledge, any employee or agent of the Company or the Subsidiaries has made any payment of funds of the Company or the Subsidiaries or received or retained any funds in violation of any law, rule or regulation (including, without limitation, the Foreign Corrupt Practices Act of 1977), which payment, receipt or retention of funds is of a character required to be disclosed in the Registration Statement or the Prospectus.

oo. [Reserved]

pp. No Misstatement or Omission in an Issuer Free Writing Prospectus. Each Issuer Free Writing Prospectus, as of its issue date and as of each Applicable Time (as defined in Section 25 below), did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the Registration Statement or the Prospectus, including any incorporated document deemed to be a part thereof that has not been superseded or modified. The foregoing sentence does not apply to statements in or omissions from any Issuer Free Writing Prospectus based upon and in conformity with written information furnished to the Company by an Agent specifically for use therein.

qq. No Conflicts. Neither the execution of this Agreement, nor the issuance, offering or sale of the Placement Shares, nor the consummation of any of the transactions contemplated herein and therein, nor the compliance by the Company with the terms and provisions hereof and thereof will conflict with, or will result in a breach of, any of the terms and provisions of, or has constituted or will constitute a default under, or has resulted in or will result in the creation or imposition of any lien, charge or encumbrance upon any property or assets of the Company pursuant to the terms of any contract or other agreement to which the Company is a party or to which any of the property or assets of the Company is subject, except (i) such conflicts, breaches or defaults as may have been waived and (ii) such conflicts, breaches and defaults that would not reasonably be expected to have a Material Adverse Effect; nor will such action result (x) in any violation of the provisions of the organizational or governing documents of the Company, or (y) in any material violation of the provisions of any statute or any order, rule or regulation applicable to the Company or of any court or of any federal, state or other regulatory authority or other government body having jurisdiction over the Company, except where such violation would not reasonably be expected to have a Material Adverse Effect.

rr. Compliance with Applicable Laws. The Company and the Subsidiaries: (A) are and at all times have been in compliance with all statutes, rules and regulations applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, marketing, labeling, promotion, sale, offer for sale, storage, import, export or disposal of any product under development, manufactured or distributed by the Company or the Subsidiaries ("Applicable Laws") except where the failure to be so in compliance would not reasonably be expected to result in a Material Adverse Effect, (b) have not received any Form 483 from the FDA, notice of adverse finding, warning letter, or other written correspondence or notice from the FDA, the European Medicines Agency (the "EMA"), or any other federal, state, local or foreign governmental or regulatory authority alleging or asserting material noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws ("Authorizations"), which would, individually or in the aggregate, reasonably be expected to result in a Material Adverse Effect; (C) possess all material Authorizations for the Company's current state of product development as disclosed in the Registration Statement, and such Authorizations are valid and in full force and effect and neither the Company nor the Subsidiaries is in material violation of any term of any such Authorizations; (D) have not received written notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from the FDA, the EMA, or any other federal, state, local or foreign governmental or regulatory authority or third party alleging that any Company product, operation or activity is in material violation of any Applicable Laws or Authorizations and has no knowledge that the FDA, the EMA, or any other federal, state, local or foreign governmental or regulatory authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding against the Company; (E) have not received notice that the FDA, EMA, or any other federal, state, local or foreign governmental or regulatory authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any material Authorizations and has no knowledge that the FDA, EMA, or any other federal, state, local or foreign governmental or regulatory authority is considering such action; and (F) have filed, obtained, maintained or submitted all reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations for the Company's current state of product development as disclosed in the registration Statement, except where the failure to file such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments would not result in a Material Adverse Effect, and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were materially complete and correct on the date filed (or were corrected or supplemented by a subsequent submission).

ss. Clinical Studies. All animal and other preclinical studies and clinical trials conducted by the Company or to the Company's knowledge on behalf of the Company were, and, if still pending are, to the Company's knowledge, being conducted in all material respects in compliance with all Applicable Laws and in accordance with experimental protocols, procedures and controls generally used by qualified experts in the preclinical study and clinical trials of new drugs and biologics as applied to comparable products to those being developed by the Company; the descriptions of the results of such preclinical studies and clinical trials contained in the Registration Statement and the Prospectus are accurate in all material respects, and, except as set forth in the Registration Statement and the Prospectus, the Company has no knowledge of any other clinical trials or preclinical studies, the results of which reasonably call into question the clinical trial or preclinical study results described or referred to in the Registration Statement and the Prospectus when viewed in the context in which such results are described; and the Company has not received any written notices or correspondence from the FDA, the EMA, or any other domestic or foreign governmental agency requiring the termination or suspension of any preclinical studies or clinical trials conducted by or on behalf of the Company that are described in the Registration Statement and the Prospectus or the results of which are referred to in the Registration Statement and the Prospectus.

tt. Compliance Program. The Company has taken such steps as the Company, believes are reasonable and appropriate to comply in all material respects with applicable regulatory guidelines (including, without limitation, those administered by the FDA, the EMA, and any other foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA or EMA); except where such noncompliance would not reasonably be expected to have a Material Adverse Effect.

uu. OFAC.

(i) The Company represents that, neither the Company nor any Subsidiary (collectively, the "Entity") or to the Company's knowledge any director, officer, employee, agent, affiliate or representative of the Entity, is a government, individual, or entity (in this paragraph (ss), "Person") that is, or is owned or controlled by a Person that is:

(a) the subject of any sanctions administered or enforced by the U.S. Department of Treasury's Office of Foreign Assets Control ("OFAC"), the United Nations Security Council ("UNSC"), the European Union ("EU"), Her Majesty's Treasury ("HMT"), or other relevant sanctions authority (collectively, "Sanctions"), nor

(b) located, organized or resident in a country or territory that is the subject of Sanctions.

(ii) The Company represents and covenants that it will not, directly or indirectly, knowingly use the proceeds of the offering, or knowingly lend, contribute or otherwise make available such proceeds to any Subsidiary, joint venture partner or other Person:

(a) to fund or facilitate any activities or business of or with any Person or in any country or territory that, at the time of such funding or facilitation, is the subject of Sanctions; or

(b) in any other manner that will result in a violation of Sanctions by any Person (including any Person participating in the offering, whether as underwriter, advisor, investor or otherwise).

(iii) The Company represents and covenants that, except as detailed in the Prospectus, for the past 5 years, it has not knowingly engaged in, is not now knowingly engaged in, and will not knowingly engage in, any dealings or transactions with any Person, or in any country or territory, that at the time of the dealing or transaction is or was the subject of Sanctions.

vv. Stock Transfer Taxes. On each Settlement Date, all stock transfer or other taxes (other than income taxes) which are required to be paid in connection with the sale and transfer of the Placement Shares to be sold hereunder will be, or will have been, fully paid or provided for by the Company and all laws imposing such taxes will be or will have been fully complied with by the Company.

Any certificate in the form of Exhibit 7(l) signed by an officer of the Company and delivered to the Agents or to counsel for the Agents pursuant to or in connection with this Agreement shall be deemed to be a representation and warranty by the Company, as applicable, to the Agents as to the matters set forth therein.

7. Covenants of the Company. The Company covenants and agrees with the Agents that:

a. Registration Statement Amendments. After the date of this Agreement and during any period in which a prospectus relating to any Placement Shares is required to be delivered by the Agents under the Securities Act (including in circumstances where such requirement may be satisfied pursuant to Rule 172 under the Securities Act) (the "Prospectus Delivery Period") (i) the Company will notify the Agents promptly of the time when any subsequent amendment to the Registration Statement, other than documents incorporated by reference or amendments not related to any Placement, has been filed with the Commission and/or has become effective or any subsequent supplement to the Prospectus, other than documents incorporated by reference, has been filed and of any request by the Commission for any amendment or supplement to the Registration Statement or Prospectus related to the Placement or for additional information related to the Placement, (ii) the Company will prepare and file with the Commission, promptly upon any Agent's request, any amendments or supplements to the Registration Statement or Prospectus that, in such Agent's reasonable opinion, may be necessary or advisable in connection with the distribution of the Placement Shares by the Agents (*provided, however*, that the failure of the Agents to make such request shall not relieve the Company of any obligation or liability hereunder, or affect the Agents' right to rely on the representations and warranties made by the Company in this Agreement and provided, further, that the only remedy the Agents shall have with respect to the failure to make such filing shall be to cease making sales under this Agreement until such amendment or supplement is filed); and (iii) the Company will cause each amendment or supplement to the Prospectus to be filed with the Commission as required pursuant to the applicable paragraph of Rule 424(b) of the Securities Act or, in the case of any document to be incorporated therein by reference, to be filed with the Commission as required pursuant to the Exchange Act, within the time period prescribed (the determination to file or not file any amendment or supplement with the Commission under this Section 7(a), based on the Company's reasonable opinion or reasonable objections, shall be made exclusively by the Company). Notwithstanding the foregoing, the Company will not file any amendment or supplement to the Registration Statement or Prospectus, other than documents incorporated by reference, relating to the Placement Shares or a security convertible into the Placement Shares unless a copy thereof has been submitted to the Agents within a reasonable period of time before the filing and the Agents have not reasonably and in good faith objected thereto (*provided, however*, that (A) the failure of the Agents to make such objection shall not relieve the Company of any obligation or liability hereunder, or affect the Agents' right to rely on the representations and warranties made by the Company in this Agreement and (B) the Company has no obligation to provide the Agents any advance copy of such filing or to provide the Agents an opportunity to object to such filing if the filing does not name the Agents or does not relate to the transaction herein provided; and provided, further, that the only remedy the Agents shall have with respect to the failure by the Company to obtain such consent shall be to cease making sales under this Agreement) and the Company will furnish to the Agents at the time of filing thereof a copy of any document that upon filing is deemed to be incorporated by reference into the Registration Statement or Prospectus, except for those documents available via EDGAR.

b. Notice of Commission Stop Orders. The Company will advise the Agents, promptly after it receives notice or obtains knowledge thereof, of the issuance or threatened issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement, of the suspension of the qualification of the Placement Shares for offering or sale in any jurisdiction, or of the initiation or threatening of any proceeding for any such purpose; and it will promptly use its commercially reasonable efforts to prevent the issuance of any stop order or to obtain its withdrawal if such a stop order should be issued. The Company will advise the Agents promptly after it receives any request by the Commission for any amendments to the Registration Statement or any amendment or supplements to the Prospectus or any Issuer Free Writing Prospectus or for additional information related to the offering of the Placement Shares or for additional information related to the Registration Statement, the Prospectus or any Issuer Free Writing Prospectus.

c . Delivery of Prospectus; Subsequent Changes. During the Prospectus Delivery Period, the Company will use its commercially reasonably efforts to comply in all material respects with all requirements imposed upon it by the Securities Act, as from time to time in force, and to file on or before their respective due dates all reports and any definitive proxy or information statements required to be filed by the Company with the Commission pursuant to Sections 13(a), 13(c), 14, 15(d) or any other provision of or under the Exchange Act. If the Company has omitted any information from the Registration Statement pursuant to Rule 430A under the Securities Act, it will use its commercially reasonable efforts to comply with the provisions of and make all requisite filings with the Commission pursuant to said Rule 430A and to notify the Agents promptly of all such filings. If during the Prospectus Delivery Period any event occurs as a result of which the Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in the light of the circumstances then existing, not misleading, or if during such Prospectus Delivery Period it is necessary to amend or supplement the Registration Statement or Prospectus to comply with the Securities Act, the Company will promptly notify the Designated Agent to suspend the offering of Placement Shares during such period and the Company will promptly amend or supplement the Registration Statement or Prospectus (at the expense of the Company) so as to correct such statement or omission or effect such compliance; *provided, however*, that the Company may delay the filing of any amendment or supplement, if in the judgment of the Company, it is in the best interest of the Company.

d . Listing of Placement Shares. During the Prospectus Delivery Period, the Company will use its commercially reasonable efforts to cause the Placement Shares to be listed on the Exchange and to qualify the Placement Shares for sale under the securities laws of such jurisdictions in the United States as the Agents reasonably designates and to continue such qualifications in effect so long as required for the distribution of the Placement Shares; *provided, however*, that the Company shall not be required in connection therewith to qualify as a foreign corporation or dealer in securities or file a general consent to service of process in any jurisdiction.

e. Delivery of Registration Statement and Prospectus. The Company will furnish to the Agents and their counsel (at the reasonable expense of the Company) copies of the Registration Statement, the Prospectus (including all documents incorporated by reference therein) and all amendments and supplements to the Registration Statement or Prospectus that are filed with the Commission during the Prospectus Delivery Period (including all documents filed with the Commission during such period that are deemed to be incorporated by reference therein), in each case as soon as reasonably practicable and in such quantities as the Agents may from time to time reasonably request and, at the Agents' request, will also furnish copies of the Prospectus to each exchange or market on which sales of the Placement Shares may be made; *provided, however*, that the Company shall not be required to furnish any document (other than the Prospectus) to the Agents to the extent such document is available on EDGAR.

f. Earnings Statement. The Company will make generally available to its shareholders as soon as practicable, but in any event not later than 15 months after the end of the Company's current fiscal year-end, an earnings statement covering a 12-month period that satisfies the provisions of Section 11(a) and Rule 158 of the Securities Act.

g. Use of Proceeds. The Company will use the Net Proceeds as described in the Prospectus in the section entitled "Use of Proceeds."

h. Notice of Other Sales. Without the prior written consent of the Agents, the Company will not, directly or indirectly, offer to sell, sell, contract to sell, grant any option to sell or otherwise dispose of any Common Stock (other than the Placement Shares offered pursuant to this Agreement) or securities convertible into or exchangeable for Common Stock, warrants or any rights to purchase or acquire, Common Stock during the period beginning on the date on which any Placement Notice is delivered to the Agents hereunder and ending on the third (3rd) Trading Day immediately following the final Settlement Date with respect to Placement Shares sold pursuant to such Placement Notice (or, if the Placement Notice has been terminated or suspended prior to the sale of all Placement Shares covered by a Placement Notice, the date of such suspension or termination); and will not directly or indirectly in any other "at the market" or continuous equity transaction offer to sell, sell, contract to sell, grant any option to sell or otherwise dispose of any Common Stock (other than the Placement Shares offered pursuant to this Agreement) or securities convertible into or exchangeable for Common Stock, warrants or any rights to purchase or acquire, Common Stock prior to the termination of this Agreement; *provided, however*, that such restrictions will not be required in connection with the Company's issuance or sale of (i) Common Stock, options to purchase Common Stock or Common Stock issuable upon the exercise of options or other equity awards, pursuant to any employee or director stock incentive or benefits plan or agreement, stock ownership plan or dividend reinvestment plan (but not Common Stock subject to a waiver to exceed plan limits in its dividend reinvestment plan) of the Company whether now in effect or hereafter implemented; (ii) Common Stock issuable upon conversion of securities or the exercise of warrants, options or other rights in effect or outstanding, and disclosed in filings by the Company available on EDGAR or otherwise in writing to the Agents, and (iii) Common Stock, or securities convertible into or exercisable for Common Stock, offered and sold in a privately negotiated transaction to vendors, customers, strategic partners or potential strategic partners or other investors conducted in a manner so as not to be integrated with the offering of Common Stock hereby.

