

Actinium Pharmaceuticals, Inc.
501 Fifth Avenue, 3rd Floor
New York, NY 10017

August 22, 2013

VIA EDGAR

Evan S. Jacobson
Attorney-Advisor
Division of Corporation Finance
Securities and Exchange Commission
100 F Street N.E.
Washington, D.C. 20549

**Re: Actinium Pharmaceuticals, Inc. (Formerly Cactus Ventures, Inc.)
Registration Statement on Form S-1
Filed March 15, 2013
File No. 333-187313**

Dear Mr. Jacobson:

We are in receipt of your comment letter dated April 11, 2013 regarding the above referenced filing. As requested in your letter, we have provided responses to the questions raised by the staff. For your convenience, the matters are listed below, followed by Actinium Pharmaceuticals, Inc.'s (the "Company") responses:

General

1. Your filing states that you are incorporated in Nevada and discusses Nevada law. On January 29, 2013, you filed a Definitive Information Statement on Schedule 14C disclosing that you changed your state of incorporation to Delaware. Please revise or advise.

RESPONSE: On April 11, 2013, the change of domicile from the State of Nevada to the State of Delaware and the change of Cactus Ventures, Inc.'s name from Cactus Ventures, Inc. to Actinium Pharmaceuticals, Inc. became effective in accordance with Articles of Merger filed with the State of Nevada and a Certificate of Merger filed with the State of Delaware. We have made corresponding changes to the Form S-1/A.

2. We note that on December 28, 2012, you dismissed R.R. Hawkins & Associates International and hired GBH CPAs. Please revise to include the information regarding the changes in and disagreements with accountants on accounting and financial disclosure pursuant to Item 11 of Form S-1 and Item 304 of Regulation S-K. Please ensure that the Exhibit 16 letter provided by your prior accountants refers to the correct registrant. In this regard, we note that the Exhibit 16 letter included in the Form 8-K filed on January 2, 2013 refers to Denali Concrete Management.

RESPONSE: We have revised the Form S-1 to include that information regarding the change in and disagreements with accountants on accounting and financial disclosure pursuant to Item 11 of Form S-1 and Item 304 of Regulation S-K. We have also included in the Form S-1 as Exhibit 16 a revised Exhibit 16 that refers to the correct registrant.

3. Please provide us with copies of all written communications, as defined in Rule 405 under the Securities Act, that you, or anyone authorized to do so on your behalf, present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not they retain copies of the communications. Similarly, please provide us with any research reports about you that are published or distributed in reliance upon Section 2(a)(3) of the Securities Act of 1933 added by Section 105(a) of the JOBS Act by any broker or dealer that is participating or will participate in your offering.

RESPONSE: We have provided a copy of a Share Exchange Agreement by and among the Company, Actinium Pharmaceuticals, Inc., Diane Button (former control shareholder of Cactus Ventures, Inc.) and the Actinium stockholders to the selling stockholders listed in the registration statement. There have been no research reports prepared on the Company.

Prospectus Summary

Business Overview, page 4

4. Please disclose that since inception on June 13, 2000, you have not generated any revenues, and that as of December 31, 2012, you have incurred net losses of \$55,743,463. In addition, disclose your cash balance as of December 31, 2012 and, as disclosed on page 44, state that in 2013, you need up to \$20 million in cash to finance research and development and to cover your ongoing working capital needs. Clarify that your first product is not expected to be commercialized until at least 2016. See Item 503(a) of Regulation S-K.

RESPONSE: We have included these disclosures in the Business Overview section of the document.

Risk Factors, page 6

5. Include a risk factor, or risk factors, discussing the impact of Securities Act Rule 144(i), which will prohibit the use of the Rule 144 safe harbor until one year after you ceased to be a shell company, are an Exchange Act reporting company, are current in your periodic reports, and have filed Form 10 level disclosure for operating business activities. Address the potential effects on your ability to attract additional capital through unregistered offerings, and on the liquidity of your shares. See Item 503(c) of Regulation S-K.

RESPONSE: We have included a risk factor discussing the impact of Securities Act Rule 144(i), which will prohibit the use of the Rule 144 safe harbor until one year after we ceased to be a shell company and the potential effects on our ability to attract additional capital through unregistered offerings, and on the liquidity of our shares.

