

April 25, 2008

Mail Stop 6010

Robert P. Hebert
Chief Financial Officer
CPEX Pharmaceuticals, Inc.
2 Holland Way
Exeter, NH 03833

**Re: CPEX Pharmaceuticals, Inc.
Registration Statement on Form 10-12B/A, filed April 11, 2008
File No. 1-33895**

Dear Mr. Hebert:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your documents in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with supplemental information so we may better understand your disclosure. After reviewing this information, we may or may not raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

FORM 10-12B/A

EXHIBIT 99.1 INFORMATION STATEMENT

CPEX Cover Letter

1. We note that you state that the members of your management team have “more than 100 collective years of experience ... in the development of pharmaceutical products.” From your disclosures on pages 73 and 81 it appears that your only executive officers are Messrs. Sedor and Hebert. Please revise your statement or clarify who you have included in your management team.

Risk Factors, page 15

2. We note your response to prior comment 14. Please revise your disclosure to separate the risk relating to the expiration of the patents for your CPE-215 technology into a separate risk factor. Please place this as the first risk factor related to your intellectual property.

“Products using our technologies are in various stages of development...” page 17

3. We note your response to prior comment 16. Please either disclose all material proposed products currently in development with your technologies or provide us with a detailed analysis which supports your conclusion that the information constitutes nonpublic corporate information and the disclosure of such information would adversely affect your competitive position.

“If we are unable to meet our responsibilities under any of our agreements...” page 19

4. We note your response to prior comment 18. Please note that you should disclose a sufficient amount of information to enable the reader to assess the situation and effect to date and any anticipated future effect on your revenue. For example, we note that you state that if you do not maintain adequate patent protection your royalty rate will be significantly reduced. Please revise your disclosure to quantify the reduction in your royalty rate.

“We may be unable to make, on a timely or cost-effective basis, the changes necessary to operate as an independent company...” page 26

5. We note your disclosure on page 52 states, “Bentley will have the ability, upon notice, to unilaterally terminate the Transition Services Agreement, whereas we will require Bentley’s consent to terminate our obligation to provide services to Bentley.” Please revise this risk factor to clarify that Bentley will have the ability to unilaterally terminate this agreement, however, you will not have the ability to unilaterally terminate it.

Certain Material U.S. Federal Income Tax Consequences of the Distribution, page 33

6. We note your response to prior comment 27. Please revise to clarify that you are summarizing “all material” tax consequences, instead of only “certain material” tax consequences.

Business, page 57

Sources and Availability of Raw Materials, page 64

License Agreement with Auxilium A2, Inc., page 64

7. We note your response to prior comment 44. Please revise this section to describe all the material terms of this agreement. For example, you have not disclosed any payment provisions, including approximate royalties and the aggregate milestones. Please also disclose the payments made and royalties received to date under this agreement. In addition, disclose whether this agreement expires or whether the royalty rates will change when the patents expire. Please quantify any changes.

Development Agreements with Educational Institutions, page 64

8. We note your response to prior comment 32. Please revise your disclosures to quantify the expenses incurred to date under your agreements with Dartmouth College and the expenses incurred to date under your agreements with University of New Hampshire.

Development and Commercialization of Nasulin, page 65

9. We note that you provide citations to the results of your Nasulin trials in response to our prior comment 34. Please revise your disclosure in this section to summarize each of the trials, including the number of participants in each of the trials, the duration of the trials and the results and/or findings of each of the trials.

Intellectual Property, page 70

Asset Purchase Agreement with Yungtai Hsu, page 71

10. Please revise your disclosure to more fully describe (a) the patents and technology which were transferred under this agreement and (b) the amount of the royalty payments and when the company will be required to make such payments. In addition, disclose whether this agreement expires when the patents expire.

Assignment Agreement with MacroChem Corporation, page 71

11. Please revise your disclosure in this section to clarify the company's future plans with regard to these patents.

Management, page 71

Compensation Discussion and Analysis, page 77

Executive Officer Agreements, page 79

12. We note your response to prior comment 52. Please revise this section to disclose the material compensation terms for Messrs. Sedor and Hebert under the new employment agreements. For example, please disclose their base salary, bonus, automobile allowance, if any, and equity incentive awards.

Security Ownership of Certain Beneficial Owners and Management, page 86

13. Please revise footnotes 2 through 4 on page 87 to identify all of the beneficial owners of the shares held of record by Balyasny Asset Management LLC, Luther King Capital Management Corporation and Visium Asset Management L.P.

Exhibit 2.1

14. We note that you have not filed Exhibit A to Exhibit 2.1. Please revise to provide a list briefly identifying the contents of the omitted exhibit, together with an agreement to furnish supplementally a copy of any omitted exhibit or schedule to the Commission upon request. See Item 601(b)(2) of Regulation S-K.

Exhibits 10.4 through 10.7

15. We note that the exhibits in the below each refer to one or more exhibits, annexes or schedules which are attached to these agreements and which do not appear to have been provided.

Exhibit Number	Missing exhibit, annex or schedule
10.4	Various
10.5	Schedule C to the license agreement; Schedule C to the fourth amendment; Exhibit A to the fourth amendment
10.6	Exhibits A and B
10.7	Exhibits A and B

Please be aware that when you file an agreement pursuant to Item 601(b)(10) of Regulation S-K, unlike Item 601(b)(2), you are required to file the entire agreement, including all exhibits, schedules, appendices and any document which is incorporated in the agreement. Please provide a copy of the above exhibits with the full and complete agreement, including any exhibits, schedules and appendices which are included in such

agreement. Please note that if these agreements are otherwise filed as an exhibit to this registration statement you may insert a note in brackets on the page which the annex or schedule is to be located as to the exhibit number of the filed document. Also, confirm in your response letter that all agreements provided pursuant to Item 601(b)(10) are provided in their entirety.

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As appropriate, please amend your filings in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please file your cover letter on EDGAR under the form type label CORRESP. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

You may contact Sasha Parikh at (202) 551-3627 if you have questions regarding comments on the financial statements and related matters. Please contact Jennifer Riegel at (202) 551-3575 or me at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: Eileen T. Nugent
Paul Donnelly
Skadden, Arps, Slate Meagher & Flom LLP
Four Times Square
New York, NY 10036