i. Change of Circumstances. The Company will, at any time during the pendency of a Placement Notice advise the Agents promptly after it shall have received notice or obtained knowledge thereof, of any information or fact that would alter or affect in any material respect any opinion, certificate, letter or other document required to be provided to the Agents pursuant to this Agreement.

j. Due Diligence Cooperation. During the term of this Agreement, the Company will cooperate with any reasonable due diligence review conducted by the Agents or their representatives in connection with the transactions contemplated hereby, including, without limitation, providing information and making available documents and senior corporate officers, during regular business hours and at the Company's principal offices, as the Agents may reasonably request.

k. Required Filings Relating to Placement of Placement Shares. The Company agrees that on such dates as the Securities Act shall require, the Company will (i) file a prospectus supplement with the Commission under the applicable paragraph of Rule 424(b) under the Securities Act (each and every filing under Rule 424(b), a "Filing Date"), which prospectus supplement will set forth, within the relevant period, the amount of Placement Shares sold through the Agents, the Net Proceeds to the Company and the compensation payable by the Company to the Agents with respect to such Placement Shares or, if any such prospectus supplement is not filed pursuant to Rule 424(b), otherwise include such information in the Company's Exchange Act filings on such date as shall be required, and (ii) deliver such number of copies of each such prospectus supplement to each exchange or market on which such sales were effected as may be required by the rules or regulations of such exchange or market.

l. Representation Dates; Certificate. Each time during the term of this Agreement that the Company:

(i) amends or supplements (other than a prospectus supplement relating solely to an offering of securities other than the Placement Shares) the Registration Statement or the Prospectus relating to the Placement Shares by means of a post-effective amendment, sticker, or supplement but not by means of incorporation of documents by reference into the Registration Statement or the Prospectus relating to the Placement Shares;

(ii) files an annual report on Form 10-K under the Exchange Act (including any Form 10-K/A containing amended financial information or a material amendment to the previously filed Form 10-K);

(iii) files its quarterly reports on Form 10-Q under the Exchange Act; or

(iv) files a current report on Form 8-K containing amended financial information (other than information "furnished" pursuant to Items 2.02 or 7.01 of Form 8-K or to provide disclosure pursuant to Item 8.01 of Form 8-K relating to the reclassification of certain properties as discontinued operations in accordance with Statement of Financial Accounting Standards No. 144) under the Exchange Act;

(Each date of filing of one or more of the documents referred to in clauses (i) through (iv) shall be a "Representation Date.")

the Company shall furnish the Agents (but in the case of clause (iv) above only if any Agent reasonably determines that the information contained in such Form 8-K is material) with a certificate, in the form attached hereto as Exhibit 7(1). The requirement to provide a certificate under this Section 7(1) shall be waived for any Representation Date occurring at a time at which no Placement Notice is pending, which waiver shall continue until the earlier to occur of the date the Company delivers a Placement Notice hereunder (which for such calendar quarter shall be considered a Representation Date) and the next occurring Representation Date on which the Company files its annual report on Form 10-K. Notwithstanding the foregoing, (i) upon the delivery of the first Placement Notice hereunder and (ii) if the Company subsequently decides to sell Placement Shares following a Representation Date when the Company relied on such waiver and did not provide the Agents with a certificate under this Section 7(1), then before the Agents sell any Placement Shares, the Company shall provide the Agents with a certificate, in the form attached hereto as Exhibit 7(1), dated the date of the Placement Notice.

m. Legal Opinion. On or prior to the date of the first Placement Notice given hereunder the Company shall cause to be furnished to the Agents written opinions and a negative assurance letter of The Matt Law Firm, PLLC ("Company Counsel"), or other counsel reasonably satisfactory to the Agents, in the form attached hereto as Exhibit 7(m)(1) and 7(m)(2), respectively. Thereafter, within five (5) Trading Days of each Representation Date with respect to which the Company is obligated to deliver a certificate in the form attached hereto as Exhibit 7(l) for which no waiver is applicable, the Company shall cause to be furnished to the Agents a written letter of Company Counsel in the form attached hereto as Exhibit 7(m)(2), modified, as necessary, to relate to the Registration Statement and the Prospectus as then amended or supplemented; *provided that,* in lieu of such negative assurance for subsequent periodic filings under the Exchange Act, counsel may furnish the Agents with a letter (a "Reliance Letter") to the effect that the Agents may rely on the negative assurance letter previously delivered under this Section 7(m) to the same extent as if it were dated the date of such letter (except that statements in such prior letter shall be deemed to relate to the Registration Statement and the Prospectus as amended or supplemented as of the date of the Reliance Letter).

n. Comfort Letter. On or prior to the date of the first Placement Notice given hereunder and within five (5) Trading Days after each subsequent Representation Date, other than pursuant to Section 7(l)(iii), the Company shall cause its independent accountants to furnish the Agents letters (the "Comfort Letters"), dated the date the Comfort Letter is delivered, which shall meet the requirements set forth in this Section 7(n); provided, that if requested by an Agent, the Company shall cause a Comfort Letter to be furnished to the Agents within ten (10) Trading Days of such request following the date of occurrence of any restatement of the Company's financial statements. The Comfort Letter from the Company's independent accountants shall be in a form and substance reasonably satisfactory to the Agents, (i) confirming that they are an independent public accounting firm within the meaning of the Securities Act and the PCAOB, (ii) stating, as of such date, the conclusions and findings of such firm with respect to the financial information and other matters ordinarily covered by accountants' "comfort letters" to underwriters in connection with registered public offerings (the first such letter, the "Initial Comfort Letter") and (iii) updating the Initial Comfort Letter with any information that would have been included in the Initial Comfort Letter had it been given on such date and modified as necessary to relate to the Registration Statement and the Prospectus, as amended and supplemented to the date of such letter.

o. Market Activities. The Company will not, directly or indirectly, (i) take any action designed to cause or result in, or that constitutes or would reasonably be expected to constitute, the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of Placement Shares or (ii) sell, bid for, or purchase Common Stock in violation of Regulation M, or pay anyone any compensation for soliciting purchases of the Placement Shares other than the Agents.

p. Investment Company Act. The Company will conduct its affairs in such a manner so as to reasonably ensure that neither it nor the Subsidiaries will be or become, at any time prior to the termination of this Agreement, an "investment company," as such term is defined in the Investment Company Act.

q. No Offer to Sell. Other than an Issuer Free Writing Prospectus approved in advance by the Company and the Agents in their capacity as agents hereunder pursuant to Section 23, neither the Agents nor the Company (including its agents and representatives, other than the Agents in their capacity as such) will make, use, prepare, authorize, approve or refer to any written communication (as defined in Rule 405), required to be filed with the Commission, that constitutes an offer to sell or solicitation of an offer to buy Placement Shares hereunder.

r. Sarbanes-Oxley Act. The Company will maintain and keep accurate books and records reflecting its assets and maintain internal accounting controls in a manner designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP and including those policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company, (ii) provide reasonable assurance that transactions are recorded as necessary to permit the preparation of the Company's consolidated financial statements in accordance with GAAP, (iii) that receipts and expenditures of the Company are being made only in accordance with management's and the Company's directors' authorization, and (iv) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on its financial statements. The Company will maintain such controls and other procedures, including, without limitation, those required by Sections 302 and 906 of the Sarbanes-Oxley Act, and the applicable regulations thereunder that are designed to ensure that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Commission's rules and forms, including, without limitation, controls and procedures designed to ensure that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the Company's management, including its principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure and to ensure that material information relating to the Company or the Subsidiaries is made known to them by others within those entities, particularly during the period in which such periodic reports are being prepared.

8. Representations and Covenants of the Agents. Each of the Agents represents and warrants that it is duly registered as a broker-dealer under FINRA, the Exchange Act and the applicable statutes and regulations of each state in which the Placement Shares will be offered and sold, except such states in which such Agent is exempt from registration or such registration is not otherwise required. Each of the Agents shall continue, for the term of this Agreement, to be duly registered as a broker-dealer under FINRA, the Exchange Act and the applicable statutes and regulations of each state in which the Placement Shares will be offered and sold, except such states in which such Agent is exempt from registration or such registration is not otherwise required, during the term of this Agreement. Each of the Agents shall comply with all applicable law and regulations in connection with the transactions contemplated by this Agreement, including the issuance and sale through the Agents of the Placement Shares.

9. Payment of Expenses. The Company will pay all expenses incident to the performance of its obligations under this Agreement, including (i) the preparation, filing, including any fees required by the Commission, and printing of the Registration Statement (including financial statements and exhibits) as originally filed and of each amendment and supplement thereto and each Free Writing Prospectus, in such number as the Agents shall deem reasonably necessary, (ii) the printing and delivery to the Agents of this Agreement and such other documents as may be reasonably required in connection with the offering, purchase, sale, issuance or delivery of the Placement Shares, (iii) the preparation, issuance and delivery of the certificates, if any, for the Placement Shares to the Agents, including any stock or other transfer taxes and any capital duties, stamp duties or other duties or taxes payable upon the sale, issuance or delivery of the Placement Shares to the Agents, (iv) the fees and disbursements of the counsel, accountants and other advisors to the Company, (v) the reasonable fees and disbursements of counsel to the Agents up to a maximum of $15,000; (vi) the fees and expenses of the transfer agent and registrar for the Common Stock, (vii) the filing fees incident to any review by FINRA of the terms of the sale of the Placement Shares, and (viii) the fees and expenses incurred in connection with the listing of the Placement Shares on the Exchange.

10. Conditions to the Agents' Obligations. The obligations of the Agents hereunder with respect to a Placement will be subject to the continuing accuracy and completeness of the representations and warranties made by the Company herein, to the due performance by the Company of its obligations hereunder, to the completion by the Agents of a due diligence review satisfactory to it in its reasonable judgment, and to the continuing satisfaction (or waiver by the Agents in their sole discretion) of the following additional conditions:

a. Registration Statement Effective. The Registration Statement shall have become effective and shall be available for the sale of all Placement Shares contemplated to be issued by any Placement Notice.

b. No Material Notices. None of the following events shall have occurred and be continuing: (i) receipt by the Company of any request for additional information from the Commission or any other federal or state governmental authority during the period of effectiveness of the Registration Statement, the response to which would require any post-effective amendments or supplements to the Registration Statement or the Prospectus which have not, as of the time of such Placement, been so made; (ii) the issuance by the Commission or any other federal or state governmental authority of any stop order suspending the effectiveness of the Registration Statement or the initiation of any proceedings for that purpose; (iii) receipt by the Company of any notification with respect to the suspension of the qualification or exemption from qualification of any of the Placement Shares for sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose; or (iv) the occurrence of any event that requires the making of any changes in the Registration Statement or the Prospectus so that, in the case of the Registration Statement, it will not contain any materially untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading and, that in the case of the Prospectus, it will not contain any materially untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading, which changes shall not, as of the time of such Placement, have so been made.

c . No Misstatement or Material Omission. The Agents shall not have advised the Company that the Registration Statement or Prospectus, or any amendment or supplement thereto, contains an untrue statement of fact that in the Agents' reasonable opinion is material, or omits to state a fact that in the Agents' reasonable opinion is material and is required to be stated therein or is necessary to make the statements therein not misleading.

d. Material Changes. Except as contemplated in the Prospectus, or disclosed in the Company's reports filed with the Commission, there shall not have been any Material Adverse Effect, or any development that could reasonably be expected to cause a Material Adverse Effect in each case is so material as to make it impracticable or inadvisable to proceed with the offering of the Placement Shares on the terms and in the manner contemplated in the Prospectus.

e. Legal Opinion. The Agents shall have received the opinions and negative assurances of Company Counsel required to be delivered pursuant Section 7(m) on or before the date on which such delivery of such opinions are required pursuant to Section 7(m).

f. Comfort Letter. The Agents shall have received the Comfort Letter required to be delivered pursuant Section 7(n) on or before the date on which such delivery of such letter is required pursuant to Section 7(n).

g. Representation Certificate. The Agents shall have received the certificate required to be delivered pursuant to Section 7(1) on or before the date on which delivery of such certificate is required pursuant to Section 7(1).

h. Secretary's Certificate. On or prior to the first Representation Date, the Agents shall have received a certificate, signed on behalf of the Company by its corporate Secretary, in form and substance reasonably satisfactory to the Agents and their counsel.

i. No Suspension. Trading in the Common Stock shall not have been suspended on the Exchange and the Common Stock shall not have been delisted from the Exchange.

j. Other Materials. On each date on which the Company is required to deliver a certificate pursuant to Section 7(l), the Company shall have furnished to the Agents such appropriate further information, certificates and documents as the Agents may reasonably request. All such opinions, certificates, letters and other documents will be in compliance with the provisions hereof. The Company will furnish the Agents with such conformed copies of such opinions, certificates, letters and other documents as the Agents shall reasonably request.

k. Securities Act Filings Made. All filings with the Commission required by Rule 424 under the Securities Act to have been filed prior to the issuance of any Placement Notice hereunder shall have been made within the applicable time period prescribed for such filing by Rule 424.

l. Approval for Listing. The Placement Shares shall either have been approved for listing on the Exchange, subject only to notice of issuance, or the Company shall have filed an application for listing of the Placement Shares on the Exchange at, or prior to, the issuance of any Placement Notice.

m. No Termination Event. There shall not have occurred any event that would permit the Agents to terminate this Agreement pursuant to Section 13(a).

11. Indemnification and Contribution.

(a) Company Indemnification. The Company agrees to indemnify and hold harmless the Agents, their partners, members, directors, officers, employees and agents and each person, if any, who controls the Agents within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act as follows:

(i) against any and all loss, liability, claim, damage and expense whatsoever, as incurred, joint or several, arising out of or based upon any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement (or any amendment thereto), or the omission or alleged omission therefrom of a material fact required to be stated therein or necessary to make the statements therein not misleading, or arising out of any untrue statement or alleged untrue statement of a material fact included in any related Issuer Free Writing Prospectus or the Prospectus (or any amendment or supplement thereto), or the omission or alleged omission therefrom of a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading;

(ii) against any and all loss, liability, claim, damage and expense whatsoever, as incurred, joint or several, to the extent of the aggregate amount paid in settlement of any litigation, or any investigation or proceeding by any governmental agency or body, commenced or threatened, or of any claim whatsoever based upon any such untrue statement or omission, or any such alleged untrue statement or omission; provided that (subject to Section 11(d) below) any such settlement is effected with the written consent of the Company, which consent shall not unreasonably be delayed or withheld; and

(iii) against any and all expense whatsoever, as incurred (including the reasonable documented fees and disbursements of counsel), reasonably incurred in investigating, preparing or defending against any litigation, or any investigation or proceeding by any governmental agency or body, commenced or threatened, or any claim whatsoever based upon any such untrue statement or omission, or any such alleged untrue statement or omission, to the extent that any such expense is not paid under (i) or (ii) above,

provided, however, that this indemnity agreement shall not apply to any loss, liability, claim, damage or expense to the extent arising out of any untrue statement or omission or alleged untrue statement or omission made solely in reliance upon and in conformity with written information furnished to the Company by an Agent expressly for use in the Registration Statement (or any amendment thereto), or in any related Issuer Free Writing Prospectus or the Prospectus (or any amendment thereto).