"if we fail to obtain the capital necessary to fund our operations..." page 6

6. Quantify your cash balance as of December 31, 2012, and the amount of money you need to finance research and development and to cover your ongoing working capital needs for the next twelve months. See Item 503(c) of Regulation S-K.

RESPONSE: We have added this disclosure to the document.

"Our radio-immunotherapy project candidates are in the early stages..." page 7

7. Here, and in the immediately following risk factor, please explain what you mean by IND and NDA.

RESPONSE: We have revised the risk factors to explain the meaning of "IND" and "NDA".

Risks Related to Ownership of Our Common Stock, page 15

8. The first three risk factors in this section do not appear applicable to this offering. Please revise.

RESPONSE: We have removed these three risk factors.

"The sale of securities by us in an equity or debt financing..." page 15

9. On page 44, you disclose that in 2013, you expect cash needs of up to \$20 million to continue your research and development efforts, that you have not completed your efforts to establish a stable recurring source of revenues sufficient to cover your operating costs for the next twelve months, and have financed your operations primarily through sales of stock and the issuance of convertible promissory notes. Please revise this risk factor and the immediately following risk factor to address these issues, the likelihood of future equity or debt financings, and the associated risks. See Item 503(c) of Regulation S-K.

RESPONSE: We have revised the disclosure in the two risk factors on page 15.

"If we fail to maintain an effective system of internal controls..." page 17

10. Please revise this risk factor disclosure to clearly indicate that at December 31, 2012, management concluded that your disclosure controls and procedures and your internal control over financial reporting were not effective due to several material weaknesses. In addition, please describe more fully the steps that you are currently taking to remediate the material weaknesses. Also, revise to disclose how long you estimate it will take to remediate such weaknesses and disclose any material costs associated with your remediation plan that you have incurred (or that you expect to incur).

RESPONSE: We have updated the disclosure of the risk factor on page 17.

Selling Stockholders, page 19

11. Please explain why the second paragraph of this section states that the tabular disclosure assumes a 100% share exchange by Actinium shareholders.

RESPONSE: On December 28, 2012, Cactus Ventures, Inc. entered into a transaction, pursuant to which Cactus acquired 100% of the issued and outstanding equity securities of Actinium Pharmaceuticals, Inc., in exchange for the issuance of approximately 99% of the issued and outstanding common stock, par value \$0.01 per share, of the Cactus. The share exchange closed on December 28, 2012. As a result of the share exchange, the former shareholders of Actinium became the controlling shareholders of Cactus. At the time of the filing of the Form 8-K on January 2, 2013, Cactus had not received all of the signature pages to the Share Exchange Agreement from the Actinium exchanging shareholders. We included the persons for whom we did not receive actual share exchange signature pages in the total issued and outstanding share count because the process of obtaining the remaining signature pages was simply to document the share exchange transaction that had already been approved by the Actinium shareholders in September 2012.

12. Please disclose the person or persons who have sole or shared voting and/or investment power over the securities owned by each legal entity. See Item 507 of Regulation S-K and, for guidance, refer to Questions 140.01 and 140.02 of the Division of Corporation Finance's Compliance and Disclosure Interpretations of Regulation S-K.

RESPONSE: We have revised the Selling Stockholder table to include the person or persons who have sole or shared voting and/or investment power over the securities owned by each legal entity.

13. Numerous footnotes contain disclaimers of beneficial ownership. To the extent that you retain these disclaimers, please provide us with a legal analysis supporting your belief that beneficial ownership disclaimers are proper outside of filings on Schedules 13D and 13G, and revise to disclose who has voting and/or dispositive power over the disclaimed shares. For guidance, refer to Section III.A.4 of SEC Release No. 33-5808. Alternatively, delete the disclaimers.

RESPONSE: We have deleted the disclaimers.

Description of Business, page 35

14. Please discuss your current financial condition, and the steps you plan to take in the short term and long term to continue to fund your business. For each step necessary to implement your business plan, please provide a timeline for completion and disclose the costs associated with completing each step and your anticipated funding source for each step. Additionally, explain how the substantial doubt regarding your ability to continue as a going concern impacts your business plan.

RESPONSE: We have added additional disclosure to the document to address these points.

15. Please include a materially complete description of all material agreements. For example, we note your discussion of several license and research and development agreements on pages F-18 through F-20.

RESPONSE: We have included a description of the material agreements related to our business in the document.

