

Via Facsimile and U.S. Mail
Mail Stop 4720

January 25, 2010

Dr. Arthur T. Sands, M.D., Ph.D.
President and Chief Executive Officer
Lexicon Pharmaceuticals, Inc.
8800 Technology Forest Place
The Woodlands
San Diego, CA 92121

**Re: Lexicon Pharmaceuticals, Inc.
Form 10-K for the Year Ended December 31, 2008
Filed March 6, 2009
File No. 000-30111
DEF14A
Filed March 13, 2009
File No. 000-30111**

Dear Dr. Sands:

We have reviewed your filings and have the following remaining comment.

In our comment, we ask you to provide us with information to better understand your disclosure. Where it 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 comment or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

DEF14A
EXECUTIVE AND DIRECTOR COMPENSATION
Compensation Discussion and Analysis, page 24

1. We note your response to our prior comment 4 and your proposed additional disclosure regarding individual goals. You indicate that individual goals consist principally of the expected individual contributions of each executive officer towards the achievement of the year's corporate goals. To the extent such expected individual contributions are pre-determined and linked to corporate goals, please describe each goal and include an assessment of whether each executive met his or her expected contribution and how such achievement was used to determine the final amount of bonus allocated. If the individual contributions were not pre-determined, identify the achievements the Compensation Committee determined and disclose that the goals were not predetermined.

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Please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter that keys your response to our comment and provide any requested information. Detailed letters greatly facilitate our review. Please file your letter on 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 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 comment on your filing.

Please contact Nandini Acharya at (202) 551-3495 or me at (202) 551-3715 with any questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director