(b) Agent Indemnification. Each Agent agrees to indemnify and hold harmless the Company and its directors and each officer of the Company who signed the Registration Statement, and each person, if any, who (i) controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act or (ii) is controlled by or is under common control with the Company against any and all loss, liability, claim, damage and expense described in the indemnity contained in Section 11(a), as incurred, but only with respect to untrue statements or omissions, or alleged untrue statements or omissions, made in the Registration Statement (or any amendments thereto) or in any related Issuer Free Writing Prospectus or the Prospectus (or any amendment or supplement thereto) in reliance upon and in conformity with information relating to such Agent and furnished to the Company in writing by such Agent expressly for use therein.

(c) Procedure. Any party that proposes to assert the right to be indemnified under this Section 11 will, promptly after receipt of notice of commencement of any action against such party in respect of which a claim is to be made against an indemnifying party or parties under this Section 11, notify each such indemnifying party of the commencement of such action, enclosing a copy of all papers served, but the omission so to notify such indemnifying party will not relieve the indemnifying party from (i) any liability that it might have to any indemnified party otherwise than under this Section 11 and (ii) any liability that it may have to any indemnified party under the foregoing provision of this Section 11 unless, and only to the extent that, such omission results in the forfeiture of substantive rights or defenses by the indemnifying party. If any such action is brought against any indemnified party and it notifies the indemnifying party of its commencement, the indemnifying party will be entitled to participate in and, to the extent that it elects by delivering written notice to the indemnified party promptly after receiving notice of the commencement of the action from the indemnified party, jointly with any other indemnifying party similarly notified, to assume the defense of the action, with counsel reasonably satisfactory to the indemnified party, and after notice from the indemnifying party to the indemnified party of its election to assume the defense, the indemnifying party will not be liable to the indemnified party for any legal or other expenses except as provided below and except for the reasonable costs of investigation subsequently incurred by the indemnified party in connection with the defense. The indemnified party will have the right to employ its own counsel in any such action, but the fees, expenses and other charges of such counsel will be at the expense of such indemnified party unless (1) the employment of counsel by the indemnified party has been authorized in writing by the indemnifying party, (2) the indemnified party has reasonably concluded (based on advice of counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available to the indemnifying party, (3) a conflict or potential conflict exists (based on advice of counsel to the indemnified party) between the indemnified party and the indemnifying party (in which case the indemnifying party will not have the right to direct the defense of such action on behalf of the indemnified party) or (4) the indemnifying party has not in fact employed counsel to assume the defense of such action within a reasonable time after receiving notice of the commencement of the action, in each of which cases the reasonable fees, disbursements and other charges of counsel will be at the expense of the indemnifying party or parties. It is understood that the indemnifying party or parties shall not, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements and other charges of more than one separate firm admitted to practice in such jurisdiction at any one time for all such indemnified party or parties. All such fees, disbursements and other charges will be reimbursed by the indemnifying party promptly after the indemnifying party receives a written invoice relating to fees, disbursements and other charges in reasonable detail. An indemnifying party will not, in any event, be liable for any settlement of any action or claim effected without its written consent. No indemnifying party shall, without the prior written consent of each indemnified party, settle or compromise or consent to the entry of any judgment in any pending or threatened claim, action or proceeding relating to the matters contemplated by this Section 11 (whether or not any indemnified party is a party thereto), unless such settlement, compromise or consent (1) includes an unconditional release of each indemnified party from all liability arising out of such litigation, investigation, proceeding or claim and (2) does not include a statement as to or an admission of fault, culpability or a failure to act by or on behalf of any indemnified party.

(d) Contribution. In order to provide for just and equitable contribution in circumstances in which the indemnification provided for in the foregoing paragraphs of this Section 11 is applicable in accordance with its terms but for any reason is held to be unavailable from the Company or an Agent, the Company and such Agent will contribute to the total losses, claims, liabilities, expenses and damages (including any investigative, legal and other expenses reasonably incurred in connection with, and any amount paid in settlement of, any action, suit or proceeding or any claim asserted, but after deducting any contribution received by the Company from persons other than the Agents, such as persons who control the Company within the meaning of the Securities Act or the Exchange Act, officers of the Company who signed the Registration Statement and directors of the Company, who also may be liable for contribution) to which the Company and the Agents may be subject in such proportion as shall be appropriate to reflect the relative benefits received by the Company on the one hand and the Agents on the other hand. The relative benefits received by the Company on the one hand and the Agents on the other hand shall be deemed to be in the same proportion as the total Net Proceeds from the sale of the Placement Shares (before deducting expenses) received by the Company bear to the total compensation received by the Agents (before deducting expenses) from the sale of Placement Shares on behalf of the Company. If, but only if, the allocation provided by the foregoing sentence is not permitted by applicable law, the allocation of contribution shall be made in such proportion as is appropriate to reflect not only the relative benefits referred to in the foregoing sentence but also the relative fault of the Company, on the one hand, and such Agent, on the other hand, with respect to the statements or omission that resulted in such loss, claim, liability, expense or damage, or action in respect thereof, as well as any other relevant equitable considerations with respect to such offering. Such relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact relates to information supplied by the Company or such Agent, the intent of the parties and their relative knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and each Agent agree that it would not be just and equitable if contributions pursuant to this Section 11(d) were to be determined by pro rata allocation or by any other method of allocation that does not take into account the equitable considerations referred to herein. The amount paid or payable by an indemnified party as a result of the loss, claim, liability, expense, or damage, or action in respect thereof, referred to above in this Section 11(d) shall be deemed to include, for the purpose of this Section 11(d), any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim to the extent consistent with Section 11(c) hereof. Notwithstanding the foregoing provisions of this Section 11(d), and except in the case of gross negligence or willful misconduct, an Agent shall not be required to contribute any amount in excess of the commissions received by it under this Agreement and no person found guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 11(d), any person who controls a party to this Agreement within the meaning of the Securities Act or the Exchange Act, and any officers, directors, partners, employees or agents of an Agent, will have the same rights to contribution as that party, and each officer and director of the Company who signed the Registration Statement will have the same rights to contribution as the Company, subject in each case to the provisions hereof. Any party entitled to contribution, promptly after receipt of notice of commencement of any action against such party in respect of which a claim for contribution may be made under this Section 11(d), will notify any such party or parties from whom contribution may be sought, but the omission to so notify will not relieve that party or parties from whom contribution may be sought from any other obligation it or they may have under this Section 11(d) except to the extent that the failure to so notify such other party materially prejudiced the substantive rights or defenses of the party from whom contribution is sought. Except for a settlement entered into pursuant to the last sentence of Section 11(c) hereof, no party will be liable for contribution with respect to any action or claim settled without its written consent if such consent is required pursuant to Section 11(c) hereof.

12. Representations and Agreements to Survive Delivery. The indemnity and contribution agreements contained in Section 11 of this Agreement and all representations and warranties of the Company and the Agents herein or in certificates delivered pursuant hereto shall survive, as of their respective dates, regardless of (i) any investigation made by or on behalf of the Agents, any controlling persons, or the Company (or any of their respective officers, directors or controlling persons), (ii) delivery and acceptance of the Placement Shares and payment therefor or (iii) any termination of this Agreement.

13. Termination.

a. An Agent may terminate this Agreement, written by notice to the Company, as hereinafter specified at any time (1) if there has been, since the time of execution of this Agreement or since the date as of which information is given in the Prospectus, any Material Adverse Effect, or any development that is reasonably likely to have a Material Adverse Effect or, in the reasonable judgment of such Agent, is material and adverse and makes it impractical or inadvisable to market the Placement Shares or to enforce contracts for the sale of the Placement Shares, (2) if there has occurred any material adverse change in the financial markets in the United States or the international financial markets, any outbreak of hostilities or escalation thereof or other calamity or crisis or any change or development involving a prospective change in national or international political, financial or economic conditions, in each case the effect of which is such as to make it, in the reasonable and good faith judgment of such Agent, impracticable or inadvisable to market the Placement Shares or to enforce contracts for the sale of the Placement Shares, (3) if trading in the Common Stock has been suspended or limited by the Commission or the Exchange, or if trading generally on the Exchange has been suspended or limited, or minimum prices for trading have been fixed on the Exchange, (4) if any suspension of trading of any securities of the Company on any exchange or in the over-the-counter market shall have occurred and be continuing for a period of at least 10 days, (5) if a major disruption of securities settlements or clearance services in the United States shall have occurred and be continuing, or (6) if a banking moratorium has been declared by either U.S. Federal or New York authorities. Any such termination shall be without liability of any party to any other party except that the provisions of Section 9 (Payment of Expenses), Section 11 (Indemnification and Contribution), Section 12 (Representations and Agreements to Survive Delivery), Section 18 (Governing Law and Time; Waiver of Jury Trial) and Section 19 (Consent to Jurisdiction) hereof shall remain in full force and effect notwithstanding such termination. If an Agent elects to terminate this Agreement as provided in this Section 13(a), such Agent shall provide the required notice as specified in Section 14 (Notices).

b. The Company shall have the right, by giving ten (10) days notice as hereinafter specified to terminate this Agreement in its sole discretion (for any reason or no reason) at any time after the date of this Agreement. Any such termination shall be without liability of any party to any other party except that the provisions of Section 9 (Payment of Expenses), Section 11 (Indemnification and Contribution), Section 12 (Representations and Agreements to Survive Delivery), Section 18 (Governing Law and Time; Waiver of Jury Trial) and Section 19 (Consent to Jurisdiction) hereof shall remain in full force and effect notwithstanding such termination.

c. Each Agent shall have the right, by giving ten (10) days notice as hereinafter specified to terminate this Agreement in its sole discretion (for any reason or no reason) at any time after the date of this Agreement. Any such termination shall be without liability of any party to any other party except that the provisions of Section 9 (Payment of Expenses), Section 11 (Indemnification and Contribution), Section 12 (Representations and Agreements to Survive Delivery), Section 18 (Governing Law and Time; Waiver of Jury Trial) and Section 19 (Consent to Jurisdiction) hereof shall remain in full force and effect notwithstanding such termination.

d. Unless earlier terminated pursuant to this Section 13, this Agreement shall automatically terminate upon the issuance and sale of all of the Placement Shares through the Agents on the terms and subject to the conditions set forth herein except that the provisions of Section 9 (Payment of Expenses), Section 11 (Indemnification and Contribution), Section 12 (Representations and Agreements to Survive Delivery), Section 18 (Governing Law and Time; Waiver of Jury Trial) and Section 19 (Consent to Jurisdiction) hereof shall remain in full force and effect notwithstanding such termination.

e. This Agreement shall remain in full force and effect unless terminated pursuant to Sections 13(a), (b), (c), or (d) above or otherwise by mutual agreement of the parties; *provided, however*, that any such termination by mutual agreement shall in all cases be deemed to provide that Section 9 (Payment of Expenses), Section 11 (Indemnification and Contribution), Section 12 (Representations and Agreements to Survive Delivery), Section 18 (Governing Law and Time; Waiver of Jury Trial) and Section 19 (Consent to Jurisdiction) shall remain in full force and effect. Upon termination of this Agreement, the Company shall not have any liability to an Agent for any discount, commission or other compensation with respect to any Placement Shares not otherwise sold by an Agent under this Agreement.

f. Any termination of this Agreement shall be effective on the date specified in such notice of termination; *provided, however*, that such termination shall not be effective until the close of business on the date of receipt of such notice by an Agent or the Company, as the case may be. If such termination shall occur prior to the Settlement Date for any sale of Placement Shares, such Placement Shares shall settle in accordance with the provisions of this Agreement.

14. Notices. All notices or other communications required or permitted to be given by any party to any other party pursuant to the terms of this Agreement shall be in writing, unless otherwise specified, and if sent to the Agents, shall be delivered to:

FBR Capital Markets & Co.
1300 North 17th Street Suite 1400
Arlington, Virginia 22209
Attention: Legal Department
Telephone: (703) 312-9500
Email: atmdesk@fbr.com

MLV & Co. LLC
299 Park Avenue, 7th Floor
New York, New York 10171
Attention: Legal Department
Telephone: (212) 542-5880
Email: mlvlegal@mlvco.com

JonesTrading Institutional Services LLC
32133 Lindero Canyon Road
Suite 208
Westlake Village, CA 91361
Fax No.: (818) 879-5481
Attn: Trent McNair
Email: trentm@jonestrading.com

With a copy to:

265 Franklin Street
18th Floor,
Boston, MA 02110
Attn: Steve Chmielewski, Esq.
Facsimile: (781) 416-2899
E-mail: steve@jonestrading.com

with a copy to:

Duane Morris LLP
One Riverfront Plaza
1037 Raymond Boulevard, Suite 1800
Newark, New Jersey 07102-5429
Attention: James T. Seery
Telephone: (973) 424-2088
Email: jtseery@duanemorris.com

and if to the Company, shall be delivered to:

Actinium Pharmaceuticals, Inc.
275 Madison Avenue, 7th Floor
New York, NY 10016
Attention: Chief Executive Officer
Telephone: (646) 677-3870
Email: sseth@actiniumpharma.com

with a copy to:

The Matt Law Firm, PLLC
1701 Genesee Street
Utica, New York 13501
Attention: Thomas Slusarczyk, Esq.
Telephone: (315) 235-2299
Email: tslusarczyk@mattlawfirm.com

Each party to this Agreement may change such address for notices by sending to the parties to this Agreement written notice of a new address for such purpose. Each such notice or other communication shall be deemed given (i) when delivered personally, by email, or by verifiable facsimile transmission (with an original to follow) on or before 4:30 p.m., New York City time, on a Business Day or, if such day is not a Business Day, on the next succeeding Business Day, (ii) on the next Business Day after timely delivery to a nationally-recognized overnight courier and (iii) on the Business Day actually received if deposited in the U.S. mail (certified or registered mail, return receipt requested, postage prepaid). For purposes of this Agreement, "Business Day" shall mean any day on which the Exchange and commercial banks in the City of New York are open for business.

