

Via Facsimile and U.S. Mail
Mail Stop 6010

November 16, 2007

Arthur T. Sands, M.D., Ph.D.
President and Chief Executive Officer
Lexicon Pharmaceuticals, Inc.
8800 Technology Forest Place
The Woodlands, TX 77381

**Re: Lexicon Pharmaceuticals, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2006
Form 10-Q for the Quarterly Period Ended September 30, 2007
File No. 0-30111**

Dear Dr. Sands:

We have limited our review of your filing to those issues we have addressed in our comments. In our comments, we ask you to provide us with information to better understand your disclosure. Where a comment requests you to revise disclosure, the information you provide should show us what the revised disclosure will look like and identify the annual or quarterly filing, as applicable, in which you intend to first include it. If you do not believe that revised disclosure is necessary, explain the reason in your response. After reviewing the information provided, we may raise additional comments and/or request that you amend your filing.

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 any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the Fiscal Year Ended December 31, 2006

Notes to Consolidated Financial Statements
Note 2: Summary of Significant Accounting Policies
Revenue Recognition, page F-8

1. You indicate that you recognize non-refundable upfront fees under drug discovery alliances on a straight-line basis over the estimated period of service, generally the contractual research term. Please revise your disclosure to indicate how you consider the contractual option granted in some of your contracts to extend the

- research term and separately reference the authoritative literature you rely upon to support your accounting. In addition, please explain to us why it is appropriate to consider only the research term of your agreements when it appears you are obligated or may be obligated to participate in continuing development of compounds. In this regard for example, it appears from your disclosure in your collaborations footnote beginning on page F-17 that you are jointly responsible for development under your N.V. Organon agreement.
2. You disclose that you allocate revenue from multiple element contracts to each element based on the relative fair value of the elements determined using objective evidence. You also disclose that you recognize the revenue for an element upon completion when it is tied to a separate earnings process and on a straight-line basis over the life of the term of the agreement when it is not specifically tied to a separate earnings process. Please address the following comments:
- Please revise your policy disclosure to clarify how you assess deliverables under paragraph 9 of EITF 00-21. In this regard, please ensure that you address standalone value for your deliverables.
 - Please revise your collaborations disclosure in Note 13 to identify the deliverables under each agreement and clearly indicate whether you have separated these deliverables into separate units of account as required by paragraph 18 of EITF 00-21.

Form 10-Q for the Quarterly Period Ended September 30, 2007

Notes to Consolidated Financial Statements

Note 7: Arrangements with Symphony Icon, Inc., page 9

3. You disclose that you consolidate Symphony Icon because it is a variable interest entity and you are the primary beneficiary. Please address the following comments:
- Please revise your disclosure to clarify how Symphony Icon, Inc. is a variable interest entity and how you are the primary beneficiary when it appears that Symphony Icon Holdings LLC contributed all the working capital to Symphony Icon, Inc. Separately demonstrate to us why you consolidate Symphony Icon and reference for us the authoritative literature you rely upon to support your accounting.
 - Please explain to us how the separate presentation of short-term investments held by Symphony Icon on your balance sheet complies with consolidation accounting and reference for us the authoritative literature you rely upon to support your accounting.
 - Please revise your disclosure to explain how you valued your purchase option to acquire all the equity of Symphony Icon. In this regard, it appears that you may have valued this option by subtracting the \$15 million cash you received

from the \$23.6 million fair value of the 7,650,622 shares of your common stock issued to Symphony Icon Holdings LLC based on the closing price of your stock on the date of this transaction. If this is true, please explain why there is no apparent fair value for the option in excess of the value of the shares you issued.

- d. Please explain to us why it is appropriate to charge the \$8.6 million assigned to the purchase option and the \$2.2 million of Symphony Icon structuring and legal fees to noncontrolling interest on your balance sheet. Please reference for us the authoritative literature you rely upon to support your accounting.
- e. Please revise your disclosure to clarify whether you have charged any license fees or are recording any revenue from Symphony Icon.

Note 8: Agreements with Invus, L.P., page 10

4. You disclose that you issued 50,824,986 shares of common stock to Invus and permitted Invus to require that you conduct certain rights offerings in the future for \$205.4 million in gross proceeds. Please address the following comments:
 - a. Although you indicate that the warrants you issued to Invus automatically terminated upon the closing of the transaction, it appears from your proxy materials filed initially on June 18, 2007 that Invus exercised these warrants and that the shares are included in the 50.8 million shares identified above. Please revise your disclosure to clarify.
 - b. Please revise your disclosure to clarify your accounting for your rights offering grant to Invus. In addition, please reference for us the authoritative literature you rely upon to support your accounting. In your response, please explain to us how you evaluated the provision that permits Invus to set the rights offering price between \$4.50 and the then-current market price of your common stock. In this regard, please explain the applicability of paragraphs 19 to 24 of EITF 00-19 and, if applicable, how your accounting complies.

Please respond to these comments within 10 business days or tell us when you will provide us with a response. Please submit a letter that keys your responses to our comments and provides the requested information. Detailed letters greatly facilitate our review. Please furnish your letter to us via EDGAR under the form type label CORRESP.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In connection with responding to our comments, please provide, in your letter, a statement from the company acknowledging that:

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- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filing or in response to our comments on your filing.

If you have any questions, please contact Mark Brunhofer, Senior Staff Accountant, at (202) 551-3638. In this regard, do not hesitate to contact me, at (202) 551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief
Accountant