16. Please disclose an estimate of the amount spent on research and development activities during the last two fiscal years and include a materially complete description of these activities. See Item 101(h)(4)(x) of Regulation S-K.

RESPONSE: We have added this disclosure to the document.

Business Overview, page 35

17. Please clarify your statement that Memorial Sloan-Kettering Cancer Center is "a related institution."

RESPONSE: Through an indirect subsidiary, Actinium Holdings Ltd. (AHL), MSKCC has been a principal stockholder of the Company since April 2010.

Our Corporate History and Background

Acquisition of Actinium, page 35

18. Please explain why the Share Exchange was conducted in two phases and why you intend to "continue to exchange [your] shares of common stock for shares of Actinium held by the remaining Actinium Shareholders." Provide us with a legal analysis as to whether the Share Exchange has been completed and tell us whether you are attempting to register shares of common stock held by Actinium Shareholders that have not already been exchanged. For guidance, refer to Question 139.06 of the Division of Corporation Finance's Compliance and Disclosure Interpretations of Securities Act Sections.

RESPONSE: On December 28, 2012, Cactus Ventures, Inc. entered into a transaction, pursuant to which Cactus acquired 100% of the issued and outstanding equity securities of Actinium Pharmaceuticals, Inc., in exchange for the issuance of approximately 99% of the issued and outstanding common stock, par value \$0.01 per share, of the Cactus. The share exchange closed on December 28, 2012. As a result of the share exchange, the former shareholders of Actinium became the controlling shareholders of Cactus. The share exchange was approved by a majority of Actinium Corporation's stockholders in September 2012. Although the share exchange was approved by the Actinium Corporation shareholders (which includes over 200 shareholders), we only included those shareholders in the December 28, 2012 share exchange close that had actually delivered a signed share exchange agreement to the Company. We reported a second share exchange on March 7, 2013, and we closed on a third share exchange on August 22, 2013. The March and July share exchange agreements included those Actinium Corporation shareholders who had delivered signed share exchange agreements after December 28, 2012.

We are currently in process of collecting the remaining signatures of the exchanging Actinium Corporation shareholders. Since the share exchange was approved by the Actinium Corporation shareholders, we are registering the shares of common stock held by Actinium Corporation shareholders that have not provided a signed share exchange agreement. The process of collecting the remaining actual signature pages to the share exchange agreement and exchanging the corresponding Actinium Corporation shares for new Actinium shares has been and is being performed only to properly document what already has been approved by the shareholders in September 2012 and closed upon on December 28, 2012.

The table below sets forth the share exchange dates, the number of shares exchanged, and the percentage of Actinium Corporation shareholders that have exchanged their shares for the Company's shares:

	December 28, 2012 Share Exchange	March 11, 2013 Share Exchange	August 22, 2013 Share Exchange
No. of Actinium Corp. shares exchanged	12,939,986	22,055,225	24,052,705
Total percentage of Actinium Corp. shares exchanged	21%	55.5%	93.7%

Intellectual Property Portfolio, page 38

19. Please provide a more detailed description of the material aspects of your patents and patent applications. Ensure that you address their applicability to your fundamental business. See Item 101(h)(4)(vii) of Regulation S-K.

RESPONSE: We have revised this section of the document.

Market Price of and Dividends on Our Common Stock and Related Stockholder Matters

Registration Rights, page 40

20. Please disclose the number of shares entitled to registration rights and include a general discussion of the origin of the registration rights.

RESPONSE: We have updated the disclosure in this section.

Overview, page 41

21. Please balance your disclosure in this section by including an expanded discussion of the key challenges you are facing, such as funding issues. See Item 303(a) of Regulation S-K, and for guidance, refer to Section III.A of SEC Release No. 33-8350.

RESPONSE: We have added disclosure to this section that expands on the key challenges that we are facing, such as funding issues.

Liquidity and Capital Resources, page 44

22. You state on page 44 that if all of the securities offered hereunder are sold, the net proceeds from this offering will provide you with the capital needed for 2013. Please clarify that this is a resale offering and there is no guarantee that any of the warrants will ever be exercised. Discuss the extent that you will be able to implement your business plan and describe the individual stages of the plan that you will be able to complete if only 25%, 50%, 75%, or none of the warrants are exercised. Also disclose the minimum number of months that you will be able to conduct your planned operations using currently available capital resources, assuming the exercise of 25%, 50%, 75%, 100% or none of the warrants. Finally, discuss your alternative plans for funding, assuming none of the warrants are exercised. See Item 303(a) of Regulation S-K.