An electronic communication ("Electronic Notice") shall be deemed written notice for purposes of this Section 14 if sent to the electronic mail address specified by the receiving party under separate cover. Electronic Notice shall be deemed received at the time the party sending Electronic Notice receives confirmation of receipt by the receiving party. Any party receiving Electronic Notice may request and shall be entitled to receive the notice on paper, in a nonelectronic form ("Nonelectronic Notice") which shall be sent to the requesting party within ten (10) days of receipt of the written request for Nonelectronic Notice.

15. Successors and Assigns. This Agreement shall inure to the benefit of and be binding upon the Company and each Agent and their respective successors and the affiliates, controlling persons, officers and directors referred to in Section 11 hereof. References to any of the parties contained in this Agreement shall be deemed to include the successors and permitted assigns of such party. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and permitted assigns any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided in this Agreement. Neither party may assign its rights or obligations under this Agreement without the prior written consent of the other party.

16. Adjustments for Stock Splits. The parties acknowledge and agree that all share-related numbers contained in this Agreement shall be adjusted to take into account any share consolidation, stock split, stock dividend, corporate domestication or similar event effected with respect to the Placement Shares.

17. Entire Agreement; Amendment; Severability. This Agreement (including all schedules and exhibits attached hereto and Placement Notices issued pursuant hereto) constitutes the entire agreement and supersedes all other prior and contemporaneous agreements and undertakings, both written and oral, among the parties hereto with regard to the subject matter hereof. Neither this Agreement nor any term hereof may be amended except pursuant to a written instrument executed by the Company and the Agents. In the event that any one or more of the provisions contained herein, or the application thereof in any circumstance, is held invalid, illegal or unenforceable as written by a court of competent jurisdiction, then such provision shall be given full force and effect to the fullest possible extent that it is valid, legal and enforceable, and the remainder of the terms and provisions herein shall be construed as if such invalid, illegal or unenforceable term or provision was not contained herein, but only to the extent that giving effect to such provision and the remainder of the terms and provisions hereof shall be in accordance with the intent of the parties as reflected in this Agreement.

18. GOVERNING LAW AND TIME; WAIVER OF JURY TRIAL. THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO THE PRINCIPLES OF CONFLICTS OF LAWS. SPECIFIED TIMES OF DAY REFER TO NEW YORK CITY TIME. EACH PARTY HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY.

19. CONSENT TO JURISDICTION. EACH PARTY HEREBY IRREVOCABLY SUBMITS TO THE NON-EXCLUSIVE JURISDICTION OF THE STATE AND FEDERAL COURTS SITTING IN THE CITY OF NEW YORK, BOROUGH OF MANHATTAN, FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH ANY TRANSACTION CONTEMPLATED HEREBY, AND HEREBY IRREVOCABLY WAIVES, AND AGREES NOT TO ASSERT IN ANY SUIT, ACTION OR PROCEEDING, ANY CLAIM THAT IT IS NOT PERSONALLY SUBJECT TO THE JURISDICTION OF ANY SUCH COURT, THAT SUCH SUIT, ACTION OR PROCEEDING IS BROUGHT IN AN INCONVENIENT FORUM OR THAT THE VENUE OF SUCH SUIT, ACTION OR PROCEEDING IS IMPROPER. EACH PARTY HEREBY IRREVOCABLY WAIVES PERSONAL SERVICE OF PROCESS AND CONSENTS TO PROCESS BEING SERVED IN ANY SUCH SUIT, ACTION OR PROCEEDING BY MAILING A COPY THEREOF (CERTIFIED OR REGISTERED MAIL, RETURN RECEIPT REQUESTED) TO SUCH PARTY AT THE ADDRESS IN EFFECT FOR NOTICES TO IT UNDER THIS AGREEMENT AND AGREES THAT SUCH SERVICE SHALL CONSTITUTE GOOD AND SUFFICIENT SERVICE OF PROCESS AND NOTICE THEREOF. NOTHING CONTAINED HEREIN SHALL BE DEEMED TO LIMIT IN ANY WAY ANY RIGHT TO SERVE PROCESS IN ANY MANNER PERMITTED BY LAW.

20. Use of Information. The Agents may not use any information gained in connection with this Agreement and the transactions contemplated by this Agreement, including due diligence, to advise any party with respect to transactions not expressly approved by the Company.

21. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Delivery of an executed Agreement by one party to the other may be made by facsimile transmission.

22. Effect of Headings. The section and Exhibit headings herein are for convenience only and shall not affect the construction hereof.

23. Permitted Free Writing Prospectuses.

The Company represents, warrants and agrees that, unless it obtains the prior consent of each Agent, which consent shall not be unreasonably withheld, conditioned or delayed, and each Agent represents, warrants and agrees that, unless it obtains the prior consent of the Company, which consent shall not be unreasonably withheld, conditioned or delayed, it has not made and will not make any offer relating to the Placement Shares that would constitute an Issuer Free Writing Prospectus, or that would otherwise constitute a "free writing prospectus," as defined in Rule 405, required to be filed with the Commission. Any such free writing prospectus consented to by the Agents or by the Company, as the case may be, is hereinafter referred to as a "Permitted Free Writing Prospectus." The Company represents and warrants that it has treated and agrees that it will treat each Permitted Free Writing Prospectus as an "issuer free writing prospectus," as defined in Rule 433, and has complied and will comply with the requirements of Rule 433 applicable to any Permitted Free Writing Prospectus, including timely filing with the Commission where required, legending and record keeping. For the purposes of clarity, the parties hereto agree that all free writing prospectuses, if any, listed in Exhibit 23 hereto are Permitted Free Writing Prospectuses.

24. Absence of Fiduciary Relationship. The Company acknowledges and agrees that:

a. Each Agent is acting solely as agent in connection with the public offering of the Placement Shares and in connection with each transaction contemplated by this Agreement and the process leading to such transactions, and no fiduciary or advisory relationship between the Company or any of its respective affiliates, stockholders (or other equity holders), creditors or employees or any other party, on the one hand, and the Agents, on the other hand, has been or will be created in respect of any of the transactions contemplated by this Agreement, irrespective of whether or not any Agent has advised or is advising the Company on other matters, and the Agents have no obligation to the Company with respect to the transactions contemplated by this Agreement except the obligations expressly set forth in this Agreement;

b. it is capable of evaluating and understanding, and understands and accepts, the terms, risks and conditions of the transactions contemplated by this Agreement;

c. the Agents have not provided any legal, accounting, regulatory or tax advice with respect to the transactions contemplated by this Agreement and it has consulted its own legal, accounting, regulatory and tax advisors to the extent it has deemed appropriate;

d. it is aware that the Agents and their affiliates are engaged in a broad range of transactions which may involve interests that differ from those of the Company and such Agent has no obligation to disclose such interests and transactions to the Company by virtue of any fiduciary, advisory or agency relationship or otherwise; and

e. it waives, to the fullest extent permitted by law, any claims it may have against the Agents for breach of fiduciary duty or alleged breach of fiduciary duty in connection with the sale of Placement Shares under this Agreement and agrees that the Agents shall not have any liability (whether direct or indirect, in contract, tort or otherwise) to it in respect of such a fiduciary duty claim or to any person asserting a fiduciary duty claim on its behalf or in right of it or the Company, employees or creditors of Company, other than in respect of the Agents' obligations under this Agreement and to keep information provided by the Company to the Agents and the Agents' counsel confidential to the extent not otherwise publicly-available.

25. Definitions.

As used in this Agreement, the following terms have the respective meanings set forth below:

"Applicable Time" means (i) each Representation Date and (ii) the time of each sale of any Placement Shares pursuant to this Agreement.

"Issuer Free Writing Prospectus" means any "issuer free writing prospectus," as defined in Rule 433, relating to the Placement Shares that (1) is required to be filed with the Commission by the Company, (2) is a "road show" that is a "written communication" within the meaning of Rule 433(d)(8)(i) whether or not required to be filed with the Commission, or (3) is exempt from filing pursuant to Rule 433(d)(5)(i) because it contains a description of the Placement Shares or of the offering that does not reflect the final terms, in each case in the form filed or required to be filed with the Commission or, if not required to be filed, in the form retained in the Company's records pursuant to Rule 433(g) under the Securities Act.

"Rule 172," "Rule 405," "Rule 415," "Rule 424," "Rule 424(b)," "Rule 430B," and "Rule 433" refer to such rules under the Securities Act.

All references in this Agreement to financial statements and schedules and other information that is "contained," "included" or "stated" in the Registration Statement or the Prospectus (and all other references of like import) shall be deemed to mean and include all such financial statements and schedules and other information that is incorporated by reference in the Registration Statement or the Prospectus, as the case may be.

All references in this Agreement to the Registration Statement, the Prospectus or any amendment or supplement to any of the foregoing shall be deemed to include the copy filed with the Commission pursuant to EDGAR; all references in this Agreement to any Issuer Free Writing Prospectus (other than any Issuer Free Writing Prospectuses that, pursuant to Rule 433, are not required to be filed with the Commission) shall be deemed to include the copy thereof filed with the Commission pursuant to EDGAR; and all references in this Agreement to "supplements" to the Prospectus shall include, without limitation, any supplements, "wrappers" or similar materials prepared in connection with any offering, sale or private placement of any Placement Shares by the Agents outside of the United States.

[Remainder of the page intentionally left blank]

If the foregoing correctly sets forth the understanding between the Company and each of the Agents, please so indicate in the space provided below for that purpose, whereupon this letter shall constitute a binding agreement between the Company and each of the Agents.

Very truly yours,

ACTINIUM PHARMACEUTICALS, INC.

By: /s/ Sandesh Seth
Name: Sandesh Seth
Title: Chairman of the Board and CEO

ACCEPTED as of the date first-above written:

FBR CAPITAL MARKETS & CO.

By: /s/ Patrice McNicoll
Name: Patrice McNicoll
Title: Co-Head of Capital Markets

MLV & CO. LLC

By: /s/ Patrice McNicoll
Name: Patrice McNicoll
Title: Chief Executive Officer

JONESTRADING INSTITUTIONAL SERVICES LLC

By: /s/ Trent McNair
Name: Trent McNair
Title: Chief Financial Officer

SCHEDULE 1

FORM OF PLACEMENT NOTICE

From: Actinium Pharmaceuticals, Inc.
To: [●]
Attention: [●]
Subject: At Market Issuance--Placement Notice

Gentlemen:

Pursuant to the terms and subject to the conditions contained in the Amended and Restated At-the-Market Issuance Sales Agreement between Actinium Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and FBR Capital Markets & Co., MLV & Co. LLC and JonesTrading Institutional Services LLC (the "Agents"), dated July 3, 2017, the Company hereby requests that [*identify Designated Agent*] sell up to [_____] shares of the Company's Common Stock, $0.001 par value per share, at a minimum market price of $ per share, during the time period beginning [month, day, time] and ending [month, day, time].

SCHEDULE 2

Compensation

The Company shall pay to the Designated Agent in cash, upon each sale of Placement Shares pursuant to this Agreement, an amount equal to 3.0% of the gross proceeds from each sale of Placement Shares.

SCHEDULE 3

Notice Parties

The Company

Sandesh Seth sseth@actiniumpharma.com
Steve O'Loughlin soloughlin@actiniumpharma.com

FBR and MLV

Matthew Feinberg mfeinberg@fbr.com
Ryan Loforte rloforte@fbr.com
Patrice McNicoll pmcnicoll@fbr.com
Keith Pompliano kpompliano@fbr.com

with a copy to atmdesk@fbr.com and mlvlegal@mlvco.com

JonesTrading

Moe Cohen moec@jonestrading.com
Bryan Turley bturley@jonestrading.com
John D'Agostini johnd@jonestrading.com
Ryan Gerety ryang@jonestrading.com

With a copy to JTCM@jonestrading.com

SCHEDULE 6(g)

Subsidiaries

MedActinium, Inc.

EXHIBIT 7(1)

Form of Representation Date Certificate

_____, 20___

This Representation Date Certificate (this "Certificate") is executed and delivered in connection with Section 7(1) of the Amended and Restated At-the-Market Issuance Sales Agreement (the "Agreement"), dated July 3, 2017, and entered into between Actinium Pharmaceuticals, Inc. (the "Company") and FBR Capital Markets & Co., MLV & Co. LLC and JonesTrading Institutional Services LLC. All capitalized terms used but not defined herein shall have the meanings given to such terms in the Agreement.

The Company hereby certifies as follows:

1. As of the date of this Certificate (i) the Registration Statement does not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements therein not misleading and (ii) neither the Registration Statement nor the Prospectus contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading and (iii) no event has occurred as a result of which it is necessary to amend or supplement the Prospectus in order to make the statements therein not untrue or misleading for this paragraph 1 to be true.

2. Each of the representations and warranties of the Company contained in the Agreement were, when originally made, and are, as of the date of this Certificate, true and correct in all material respects.

3. Except as waived by the Agents in writing, each of the covenants required to be performed by the Company in the Agreement on or prior to the date of the Agreement, this Representation Date, and each such other date prior to the date hereof as set forth in the Agreement, has been duly, timely and fully performed in all material respects and each condition required to be complied with by the Company on or prior to the date of the Agreement, this Representation Date, and each such other date prior to the date hereof as set forth in the Agreement has been duly, timely and fully complied with in all material respects.

4. Subsequent to the date of the most recent financial statements in the Prospectus, and except as described in the Prospectus, including Incorporated Documents, there has been no Material Adverse Effect.

5. No stop order suspending the effectiveness of the Registration Statement or of any part thereof has been issued, and no proceedings for that purpose have been instituted or are pending or threatened by any securities or other governmental authority (including, without limitation, the Commission).

6. No order suspending the effectiveness of the Registration Statement or the qualification or registration of the Placement Shares under the securities or Blue Sky laws of any jurisdiction are in effect and no proceeding for such purpose is pending before, or threatened, to the Company's knowledge or in writing by, any securities or other governmental authority (including, without limitation, the Commission).

The undersigned has executed this Representation Date Certificate as of the date first written above.

ACTINIUM PHARMACEUTICALS, INC.

By: _____
Name: _____
Title: _____

EXHIBIT 23

Permitted Issuer Free Writing Prospectuses

None.

Exhibit 10.6

AGREEMENT

This Agreement ("Agreement") is entered into by and between Sergio Traversa ("Director" or "you") and Actinium Pharmaceuticals, Inc. (the "Company" or "Actinium"), and confirms the agreement that has been reached with you in connection with your resignation as a director of the Company (together, the "Parties").

1. *Director Resignation.* Based on discussions with the board of directors (the "Board") of the Company about your intent to focus your attention on matters external to Actinium, you and the Board mutually agree that your resignation shall be effective as of June 6, 2017 (the "Resignation Date") and as of such date you shall cease to be a member of the Board of the Company, including any Board committees (as well as of the Board of Directors of any of the Company's subsidiaries).

2. *Director Compensation.* In consideration of your execution of this Agreement and your compliance with its terms and conditions, the Company agrees to pay or provide you (subject to the terms and conditions set forth in this Agreement) within five days of the Resignation Date, with the Company's standard director compensation and committee fees until December 31, 2017.

3. *Options*. Each of your outstanding vested options, as well as 69,000 unvested options granted prior to December 31, 2016, to acquire Company common stock shall also be exercisable until the end of the term of each option grant agreement.

4. *Indemnification*. The agreements entered into by and between the Company and you and the indemnification sections of the other agreements shall remain in full force and effect and shall not limit any greater rights provided and/or available to you by any Directors and Officers liability insurance policy, applicable documents or as a matter of law.

5. *No Other Payments or Benefits.* You acknowledge and agree that, subject to Section 2 of this Agreement, other than the payments and benefits expressly set forth in this Agreement, you have received all compensation to which you are entitled from the Company, and you are not entitled to any other payments or benefits from the Company. The Company also agrees to directly pay to counsel of your choosing the legal expenses you incur in connection with this Agreement.

6. *Nondisparagement.* The Parties agree that each Party, will not, with intent to damage, disparage or encourage or induce others to disparage the other Party, including, as it relates to the Company, the Company's subsidiaries and affiliates, together with all of their respective past and present directors and officers and each of their successors and assigns (collectively, the "Company Entities and Persons"). Nothing in this Agreement is intended to or shall prevent you or the Company from providing, or limiting testimony in response to a valid subpoena, court order, regulatory request or other judicial, administrative or legal process or otherwise as required by law. The Parties each agree that each Party will notify the other Party in writing as promptly as practicable after receiving any request for testimony or information in response to a subpoena, court order, regulatory request or other judicial, administrative or legal process or otherwise as required by law, regarding the anticipated testimony or information to be provided and at least ten (10) days prior to providing such testimony or information (or, if such notice is not possible under the circumstances, with as much prior notice as is possible).

7. *Cooperation.* Prior to and after the Resignation Date, you agree that you will reasonably cooperate with the Company, its subsidiaries and affiliates, at any level, and any of their officers and directors, shareholders (A) concerning requests for information about the business of the Company or its subsidiaries or affiliates or your involvement and participation therein, (B) in connection with any investigation or review by the Company or any federal, state or local regulatory, quasi-regulatory or self-governing authority (including, without limitation, the Securities and Exchange Commission) as any such investigation or review relates to events or occurrences that transpired while you were a director of the Company and (C) with respect to transition and succession matters (although you and the Company agree that any such transition and succession matters shall be concluded by the Resignation Date). Your reasonable cooperation may include, but not be limited to (taking into account your personal and professional obligations, including those to any new employer or entity to which you provide services), being available to meet and speak with officers or employees of the Company and/or the Company's counsel at reasonable times and locations, executing accurate and truthful documents and taking such other actions as may reasonably be requested by the Company and/or the Company's counsel to effectuate the foregoing. You shall be entitled to reimbursement, upon receipt by the Company of suitable documentation, for reasonable and necessary travel and other expenses (including the reasonable attorneys' fees actually incurred in the event a conflict of interest between you and the Company necessitates you retaining your own counsel in order to provide the cooperation hereunder) which you may incur at the specific request of the Company and also any lost compensation due to fulfilling the obligations imposed by the Company or its representatives in such matters and as approved by the Company in advance and in accordance with its policies and procedures established from time to time.

8. Mutual Releases. You agree that, in consideration of this Agreement, you hereby waive, release and forever discharge any and all claims and rights which you ever had, now have or may have against the Company and any of its subsidiaries or affiliated companies, and their respective successors and assigns, current and former officers, agents, directors, representatives and employees, various benefits committees, and their respective successors and assigns, heirs, executors and personal and legal representatives (the "Company Released Parties"), based on any act, event or omission occurring before you execute this Agreement arising out of, during or relating to your services with the Company or the termination of such services, except as provided below. This waiver and release includes, but is not limited to, any claims which could be asserted now or in the future, under: common law, including, but not limited to, breach of express or implied duties, wrongful termination, defamation, or violation of public policy; any policies, practices, or procedures of the Company; any federal or state statutes or regulations. Notwithstanding the foregoing, the Parties agree that you are not waiving any claims or rights: (a) that may arise after the date on which you sign this Agreement, including the right to enforce this Agreement; (b) that cannot be released as a matter of law; (c) to accrued, vested benefits under any benefit, stock, savings, insurance or pension plan of the Company; and (d) to indemnification, advancement contribution or defense, which are expressly reserved as set forth in Section 4 hereof.

The Company Released Parties hereby waive, release and forever discharge any and all claims and rights which such party ever had, now has or may have against you, and your respective successors and assigns, and your respective successors and assigns, heirs, executors and personal and legal representatives, based on any act, event or omission occurring before you execute this Agreement arising out of, during or relating to your services with the Company or the termination of such services, except as provided in Section 9 below. This waiver and release includes, but is not limited to, any claims which could be asserted now or in the future, under: common law, including, but not limited to, breach of express or implied duties, wrongful termination, defamation, or violation of public policy; any policies, practices, or procedures of the Company; any federal or state statutes or regulations.

9. *Enforcement.* If any provision of this Agreement is held by a court of competent jurisdiction to be illegal, void or unenforceable, such provision shall have no effect; however, the remaining provisions shall be enforced to the maximum extent possible. Further, if a court should determine that any portion of this Agreement is overbroad or unreasonable, such provision shall be given effect to the maximum extent possible by narrowing or enforcing in part that aspect of the provision found overbroad or unreasonable. In addition, you agree that your willful and knowing failure to return Company property that relates to the maintenance of security of the Company Entities and Persons shall entitle the Company to injunctive and other equitable relief.

10. *Successors*. This Agreement is binding upon, and shall inure to the benefit of, the parties and their respective heirs, executors, administrators, successors and assigns.

11. *Choice of Law*. This Agreement shall be construed and enforced in accordance with the laws of the State of New York without regard to the principles of conflicts of law.

12. *Counterparts*. This Agreement may be executed in one or more counterparts, including emailed or telecopied facsimiles, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.(signature page follows)

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date set forth below.

Signature: Actinium Pharmaceuticals, Inc.

/s/ Sandesh Date: June 6, 2017
Sandesh Seth, Chairman & CEO

/s/ Sergio Traversa Date: June 6, 2017
Sergio Traversa

Actinium Pharmaceuticals, Inc.
Confidential

CONSULTING AGREEMENT

This Consulting Agreement (**"Agreement"**) is entered into on **May 22, 2017** (the **"Effective Date**") by and between **Actinium Pharmaceuticals, Inc.**, a Delaware corporation with a business address at 275 Madison Avenue, 7th Floor, New York, NY 10016 (the **"Company"**), and **Dragan Cicic** (**"Consultant"**).

WHEREAS, the Company desires that Consultant provide consulting services to assist the Company with the series describe on Schedule 1 (collectively referred to as the **"Services")**; and

WHEREAS, Consultant has the requisite knowledge and experience to provide the Services;

NOW, THEREFORE, the Company and Consultant agree as follows:

1. Activities. The Services shall be conducted according to the scope set forth herein.

2. Project Materials and Consultant Services.

2.1 The Company will from time to time provide Consultant with access to product information and documents, as well as reports and experimental data and other information, so as to enable Consultant to provide the Services.

2.2 Consultant agrees to communicate to the Company, its designees, successors, legal representatives or assigns, any facts or other information known to Consultant relating to the Services.

2.3 Consultant will provide to the Company weekly reports pertaining to the services performed under this Agreement. Consultant agrees to adhere to professional record keeping standards and such record keeping reports shall belong to the Company.

3. Reasonable Efforts. Consultant agrees to use all reasonable efforts to provide the Services required under this Agreement within a reasonable time period. Consultant shall perform Services conscientiously and in a professional manner, and devote his/h best efforts and abilities thereto. Consultant shall observe all policies and procedures of the Company.

4. Compliance with Laws/No Conflicting Agreement. The Services will be provided in accordance with, and Consultant will comply with, all federal, state, and local laws and regulations applicable to the Services. Consultant represents and warrants that Consultant is not a party to any existing agreement that would prevent Consultant from entering into and performing its obligations under this Agreement in accordance with its terms. Consultant shall not enter into any agreement that is in conflict with, or that would prohibit or impair the performance of, Consultant's obligations under this Agreement in accordance with its terms.

5. Payments and Expenses

5.1. Service Fee. In consideration of the Services to be performed under this Agreement, the Company shall provide compensation to Consultant for his activities hereunder in the amount of **(US $70,750***)* ("**Service Fee**"). The Service Fee shall be payable in bi-weekly installments over a period starting on May 22, 2017 and ending on August 21, 2017.

5.2. Expenses. In addition to the Service Fees referenced in paragraph 5.1 above, the Company will reimburse Consultant for reasonable and customary travel, lodging and out-of-pocket expenses incurred, in each case at the Company's written request, in connection with the performance of the Services. The Company will not be liable for payment of any travel, lodging or out-of-pocket expenses incurred by Consultant without the prior written authorization of the Company.

5.3. Payment Method.

The Service Fee payments shall be tendered in the form of checks payable to Dragan Cicic, and sent to Consultant at the following address via First Class U.S. mail: 393 17th Street, Apt 1A, Brooklyn, NY 11215

6. Independent Contractor. Consultant's relationship to the Company under this Agreement shall be that of an independent contractor and not an agent, joint venturer, or partner of the Company. Consultant will be responsible for all applicable federal, state and local withholding taxes and unemployment taxes, as well as social security, state disability insurance, workers' compensation and all other payroll charges payable to, or on behalf of, Consultant.

7. Debarment and Exclusion. Consultant represents, warrants and covenants that for the term of this Agreement, Consultant is not:

a) debarred under Section 306(a) or 306(b) of the United States Federal Food, Drug and Cosmetic Act, as may be amended and supplemented from time to time ("FDCA");

b) has not been charged with, or convicted of, any felony or misdemeanor within the ambit of 42 U.S.C. §§ 1320a-7(a), 1320a-7(b)(l)-(3), and is not proposed for exclusion during the term of this Agreement;

c) is not excluded, suspended or debarred from participation, or otherwise ineligible to participate, in any Federal or State health care programs (including convicted of a criminal offense that falls within the scope of 42 U.S.C. §1320a-7 but is not yet excluded, debarred, suspended, or otherwise declared ineligible), or excluded, suspended or debarred from participation, or otherwise ineligible to participate, in any Federal procurement or non-procurement programs.

Notwithstanding any provision in this Agreement to the contrary, the Company may immediately terminate this Agreement if Consultant violates any of the provisions of this paragraph 7. Consultant will notify the Company immediately, but in no event later than five (5) business days, after obtaining knowledge of any such exclusion, debarment, suspension or other ineligibility occurring during the term of this Agreement, or if any action or investigation is pending.

8. Effective Date and Term. The term of this Agreement shall begin on the Effective Date and shall continue for three (3) months thereafter unless earlier terminated pursuant to Section 9 (the period from the Effective Date through and including the termination date is the "Term").

9. Termination. Either party may terminate Consultant's services at any time and for any reason or no reason, upon 5 days written notice. If the Term is less than three (3) months, then the fee set forth in Section 5.1 shall be prorated.

10. The primary contact at the Company for this Agreement is its Executive Chairman or designee.

11. Data and Reporting. All written materials, comments, critiques, conclusions, data, analyses, models, graphs, equations, statistical methodologies and other relevant information generated or utilized by Consultant during and pursuant to performing the Services will be promptly and fully disclosed to the Company, and shall be freely usable in all respects by the Company consistent with good business judgment and in the Company's sole discretion. Subject to the provisions of Paragraph 12 below, Consultant shall be free to maintain a single archival copy of all materials generated by Consultant and related to the Services.

12. Confidential Information.

12.1. "Confidential Information" means all information provided by or on behalf of the Company to Consultant or generated by Consultant during and pursuant to performing the Services hereunder, whether in written or oral form.

12.2. Consultant shall use the Confidential Information solely for the purpose of performing the Services pursuant to this Agreement. Consultant shall keep all Confidential Information in confidence, and shall not disclose the Confidential Information to anyone. Consultant shall not disclose any Confidential Information (including through lecture, presentation, manuscript, abstract, poster or any other publication) without prior written authorization from the Company. This provision shall remain in effect for five (5) years following the termination of this Agreement.

12.3. Specifically excepted from the definition of Confidential Information is all information that:

a) is already known by Consultant at the time of disclosure by the Company as demonstrated by prior written records, and that is not the subject of a separate confidentiality agreement between the Company and Consultant; or

b) is already available or becomes available in print or other tangible form to the public through no fault of the Consultant;

c) is received by the Consultant from a third party who has the right to disclose it, and who did not receive it, directly or indirectly, from the Company; or

d) is independently developed by Consultant without use of, reference to or reliance on in any manner whatsoever the Confidential Information or any information that is the subject of a separate confidentiality agreement between the Company and Consultant.

12.4. Consultant agrees not to make copies of any the Company's disclosures or other Confidential Information other than those copies required by Consultant to perform the Services pursuant to this Agreement. Upon the Company's request, Consultant shall return to the Company all such information, including any copies thereof.

12.5. In the event that any Confidential Information is required to be disclosed pursuant to any judicial or government request, requirement or order, Consultant shall take reasonable steps to provide the Company with sufficient prior notice in order to allow the Company to contest such request, requirement or order. In such event, Consultant will cooperate reasonably with the Company, at the Company's expense, in seeking confidential treatment of such requested or compelled disclosure.

13. Publication. Consultant shall not use any Confidential Information or the results of the Services for teaching, research, education, clinical or publication purposes without the prior written consent of the Company.

14. Intellectual Property

14.1. Assignment of Inventions. Consultant shall promptly make full written disclosure to the Company, shall hold in trust for the sole right and benefit of the Company, and hereby assigns, transfers and conveys to the Company, or its designee, all of Consultant's worldwide right, title and interest in and to any and all inventions, original works of authorship, findings, conclusions, data, discoveries, developments, concepts, improvements, trade secrets, techniques, processes and know-how, whether or not patentable or registrable under patent, copyright or similar laws, that Consultant may solely or jointly conceive, develop or reduce to practice, or cause to be conceived, developed or reduced to practice, in the performance of the Services or that result, to any extent, from use of the Company's premises or property (collectively, the "Inventions"), including any and all moral rights and intellectual property rights inherent therein and appurtenant thereto, including, but not limited to, all patent rights, copyrights, trademarks, know-how and trade secrets and the rights to apply for the same (collectively, "Intellectual Property Rights"). Consultant further acknowledges and agrees that all original works of authorship that are made by Consultant (solely or jointly with others) in the performance of the Services (a "Work") and that are protectable by copyright are "works made for hire," as that term is defined in the United States Copyright Act. However, to the extent that any Work may not, by operation of any applicable law, be a work made for hire, Consultant hereby assigns, transfers and conveys to the Company all of Consultant's worldwide right, title and interest in and to such Work, including all Intellectual Property Rights relating thereto. Consultant will assist the Company, if requested by the Company, in processing patent applications and assisting with other Intellectual Property matters beyond 12 weeks consulting period at an hourly rate of $250 paid to Consultant plus all expenses.