RESPONSE: We have revised the disclosure in this section of the document.

Directors and Executive Officers, page 47

23. Please disclose whether there are any arrangements or understanding between your directors and any other persons pursuant to which they were selected as a director. See Item 401(a) of Regulation S-K.

RESPONSE: We have updated the disclosure in the document.

24. For each director, on an individual basis, discuss the specific experience, qualifications, attributes or skills that led the board to conclude that such person should serve as a director. See Item 401(e)(1) of Regulation S-K and for guidance, refer to Question 116.05 of the Division of Corporation Finance's Compliance and Disclosure Interpretations of Regulation S-K.

RESPONSE: We have added "qualifications" disclosure to the document.

25. You disclose that Mr. Traversa, your chief executive officer and chief financial officer, also serves as the chief executive officer of Relmada Therapeutics Inc. Please disclose the minimum amount of time per week that Mr. Traversa devotes to your company. Also, address whether his outside employment creates a material risk of conflicts of interest and, if so, how such conflicts will be resolved.

RESPONSE: Mr. Traversa devotes a minimum of 40 hours per week to the Company. Relmada Therapeutics, Inc. is an unrelated company to us and specializes in pain management, which is unrelated to our business. We do not believe that Mr. Traversa's outside employment creates a material risk of conflicts of interest.

Corporate Governance Director

Independence, page 48

26. Please clarify in the opening paragraph of this section that you are not listed on the NASDAQ, so although you use its definition of independence, its independence rules are inapplicable to you.

RESPONSE: We have revised the disclosure in this section.

Executive Compensation

Summary Compensation Table, page 51

27. Please explain why you awarded Mr. Cacic options and how you determined the amounts awarded. See Item 402(o) of Regulation S-K.

RESPONSE: We have added disclosure to this section on how we determined the option wards granted to Dr. Cacic.

Director Compensation, page 51

28. Please provide director compensation disclosure in the tabular format set forth in Item 402(r) of Regulation S-K.

RESPONSE: A Director's Compensation table in the tabular format has been added to this section.

Security Ownership of Certain Beneficial Owners and Management, page 53

29. Your footnote disclosure suggests that you only included options and warrants in the table if they vested as of December 28, 2012. A person is deemed the beneficial owner of a security if that person has the right to acquire beneficial ownership of such security within 60 days, including, but not limited to, any right to acquire through the exercise of any option, warrant or right. See Exchange Act Rule 13d-3(d)(1)(i) and Instruction 2 to Item 403 of Regulation S-K. If the options or warrants are exercisable within 60 days, they should be included in the table. Please revise the table and footnotes accordingly.

RESPONSE: We have updated the beneficial ownership table and footnotes to include share ownership up to July 23, 2013 and any options and warrants, if any, exercisable by such holder within 60 days.

30. We note your disclosure in footnote 6 regarding the dissolution of Actinium Holdings by Bermuda authorities and its impact on beneficial and other ownership rights until the reinstatement of Actinium Holdings. Despite this issue, please disclose the person or persons who would otherwise have sole or shared voting and/or investment power over the securities beneficially owned by AHLB Holdings, LLC. See Instruction 2 to Item 403 of Regulation S-K.

RESPONSE: Actinium Holdings Ltd. ("AHL") entered into a Share Exchange Agreement with the Company and a Lock-up Agreement contemporaneously with the filing of the amended Form S-1 (and had been previously reinstated). The disclosure in the amended Form S-1 has been modified accordingly. We have also disclosed the persons that share voting and/or investment power of the securities held of record by AHL.

Certain Relationships and Related Transactions

Transactions With Related Persons, page 55

31. Please provide us with your analysis as to whether Memorial Sloan-Kettering Cancer Center and/or related entities constitute your promoters. See Rule 405 of Regulation C.

If necessary, provide the disclosure required by Item 404(c) of Regulation S-K. See Item 404(d)(2) of Regulation S-K.