14.2 Consultant acknowledges that he is under no obligation, and will be under no obligation, to assign his rights, if any, in the Intellectual Property to any other party. Consultant has not made any agreements, assignments, covenants or encumbrances inconsistent with the provisions of this Agreement and will not enter into any such agreements, assignments, covenants or encumbrances during the Term of this Agreement, unless instructed to do so by the Company, or expressly permitted to do so by the Company.

14.3. Consultant agrees to assist the Company, at the Company's expense, in preparing or supporting any applications for patent term extension (both domestic and foreign), and in preparing and prosecuting any and all applications for intellectual property protection, both domestic and foreign, on any and all Intellectual Property which the Company decides, in its sole discretion, to protect in accordance with this Paragraph 14.

14.4. Consultant agrees to communicate to the Company, its designees, successors, legal representatives or assigns, any facts or other information known to Consultant relating to any of said Intellectual Property. Consultant also agrees to testify in any subsequent legal proceeding, sign any and all lawful papers, execute any and all provisional, parent, divisional, continuing, reissue and foreign applications, make all rightful oaths and declarations, and generally do everything possible to assist the Company, its designees, successors, legal representatives or assigns, at the Company's expense, to obtain, maintain, defend, extend, and enforce said Intellectual Property in any and all countries worldwide at the Company's sole discretion.

14.5 Further Assurances. Upon the request and at the expense of the Company, Consultant shall execute and deliver any and all instruments and documents and take such other acts as may be necessary or desirable to document the assignment and transfer described in Section 5.1 or to enable the Company to secure its rights in the Inventions, Works and Intellectual Property Rights relating thereto in any and all jurisdictions, or to apply for, prosecute and enforce Intellectual Property Rights in any and all jurisdictions with respect to any Inventions or Works, or to obtain any extension, validation, re-issue, continuance or renewal of any such Intellectual Property Right. Without limiting the foregoing, Consultant shall disclose to the Company all pertinent information and data with respect thereto and shall execute all applications, specifications, oaths and all other instruments which the Company deems necessary in order to apply for and obtain such rights and in order to assign and convey to the Company the sole and exclusive right, title and interest in and to such Inventions, Works and any Intellectual Property Rights relating thereto. If the Company is unable for any other reason to secure Consultant's signature to apply for or to pursue any application for any United States or foreign patent, trademark, copyright or other registration covering Inventions or Works assigned to the Company hereunder, then Consultant hereby irrevocably designates and appoints the Company and its duly authorized officers and agents as Consultant's agent and attorney in fact, to act for and in Consultant's behalf and stead to execute and file any such applications and to do all other lawfully permitted acts to further the prosecution and issuance of letters patent or trademark, copyright or other registrations thereon with the same legal force and effect as if executed by Consultant.

15. The Company agrees that Consultant's services are provided without representation or warranty pf any kind. The Company acknowledges that drug development carries inherent risks and that no particular work product or business result is guaranteed under this Agreement.

16. Use of a Party's Name. Neither party (Company or Consultant) will, without the prior written consent of the other party, use in advertising, publicity, or otherwise, the name, trademark, logo, symbol, or other image of the other party or that party's employee(s) or agent(s).

17. Adverse Event Reporting. As part of doing business with the Company, Consultant agrees to assist the Company in ensuring that any Adverse Events (AEs) or Product Complaints (PCs) involving the Company's products that Consultant becomes aware of are appropriately reported.

18. Notice. Any notice or other communication required or permitted under this Agreement shall be in writing and will be deemed given as of the date it is received by the receiving party. Notice shall be given to the parties at the addresses listed below:

As to Consultant:	**Dragan Cicic** **393 17th Street Apt 1A** **Brooklyn NY 11215**
As to the Company:	**Actinium Pharmaceuticals, Inc.** **757 Madison Avenue, 7th Floor** **New York, NY 10016** **Attn: Executive Chairman**

19. Modification. Any alteration, modification, or amendment to this Agreement must be in writing and signed by both parties.

20. Assignment. Consultant may not assign any of its rights or obligations under this Agreement without the prior written consent of the Company. The Company may freely assign any of its rights and obligations under this Agreement to any of its Associated Companies. [1] No assignment shall relieve either party of the performance of any accrued obligation that such party may have under this Agreement.

21. **Force Majeure.** Neither party shall be liable for any delay or failure to perform as required by this Agreement to the extent that such delay or failure to perform is caused by circumstances reasonably beyond either party's control, including without limitation labor disputes, accidents, any law, order or requirement of any governmental agency or authority, civil disorders or commotions, acts of aggression, fire or other casualty, strikes, acts of God, explosions, or material shortages. Performance time shall be considered extended for a period of time equivalent to the time lost because of any such delay or failure to perform; however, in any event, this extension of time shall not exceed fifteen (15) days unless the parties agree otherwise in writing.

22. Applicable Law. This Agreement will in all respects be governed by, and interpreted, construed and enforced in accordance with, the laws of the State of New York. The parties further agree that any action or proceeding arising out of or in connection with this Agreement will be venued in a federal or state court of appropriate venue and subject matter jurisdiction located in the State of New York. Each party hereto irrevocably consents to the personal jurisdiction of the courts in the State of New York.

23. **IRS EIN and W-9.** Consultant will complete and submit to the Company a US Internal Revenue W-9 Form. Consultant acknowledges that the Company will rely upon the foregoing certification in filing certain documents and instruments required by law in connection with this Agreement, including, without limitation, Form 1099 under the Internal Revenue Code of 1986, as amended (or any successor form).

24. Waiver. No waiver of any term, provision or condition of this Agreement, whether by conduct or otherwise in any one or more instances, shall be deemed to be, or be construed as, a further or continuing waiver of any such term, provision, or condition, or of any other term, provision or condition of this Agreement.

25. Entire Agreement. This Agreement, together with all Exhibits, constitutes the entire agreement between the parties with respect to the subject matter contained herein. This Agreement supersedes all prior understandings and agreements between the parties with respect to the subject matter contained herein. For the avoidance of doubt, the separation and Settlement Agreement dated May 12, 2017 remains in full force and effect. This Agreement and the rights and obligations set forth herein may not be modified, amended or waived, whether in whole or in part, except by a writing signed by both parties.

[1] As used in this Agreement, "Associated Company(ies)" shall mean any person, firm, trust, partnership, corporation, company or other entity or combination thereof, which directly or indirectly (a) controls a party (b) is controlled by a party or (c) is under common control with a party. The terms "control" and "controlled" meaning ownership of fifty percent (50%) or more, including ownership by trusts with substantially the same beneficial interests, of the voting and equity rights of such person, firm, trust, corporation or other entity or combination thereof or the power to direct the management of such person, firm, trust, corporation or other entity or combination thereof.

WHEREFORE, the parties hereto place their hands and seals:

Dragan Cicic	**ACTINIUM PHARMACEUTICALS, INC.**
/s/ Dragan Cicic	By: /s/ Sandesh Seth

SCHEDULE 1

SERVICES

1. Assist Company in understanding, analyzing and upgrading Actimab-A database

2. Assist with all business development activity as needed

3. Effectively transition projects set forth below to Company Dessignee

   a. antiCD38-Ac225 preclinical program
   b. venetoclax in combination with Actimab-A preclinical program
   c. Astellas Fab fragments Ac225 labeling and preclinical development program
   d. Actimab-A MDS expansion program
   e. Actimab-A in transplant program
   f. Iomab-B in combination with CAR-T program
   g. Other as applicable

4. Advise the Company on matters regarding clinical and preclinical development, such as experimental pathways, clinical trial designs, modifications in clinical trials etc.

5. Provide medical and scientific input in regard to any regulatory questions arising and advise on regulatory strategies in that respect

6. Advise the Company on certain manufacturing and quality control issues related primarily to their potential implications regarding safety and efficacy of Company's drug candidates for both preclinical and clinical programs

7. Provide written reports as requested by the Company based on the data provided from preclinical experiments and clinical trials

8. Provide presentations on all of the above if requested

9. Review reports and presentations on the above matters prepared by the Company and provide inputs on the same

10. If requested, deliver presentations on the above matters to scientists, potential and actual investors and/or other appropriate audiences

11. Liaise with relevant scientists and other opinion leaders on behalf of the Company, if requested, to enable and/or facilitate their collaboration with the Company

12. Assist the Company in discussions with potential and/or actual development partners on both preclinical and clinical programs

13. Assist Company in preparing and filing patent applications related to all of the above

14. Make appropriate introductions to outside parties to enable successful transition and provide comprehensive list of contacts with contact information related to above projects

Exhibit 10.8

SEPARATION AND SETTLEMENT AGREEMENT

BY AND BETWEEN

ACTINIUM PHARMACEUTICALS, INC.

AND

DR. KAUSHIK J. DAVE

This Separation and Settlement Agreement ("Agreement"), dated as of May 12, 2017 (the "Effective Date"), is made by and between Actinium Pharmaceuticals, Inc., a Delaware company ("Actinium" or the "Company"), and Dr. Kaushik J. Dave ("Employee").

WHEREAS, Employee was employed by the Company pursuant to the terms of an employment agreement effective August 6, 2015 (the "Employment Agreement"); and

WHEREAS, Employee commenced employment with Actinium on September 16, 2013 (the "Start Date"); and

WHEREAS, Employee and the Company have mutually agreed that Employee's employment with the Company will terminate effective May 12, 2017, and that Employee shall also resign as a director effective May 12, 2017 (the "Separation Date"); and

WHEREAS, the Company and Employee wish to memorialize the terms of Employee's departure from the Company and each of Employee and the Company's rights and responsibilities in connection with his departure; and

WHEREAS, Employee has agreed to release the Company and the Company has agreed to release Employee from any claims.

NOW, THEREFORE, in consideration of the mutual promises made herein, the Company and Employee (collectively referred to as the "Parties") hereby agree as follows:

1. Termination of Employment and Directorship. Employee's last day of employment will be May 12, 2017. Employee also is resigning as a Director of Actinium effective May 12, 2017.

2. Separation Payments. In full settlement of its obligations to Employee:

   A. By the date of its next regularly scheduled payroll, if not already paid prior to the date of this Agreement, the Company will pay to Employee all amounts due in respect of services rendered from the date of the last payroll at which Employee was paid until and through the date of May 12, 2017.

   B. The Company shall pay Employee $410,000, less tax withholdings, on its next regularly scheduled payroll.

C. If the Employee timely and properly elects COBRA continuation coverage under the Company's group health plan, the Employee shall only be required to pay active employee rates, as in effect from time to time, for twelve months. At the conclusion of this period, the Employee shall be eligible to continue his coverage, pursuant to COBRA, and shall be responsible for the entire COBRA premium for the remainder of the applicable COBRA continuation period.

3. Separation, Payments, Benefits and Related Matters.

(a) The Parties agree that, except as provided in this Agreement, there are no further sums or benefits due or owing to Employee pursuant to this Agreement or any prior employment agreement, amendment to such agreement, or any other legal or contractual obligation.

(b) The Parties agree that, except for the Confidential Information and Invention Assignment Agreement executed by Employee on September 12, 2013 (the "CIIAA"), which shall remain in full force and effect, any other agreements shall be of no further effect as of the date of this Agreement (other than Employee's post-termination obligations under Sections 9 and 15 of the Employment Agreement and any indemnification/advancement agreements including the one attached as Exhibit B to the Employment Agreement, a copy of which was filed with the 10-Q as Exhibit 10.3 on August 7, 2015, which shall remain in full force and effect).

4 . Release of Claims. In consideration for the obligations of the Company set forth in this Agreement, Employee, on behalf of himself, and his respective heirs, executors, officers, directors, shareholders, employees, agents and consultants, investors, stockholders, administrators and assigns, as may be applicable, hereby fully and forever release the Company and its respective heirs, executors, officers, directors, employees, agents, investors, stockholders, administrators, parent, subsidiary and affiliate companies, predecessor and successor companies and assigns, of and from any claim, duty, obligation or cause of action relating to any matters of any kind that any of them may possess arising from any omissions, acts or facts that have occurred from the beginning of time up until and including the date of this Agreement including, without limitation:

(a) any and all claims relating to or arising from Employee's employment or directorship relationship with the Company and the termination of those relationships, including, without limitation Employee's rights to salary and benefits except as provided herein;

(b) any and all claims for wrongful discharge of employment; breach of contract, both express and implied; breach of a covenant of good faith and fair dealing, both express and implied, negligent or intentional infliction of emotional distress; negligent or intentional misrepresentation; negligent or intentional interference with contract or prospective economic advantage; negligence; and defamation;

(c) any and all claims for violation of any federal, state or municipal statute, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, the Age Discrimination in Employment Act of 1967, and the Americans with Disabilities Act of 1990, the Older Workers Benefits Protection Act of 1990, the Americans with Disabilities Act, the Family and Medical Leave Act, and all other federal, state and local laws dealing with discrimination on any basis, including but not limited to sex, race, national origin, veteran status, religion, disability and age. This Agreement also includes any claim of wrongful termination, based on any legal theory including but not limited to contract and personal injury;

(d) any and all claims arising out of any other laws and regulations relating to employment or employment discrimination; and

(e) any and all claims for attorneys' fees and costs.

The Company and Employee agree that the release set forth in this Paragraph 4 shall be and remain in effect in all respects as a complete general release as to the matters released. This release does not extend to: (i) any payments or benefits receivable, or obligations incurred or specified under this Agreement, (ii) any rights that Employee may have under any 401-k plan, or (iii) any rights of Employee to indemnification or advancement to the fullest extent permitted under the Company's by-laws or pursuant to applicable law or under any applicable directors' and officers' liability insurance policies maintained by the Company (including, without limitation, Employee's right to advancement under Exhibit B to the Employment Agreement, any Company policy, pursuant to any insurance arrangement, or any other agreement).

5 . Company Release. In consideration for the obligations of the Employee set forth in this Agreement, the Company, on behalf of itself and its officers and directors hereby fully and forever release the Employee and his heirs, executors, agents, and assigns, of and from any claim, duty, obligation or cause of action relating to any matters of any kind that any of them may possess arising from any omissions, acts or facts that have occurred from the beginning of time up until and including the date of this Agreement.