RESPONSE: We do not believe that any of Memorial Sloan-Kettering Cancer Center, Inc. ("MSKCC") and its related entities, consisting, for purposes of this response, of Sloan-Kettering Cancer Institute, Inc., AHL and AHLB Holdings, LLC (such entities, together with MSKCC, the "MSKCC Parties") is a promoter of the registrant, Actinium Pharmaceuticals, Inc. (f/k/a Cactus Ventures, Inc.). The registrant was founded and organized in 1997, and the MSKCC Parties had no connection with the registrant until the share exchange in which the registrant was acquired by the stockholders of Actinium Corporation, f/k/a Actinium Pharmaceuticals, Inc. ("AC") and AC became a subsidiary of the registrant. With respect to AC, as a predecessor of the registrant, AC was incorporated in June 2000; however, the License and Development Agreement between AC (including an affiliated entity) and Sloan-Kettering Cancer Institute was not entered into until February 2002. None of the MSKCC Parties directly or indirectly acquired any equity in AC until March 2010, when shares of AC were indirectly donated to MSKCC.

In any case, we respectfully note that no disclosure is required with respect to the role of any promoter in the organization and founding of AC or the registrant, since, under Item 404(c)(1) of Regulation S-K, disclosure with respect to promoters is required only if the registrant has "had a promoter at any time within the past five fiscal years." We do not consider the share exchange to constitute a founding or organization of the registrant; however, even if one were to take a contrary position, the MSKCC Parties did not take any part in the negotiation of the share exchange or its terms and are receiving their shares solely in consideration for property (i.e., shares of AC) on terms identical to those of other stockholders of AC of the same classes, as determined pursuant to AC's governing documents and the Share Exchange Agreements between AC, the registrant and the stockholders of AC.

Because certain of the MSKCC Parties may be deemed to be acquiring control of the registrant in the share exchange and because the registrant was a shell company prior to the share exchange, we agree that, under Items 404(c)(2) and 404(d)(2) of Regulation S-K, the disclosure required by paragraphs (c)(1)(i) and (c)(1)(ii) of Item 404 is required. The disclosure in the amended Form S-1 under "Certain Relationships and Related Transactions" meets the requirements of those paragraphs.

32. In the first paragraph on page 2, please clarify what you mean by the "Closing Date."

RESPONSE: We have clarified that "Closing Date" means December 28, 2012 in the registration statement.

Description of Securities

Warrants, page 57

33. You do not appear to have described the material terms of the Stock Offering warrants, consulting firm warrants, and placement agent warrants. In addition, it is unclear whether you have filed the related agreements as exhibits. Please revise or advise.

RESPONSE: We have added a description of the material terms of the Stock Offering warrants, consulting firm warrants and placement agent warrants to the registration statement. We have also filed these warrants as exhibits to the Form S-1/A.

Disclosure of Commission Position on Indemnification of Securities Act Liabilities, page 61

34. This section appears inapplicable to this filing. See Item 510 of Regulation S-K. Please revise.

RESPONSE: We have removed this section from the registration statement.

Recent Sales of Unregistered Securities, page 64

35. For each unregistered offering, provide a more detailed discussion of the facts relied upon to make the exemption available. See Item 701(d) of Regulation S-K. Disclose the number of non-accredited investors.

RESPONSE: Please see that last paragraph of Item 15 regarding a detailed discussion of the facts relied upon to make the exemptions relied upon available. We have also disclosed that there were no non-accredited investors in any of the offerings.

Signatures, page 66

36. The registration statement has not been signed by your controller or principal accounting officer. See Instruction 1 to Signatures for Form S-1. Any person who occupies more than one of these specified positions must indicate each capacity in which they sign the registration statement. See Instruction 2 to Signatures for Form S-1. Please revise.

RESPONSE: Our registration statement has been filed by Sergio Traversa, our Interim Chief Financial Officer. We have indicated that Mr. Traversa is our Principal Financial Officer in the signature block of the registration statement.

37. Please file your transaction management agreement with Jamess Capital Group, LLC and your contract with Oak Ridge National Laboratory as exhibits, or explain to us why Item 601(b)(10) of Regulation S-K is inapplicable.

RESPONSE: Our agreement with Jamess Capital Group, LLC was terminated on March 31, 2013. We have included our contract with Oak Ridge National Laboratory as an exhibit to the registration statement.

The Company acknowledges that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Sincerely,

Actinium Pharmaceuticals, Inc.

By: /s/ Sergio Traversa

Sergio Traversa
Interim President, Interim Chief
Executive Officer, and Interim Chief
Financial Officer