6. Covenants.

(a) Future Acts. Employee agrees and covenants that (i) he shall not divulge to any person or entity other than the Company, including its directors, officers, employees, and agents, without express written authorization of the Board appointed designee, or upon appointment of a CEO, the CEO or his or her designee, any proprietary or confidential information, whether written or oral, received or gained by him in the course of his employment by the Company or of his duties with the Company ("Confidential Information"), nor shall he make use of any such Confidential Information on his own behalf or on behalf of any other person or entity, for so long as such Confidential Information is not known to the general public; (ii) he has or shall return or cause to be returned to the Company any and all property of the Company of any kind or description whatsoever, including, but not limited to: (1) any Confidential Information, which has been furnished to him or is held by him, at his residence or elsewhere, and shall not retain any copies, duplicates, reproductions or excerpts thereof; and (2) all personal property belonging to the Company, such as, without limitation, Company records, records pertaining to projects that the Company is or may become involved in, laptop computer, desktop computer and any peripheral items used for the such equipments. Employee understands and agrees that his obligations to the Company under this paragraph survive the termination of his relationship with the Company under this Agreement; and (iii) that he has vacated or will vacate his office at the Company immediately, and shall return to the Company premises only upon prior written consent of either the of the Board appointed designee, or upon appointment of a CEO, the CEO or his or her designee. For the avoidance of doubt, counsel for the Parties may retain a copy of any Company correspondence or documents in counsel's possession, and in any subsequent dispute between the Parties such documents be accessed by the Parties.

(b) Confidentiality of this Agreement. The Parties each agree to use their best efforts to maintain in confidence the existence of this Agreement, the contents and terms of this Agreement, and the consideration for this Agreement (hereinafter collectively referred to as "Separation Information"). Each Party hereto agrees to take every reasonable precaution to prevent disclosure of any Separation Information to third parties, except as may be disclosed in a mutually agreed upon press release and except for disclosures required by law or necessary to effectuate the terms of this Agreement. The Parties agree to take every precaution to disclose Separation Information only to those employees, officers, directors, attorneys, accountants, financial advisors, prospective employers of Employee, governmental entities and family members who have a reasonable need to know of such Separation Information. Employee acknowledges that the Company has certain disclosure obligations that may supersede this Agreement.

(c) Nonsolicitation. Employee agrees that for one year he will not either directly or indirectly solicit, induce, recruit or encourage any of the Company's officers or employees to terminate their relationship with the Company, or attempt to solicit, induce, recruit or encourage officers, employees or of the Company, either for his own benefit or for the benefit of any other person or entity. Further, Employee agrees that he will not use any confidential or proprietary information of the Company to attempt to negatively influence any of the Company's employees from remaining in the Company or to solicit or influence or attempt to solicit or influence any employee either directly or indirectly, to join another Company, institution or other entity in competition with the business of the Company. Employee agrees that he will be able to earn a livelihood without violating the restrictions set forth in this Paragraph 6(c). Further, for a period of twenty four (24) months from the date of this Agreement, he shall not attempt to negatively influence any of the Company's client's or customers from purchasing Company products or services or to solicit or influence any client, customer or other person either directly or indirectly, to direct his or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company. Employee agrees that the character and duration of this Paragraph 6(c) are reasonable in light of the circumstances as they exist on the date of this Agreement.

For a period of twenty four (24) months from the Separation Date, without the prior written consent of the Company neither Employee nor any of his affiliates or representatives will (i) acquire or agree, offer, seek or propose to acquire, ownership (including, but not limited to, beneficial ownership as defined in Rule 13d-3 under the Exchange Act of 1934, as amended (the "Exchange Act") of the assets or business or more than fifteen (15%) percent of the outstanding securities issued by the Company or any of its subsidiaries, (ii) make, or in any way participate in, any "solicitation" of "proxies" (as such terms are defined under Regulation 14A of the Exchange Act) to vote or seek to advise or influence in any matter whatsoever any person or entity with respect to the voting securities of the Company or any to his subsidiaries; (iii) form, join or in any way participate in a "group" (within the meaning of Section 13 (d)(3) of the Exchange Act) with respect to any voting securities of the Company or any of his subsidiaries.

7 . Non-Disparagement. Responses to Inquiries. Except (X) when required to do so by a lawful order of a court of competent jurisdiction, any governmental authority or agency, or any recognized subpoena power or (Y) as necessary to prosecute his rights against the Company under this Agreement, Employee agrees (i) to refrain, and to cause any person acting on his behalf to refrain from any knowing disparagement or defamation of the Company or its officers, directors, employees, or agents, or tortious interference with the contracts and relationships of the Company and (ii) that he will respond to any inquiries from any third party that he "left to pursue other business interests, enjoyed the opportunity to contribute to the Company and wishes the Company the best of luck in its future endeavors." Except (X) when required to do so by a lawful order of a court of competent jurisdiction, any governmental authority or agency, or any recognized subpoena power or (Y) as necessary to prosecute its rights against the Employee under this Agreement, the Company agrees (i) to refrain from, and to cause any person acting on its behalf to refrain from any knowing disparagement or defamation of Employee, or tortious interference with the contracts and relationships of Employee and (ii) that it will respond to any inquiries from third parties regarding Employee's departure from the Company with a statement that "Employee has left the Company to pursue other business interests. The Company is grateful for his contributions to the Company and wishes him the best of luck in his future endeavors."

8 . Breach of this Agreement. The Parties acknowledge that upon material breach of any provision of this Agreement by Employee of the Company, the Company or Employee, as the case may be, would sustain irreparable harm from such breach, and therefore, Employee and Company hereby mutually represent, warrant and covenant that they have not violated and will not violate any of the terms or provisions contained herein. Employee and the Company also mutually agree that in addition to any other remedies which theey may have for any material breach of this Agreement or otherwise, the Company or the Employee, as the ase may be, shall be entitled to obtain equitable relief including specific performance and injunctions restraining Employee or the Company, as the case may be, from committing or continuing any such violation of this Agreement.

9 . No Admission. The parties acknowledge and agree that this Agreement does not constitute and should not be construed in any way as an admission by any other party of (a) any wrongdoing or liability whatsoever, (b) any violation of the Employee's or the Company's rights or those of any other person, or (c) any violation of any order, law, statute, duty or contract. The Company specifically disclaims any liability for any alleged wrongdoing or liability, for any alleged violation of Employee's rights or those of any other person, or for any alleged violation of any order, law, statute, duty, or contract and Employee specifically disclaims any liability for any alleged wrongdoing or liability, for any alleged violation of the Company's rights or those of any other person, or for any alleged violation of any order, law, statute, duty, or contract.

10 . Authority. The Company represents and warrants that the undersigned has the authority to act on behalf of the Company and to bind the Company and all who may claim through it to the terms and conditions of this Agreement. Employee represents and warrants that he fully understands the provisions contained in this agreement and that he has the capacity to act on his own behalf and on behalf of all who might claim through him to bind them to the terms and conditions of this Agreement.

11. No Representations. Neither Party has relied upon any representations or statements made by the other Party hereto which are not specifically set forth in this Agreement.

12 . Severability. In the event that any provision hereof becomes or is declared by a court or other tribunal of competent jurisdiction to be illegal, unenforceable or void, this Agreement shall continue in full force and effect without said provision.

13 . Arbitration/Attorneys Fees. The Parties agree that Sections 10 and 14 of the Employment Agreement shall govern any disputes regarding this Agreement.

14. Successors. This Agreement shall inure to the benefit of and be enforceable by Employee's heirs and beneficiaries. This Agreement shall inure to the benefit of and be binding upon the Company and its respective successors, purchasers and assigns.

15. Entire Agreement. This Agreement represents the entire agreement and understanding between the Company and Employee concerning Employee's separation from the Company, and shall supersede and replace any and all prior agreements and understandings concerning Employee's relationship with the Company and his compensation by the Company, including but not limited to the Employment Agreement (other than as set forth in this Agreement).

16. No Oral Modification. This Agreement may only be amended in writing signed by Employee and the Company.

17. Construction. Whenever used in this Agreement, the singular shall be construed to include the plural and vice versa, where applicable, and the use of the masculine, feminine or neuter gender shall include the other genders. The subject matter and language of this Agreement has been the subject of negotiations between the parties and their respective counsel, and this Agreement has been jointly prepared by their respective counsel. Accordingly, this Agreement shall not be construed against any party on the basis that this Agreement was drafted by such party or its counsel. Headings of section and subsections are for convenience of reference only, and shall not be construed as a part of this Agreement, or as limiting or defining the scope of any term or provision hereof.

18. Governing Law. This Agreement shall be governed by the laws of the State of New York, without regard to its conflicts of law provisions.

19. Counterparts. This Agreement may be executed in counterparts, and each counterpart shall have the same force and effect as an original and shall constitute an effective, binding agreement on the part of each of the undersigned. This Agreement may be executed via facsimile or e-mail and signatures delivered via facsimile or e-mail shall be effective for all purposes.

20. Voluntary Execution of Agreement. This Agreement is executed voluntarily and without any duress or undue influence on the part or behalf of the Parties hereto, with the full intent of releasing all claims. The Parties acknowledge that:

(a) they have read this Agreement;

(b) they have been represented in the preparation, negotiation, and execution of this Agreement by legal counsel of their own choice or that they have voluntarily declined to seek such counsel;

(c) they understand the terms and consequences of this Agreement and of the releases it contains; and

(d) they are fully aware of the legal and binding effect of this Agreement.

21. Execution and Revocation Rights.

(a) This Agreement is intended to satisfy the requirements of the OWPBA. The Employee further agrees that he is advised by this Agreement, as required by the OWPBA, that (i) this waiver and release does not apply to any rights and claims that may arise after the effective date of this Agreement, (ii) he has the right to consult with an attorney prior to signing this Agreement, (iii) he may have at least twenty one (21) days to consider this Agreement, (iv) he has seven (7) days following his execution of this Agreement to revoke this Agreement, (v) this Agreement shall not be effective until the revocation period has expired, therefore making the effective date the eighth (8th) day after this Agreement is executed by the Employee.

(b) By executing this Agreement, the Employee acknowledges that the Employee has been advised by a representative of the Company that he has twenty-one (21) days within which to consider this Agreement before signing the same and that the Employee has, in fact, been given at least twenty-one (21) days within which to consider this Agreement prior to signing this Agreement.

(a) Following his signing of the Agreement, Employee has the right to revoke the Agreement at any time within seven (7) calendar days of him signing it, not including the date of his signing (the "Revocation Period"). Notice of Revocation shall be given in writing and sent by overnight mail no later than the seventh (7th) day following the date Employee signs this Agreement. The Notice of Revocation shall be sent to the Board of Directors of the Company. If Employee does not revoke the Agreement, this Agreement shall be deemed to be effective and to be enforceable as of the last date set forth opposite any signature hereto. If Employee gives Notice of Revocation during the Revocation Period in the manner specified above, this Agreement shall become null and void and all rights and claims of the parties which would have existed, but for the execution of this Agreement shall be restored.

[Signatures Follow on Next Page]

IN WITNESS WHEREOF, the Parties have executed this Separation and Settlement Agreement on the respective dates set forth below.

ACTINIUM PHARMACEUTICALS, INC.	KAUSHIK J. DAVE, An Individual
By: /s/ Sandesh Seth Its: Executive Chairman	/s/ Kaushik J. Dave
Date: May 12, 2017	Date: May 12, 2017

Exhibit 10.9

SEPARATION AND SETTLEMENT AGREEMENT

BY AND BETWEEN

ACTINIUM PHARMACEUTICALS, INC.

AND

DRAGAN CICIC

This Separation and Settlement Agreement ("Agreement"), dated as of May 12, 2017 (the "Effective Date"), is made by and between Actinium Pharmaceuticals, Inc., a Delaware company ("Actinium" or the "Company"), and Dragan Cicic ("Employee").

WHEREAS, Employee was employed by the Company pursuant to the terms of an employment agreement effective January 2, 2006, as amended (the "Employment Agreement"); and

WHEREAS, Employee commenced employment with Actinium in or about January 2, 2006 (the "Start Date"); and

WHEREAS, Employee and the Company have mutually agreed that Employee's employment with the Company will terminate effective May 12, 2017 (the "Separation Date"); and

WHEREAS, the Company and Employee wish to memorialize the terms of Employee's departure from the Company and each of Employee and the Company's rights and responsibilities in connection with his departure; and

WHEREAS, Employee has agreed to release the Company and the Company has agreed to release Employee from any claims.

NOW, THEREFORE, in consideration of the mutual promises made herein, the Company and Employee (collectively referred to as the "Parties") hereby agree as follows:

1. Termination of Employment. Employee's last day of employment will be May 12, 2017.

2. Separation Payments. In full settlement of its obligations to Employee:

A. By the date of its next regularly scheduled payroll, if not already paid prior to the date of this Agreement, the Company will pay to Employee all amounts due in respect of services rendered from the date of the last payroll at which Employee was paid until and through the date of May 12, 2017.

B. The Company shall pay Employee $283,000, less tax withholdings, on its next regularly scheduled payroll.

C. If the Employee timely and properly elects COBRA continuation coverage under the Company's group health plan, the Employee shall only be required to pay active employee rates, as in effect from time to time, for six months. At the conclusion of this period, the Employee shall be eligible to continue his coverage, pursuant to COBRA, and shall be responsible for the entire COBRA premium for the remainder of the applicable COBRA continuation period.

3. Separation, Payments, Benefits and Related Matters.

(a) The Parties agree that, except as provided in this Agreement, there are no further sums or benefits due or owing to Employee pursuant to this Agreement or any prior employment agreement, amendment to such agreement, or any other legal or contractual obligation.

(b) The Parties agree that any other agreements shall be of no further effect as of the date of this Agreement (other than the parties the provisions set forth Sections 7, 8, 9 and 11 of the Employment Agreement, and any indemnification/advancement agreements, which shall remain in full force and effect).

4. Release of Claims. In consideration for the obligations of the Company set forth in this Agreement, Employee, on behalf of himself, and his respective heirs, executors, officers, directors, shareholders, employees, agents and consultants, investors, stockholders, administrators and assigns, as may be applicable, hereby fully and forever release the Company and its respective heirs, executors, officers, directors, employees, agents, investors, stockholders, administrators, parent, subsidiary and affiliate companies, predecessor and successor companies and assigns, of and from any claim, duty, obligation or cause of action relating to any matters of any kind that any of them may possess arising from any omissions, acts or facts that have occurred from the beginning of time up until and including the date of this Agreement including, without limitation:

(a) any and all claims relating to or arising from Employee's employment relationship with the Company and the termination of those relationships, including, without limitation Employee's rights to salary and benefits except as provided herein;

(b) any and all claims for wrongful discharge of employment; breach of contract, both express and implied; breach of a covenant of good faith and fair dealing, both express and implied, negligent or intentional infliction of emotional distress; negligent or intentional misrepresentation; negligent or intentional interference with contract or prospective economic advantage; negligence; and defamation;

(c) any and all claims for violation of any federal, state or municipal statute, including, but not limited to, Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, the Age Discrimination in Employment Act of 1967, and the Americans with Disabilities Act of 1990, the Older Workers Benefits Protection Act of 1990, the Americans with Disabilities Act, the Family and Medical Leave Act, and all other federal, state and local laws dealing with discrimination on any basis, including but not limited to sex, race, national origin, veteran status, religion, disability and age. This Agreement also includes any claim of wrongful termination, based on any legal theory including but not limited to contract and personal injury;

(d) any and all claims arising out of any other laws and regulations relating to employment or employment discrimination; and

(e) any and all claims for attorneys' fees and costs.

The Company and Employee agree that the release set forth in this Paragraph 4 shall be and remain in effect in all respects as a complete general release as to the matters released. This release does not extend to: (i) any payments or benefits receivable, or obligations incurred or specified under this Agreement, (ii) any rights that Employee may have under any 401-k plan or (iii) any rights of Employee to indemnification or advancement to the fullest extent permitted under the Company's by-laws or pursuant to applicable law or under any applicable directors' and officers' liability insurance policies maintained by the Company (including, without limitation, Employee's right to advancement under any Company policy, pursuant to any insurance arrangement, or any other agreement).

5. Company Release. In consideration for the obligations of the Employee set forth in this Agreement, the Company, on behalf of itself and its officers and directors hereby fully and forever release the Employee and his heirs, executors, agents, and assigns, of and from any claim, duty, obligation or cause of action relating to any matters of any kind that any of them may possess arising from any omissions, acts or facts that have occurred from the beginning of time up until and including the date of this Agreement.

6. Covenants.

(a) Future Acts. Employee agrees and covenants that (i) he shall not divulge to any person or entity other than the Company, including its directors, officers, employees, and agents, without express written authorization of the Board appointed designee, or upon appointment of a CEO, the CEO or his or her designee, any proprietary or confidential information, whether written or oral, received or gained by him in the course of his employment by the Company or of his duties with the Company ("Confidential Information"), nor shall he make use of any such Confidential Information on his own behalf or on behalf of any other person or entity, for so long as such Confidential Information is not known to the general public; (ii) he has or shall return or cause to be returned to the Company any and all property of the Company of any kind or description whatsoever, including, but not limited to: (1) any Confidential Information, which has been furnished to him or is held by him, at his residence or elsewhere, and shall not retain any copies, duplicates, reproductions or excerpts thereof; and (2) all personal property belonging to the Company, such as, without limitation, Company records, records pertaining to projects that the Company is or may become involved in, laptop computer, desktop computer and any peripheral items used for the such equipments. Employee understands and agrees that his obligations to the Company under this paragraph survive the termination of his relationship with the Company under this Agreement; and (iii) that he has vacated or will vacate his office at the Company immediately, and shall return to the Company premises only upon prior written consent of either the of the Board appointed designee, or upon appointment of a CEO, the CEO or his or her designee. For the avoidance of doubt, counsel for the Parties may retain a copy of any Company correspondence or documents in counsel's possession, and in any subsequent dispute between the Parties such documents be accessed by the Parties.

(b) Confidentiality of this Agreement. The Parties each agree to use their best efforts to maintain in confidence the existence of this Agreement, the contents and terms of this Agreement, and the consideration for this Agreement (hereinafter collectively referred to as "Separation Information"). Each Party hereto agrees to take every reasonable precaution to prevent disclosure of any Separation Information to third parties, except as may be disclosed in a mutually agreed upon press release and except for disclosures required by law or necessary to effectuate the terms of this Agreement. The Parties agree to take every precaution to disclose Separation Information only to those employees, officers, directors, attorneys, accountants, financial advisors, prospective employers of Employee, governmental entities and family members who have a reasonable need to know of such Separation Information. Employee acknowledges that the Company has certain disclosure obligations that may supersede this Agreement.

(c) Nonsolicitation. Employee agrees that for one year he will not either directly or indirectly solicit, induce, recruit or encourage any of the Company's officers or employees to terminate their relationship with the Company, or attempt to solicit, induce, recruit or encourage officers or employees of the Company, either for his own benefit or for the benefit of any other person or entity. Further, Employee agrees that he will not use any confidential or proprietary information of the Company to attempt to negatively influence any of the Company's employees from remaining in the Company or to solicit or influence or attempt to solicit or influence any employee either directly or indirectly, to join another Company, institution or other entity in competition with the business of the Company. Employee agrees that he will be able to earn a livelihood without violating the restrictions set forth in this Paragraph 6(c). Further, for a period of twenty four (24) months from the date of this Agreement, he shall not attempt to negatively influence any of the Company's client's or customers from purchasing Company products or services or to solicit or influence any client, customer or other person either directly or indirectly, to direct his or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company. Employee agrees that the character and duration of this Paragraph 6(c) are reasonable in light of the circumstances as they exist on the date of this Agreement.

For a period of twenty four (24) months from the Separation Date, without the prior written consent of the Company neither Employee nor any of his affiliates or representatives will (i) acquire or agree, offer, seek or propose to acquire, ownership (including, but not limited to, beneficial ownership as defined in Rule 13d-3 under the Exchange Act of 1934, as amended (the "Exchange Act") of the assets or business or more than fifteen (15%) percent of the outstanding securities issued by the Company or any of its subsidiaries, (ii) make, or in any way participate in, any "solicitation" of "proxies" (as such terms are defined under Regulation 14A of the Exchange Act) to vote or seek to advise or influence in any matter whatsoever any person or entity with respect to the voting securities of the Company or any to his subsidiaries; (iii) form, join or in any way participate in a "group" (within the meaning of Section 13 (d)(3) of the Exchange Act) with respect to any voting securities of the Company or any of his subsidiaries.

7. Non-Disparagement. Responses to Inquiries. Except (X) when required to do so by a lawful order of a court of competent jurisdiction, any governmental authority or agency, or any recognized subpoena power or (Y) as necessary to prosecute his rights against the Company under this Agreement, Employee agrees (i) to refrain, and to cause any person acting on his behalf to refrain from any knowing disparagement or defamation of the Company or its officers, directors, employees, or agents, or tortious interference with the contracts and relationships of the Company and (ii) that he will respond to any inquiries from any third party that he "left to pursue other business interests, enjoyed the opportunity to contribute to the Company and wishes the Company the best of luck in its future endeavors." Except (X) when required to do so by a lawful order of a court of competent jurisdiction, any governmental authority or agency, or any recognized subpoena power or (Y) as necessary to prosecute its rights against the Employee under this Agreement, the Company agrees (i) to refrain from, and to cause any person acting on its behalf to refrain from any knowing disparagement or defamation of Employee, or tortious interference with the contracts and relationships of Employee and (ii) that it will respond to any inquiries from third parties regarding Employee's departure from the Company with a statement that "Employee has left the Company to pursue other business interests. The Company is grateful for his contributions to the Company and wishes him the best of luck in his future endeavors."

8. Breach of this Agreement. The Parties acknowledge that upon material breach of any provision of this Agreement by Employee of the Company, the Company or Employee, as the case may be, would sustain irreparable harm from such breach, and therefore, Employee and Company hereby mutually represent, warrant and covenant that they have not violated and will not violate any of the terms or provisions contained herein. Employee and the Company also mutually agree that in addition to any other remedies which theey may have for any material breach of this Agreement or otherwise, the Company or the Employee, as the ase may be, shall be entitled to obtain equitable relief including specific performance and injunctions restraining Employee or the Company, as the case may be, from committing or continuing any such violation of this Agreement.

9. No Admission. The parties acknowledge and agree that this Agreement does not constitute and should not be construed in any way as an admission by any other party of (a) any wrongdoing or liability whatsoever, (b) any violation of the Employee's or the Company's rights or those of any other person, or (c) any violation of any order, law, statute, duty or contract. The Company specifically disclaims any liability for any alleged wrongdoing or liability, for any alleged violation of Employee's rights or those of any other person, or for any alleged violation of any order, law, statute, duty, or contract and Employee specifically disclaims any liability for any alleged wrongdoing or liability, for any alleged violation of the Company's rights or those of any other person, or for any alleged violation of any order, law, statute, duty, or contract.

10. Authority. The Company represents and warrants that the undersigned has the authority to act on behalf of the Company and to bind the Company and all who may claim through it to the terms and conditions of this Agreement. Employee represents and warrants that he fully understands the provisions contained in this agreement and that he has the capacity to act on his own behalf and on behalf of all who might claim through him to bind them to the terms and conditions of this Agreement.

11. No Representations. Neither Party has relied upon any representations or statements made by the other Party hereto which are not specifically set forth in this Agreement.

12. Severability. In the event that any provision hereof becomes or is declared by a court or other tribunal of competent jurisdiction to be illegal, unenforceable or void, this Agreement shall continue in full force and effect without said provision.

13. Arbitration/Attorneys Fees. The Parties agree that Section 12 of the Employment Agreement shall govern any disputes regarding this Agreement.

14. Successors. This Agreement shall inure to the benefit of and be enforceable by Employee's heirs and beneficiaries. This Agreement shall inure to the benefit of and be binding upon the Company and its respective successors, purchasers and assigns.

15. Entire Agreement. This Agreement represents the entire agreement and understanding between the Company and Employee concerning Employee's separation from the Company, and shall supersede and replace any and all prior agreements and understandings concerning Employee's relationship with the Company and his compensation by the Company, including but not limited to the Employment Agreement (other than as set forth in this Agreement).

16. No Oral Modification. This Agreement may only be amended in writing signed by Employee and the Company.

17. Construction. Whenever used in this Agreement, the singular shall be construed to include the plural and vice versa, where applicable, and the use of the masculine, feminine or neuter gender shall include the other genders. The subject matter and language of this Agreement has been the subject of negotiations between the parties and their respective counsel, and this Agreement has been jointly prepared by their respective counsel. Accordingly, this Agreement shall not be construed against any party on the basis that this Agreement was drafted by such party or its counsel. Headings of section and subsections are for convenience of reference only, and shall not be construed as a part of this Agreement, or as limiting or defining the scope of any term or provision hereof.

18. Governing Law. This Agreement shall be governed by the laws of the State of New York, without regard to its conflicts of law provisions.

19. Counterparts. This Agreement may be executed in counterparts, and each counterpart shall have the same force and effect as an original and shall constitute an effective, binding agreement on the part of each of the undersigned. This Agreement may be executed via facsimile or e-mail and signatures delivered via facsimile or e-mail shall be effective for all purposes.

20. Voluntary Execution of Agreement . This Agreement is executed voluntarily and without any duress or undue influence on the part or behalf of the Parties hereto, with the full intent of releasing all claims. The Parties acknowledge that:

(a) they have read this Agreement;

(b) they have been represented in the preparation, negotiation, and execution of this Agreement by legal counsel of their own choice or that they have voluntarily declined to seek such counsel;

(c) they understand the terms and consequences of this Agreement and of the releases it contains; and

(d) they are fully aware of the legal and binding effect of this Agreement.

21. Execution and Revocation Rights.

(a) This Agreement is intended to satisfy the requirements of the OWPBA. The Employee further agrees that he is advised by this Agreement, as required by the OWPBA, that (i) this waiver and release does not apply to any rights and claims that may arise after the effective date of this Agreement, (ii) he has the right to consult with an attorney prior to signing this Agreement, (iii) he may have at least twenty one (21) days to consider this Agreement, (iv) he has seven (7) days following his execution of this Agreement to revoke this Agreement, (v) this Agreement shall not be effective until the revocation period has expired, therefore making the effective date the eighth (8th) day after this Agreement is executed by the Employee.

(b) By executing this Agreement, the Employee acknowledges that the Employee has been advised by a representative of the Company that he has twenty-one (21) days within which to consider this Agreement before signing the same and that the Employee has, in fact, been given at least twenty-one (21) days within which to consider this Agreement prior to signing this Agreement.

(a) Following his signing of the Agreement, Employee has the right to revoke the Agreement at any time within seven (7) calendar days of him signing it, not including the date of his signing (the "Revocation Period"). Notice of Revocation shall be given in writing and sent by overnight mail no later than the seventh (7th) day following the date Employee signs this Agreement. The Notice of Revocation shall be sent to the Board of Directors of the Company. If Employee does not revoke the Agreement, this Agreement shall be deemed to be effective and to be enforceable as of the last date set forth opposite any signature hereto. If Employee gives Notice of Revocation during the Revocation Period in the manner specified above, this Agreement shall become null and void and all rights and claims of the parties which would have existed, but for the execution of this Agreement shall be restored.

[Signatures Follow on Next Page]

IN WITNESS WHEREOF, the Parties have executed this Separation and Settlement Agreement on the respective dates set forth below.

ACTINIUM PHARMACEUTICALS, INC.	DRAGAN CICIC, An Individual
By: /s/ Sandesh Seth	/s/ Dragan Cicic
Its: Executive Chairman	
Date: May 12, 2017	Date: May 12, 2017

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002

I, Sandesh Seth, certify that:

1. I have reviewed this Form 10-Q of Actinium Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods present in this report;

4. I am responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13-a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principals;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financing reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involved management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 4, 2017

By: */s/ Sandesh Seth*
Sandesh Seth
Chairman & CEO
(Duly Authorized Officer and
Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL AND ACCOUNTING OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002

I, Steve O'Loughlin, certify that:

1. I have reviewed this Form 10-Q of Actinium Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods present in this report;

4. I am responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13-a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principals;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financing reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involved management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 4, 2017

By: */s/ Steve O'Loughlin*
Steve O'Loughlin
Vice President, Finance and
Corporate Development
(Duly Authorized Officer and Principal Financial
and Accounting Officer)

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Actinium Pharmaceuticals, Inc. (the "Company") on Form 10-Q for the period ended June 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Sandesh Seth, Chairman & CEO of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Quarterly Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: August 4, 2017

By: */s/ Sandesh Seth*
Sandesh Seth
Chairman & CEO
(Duly Authorized Officer and
Principal Executive Officer)

Exhibit 32.2

CERTIFICATION OF PRINCIPAL FINANCIAL AND ACCOUNTING OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Actinium Pharmaceuticals, Inc. (the "Company") on Form 10-Q for the period ended June 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Steve O'Loughlin, Vice President, Finance and Corporate Development of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Quarterly Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: August 4, 2017

By: */s/ Steve O'Loughlin*
Steve O'Loughlin
Vice President, Finance and
Corporate Development
(Duly Authorized Officer and Principal Financial and Accounting Officer)