

Mail Stop 4720

September 21, 2009

Daniel L. Peters
President and Chief Executive Officer
Molecular Insight Pharmaceuticals, Inc.
160 Second Street
Cambridge, MA 02142

**Re: Molecular Insight Pharmaceuticals, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2008
File Number: 001-33284**

Dear Mr. Peters:

We have reviewed your response and have the following comments. Where the comments request 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.

Form 10-K

Business

Patents and Proprietary Rights, page 10

1. Please provide proposed disclosure to be included in your next Form 10-K which expands your discussion to identify which patents are related to which product families, the range of expiration dates of those patents, and the same details about your in-licensed patents.

Schedule 14A

Compensation Discussion and Analysis

Factors Considered to Determine Total Direct Compensation, page 20

2. Your Compensation Discussion and Analysis does not disclose or quantify each of the individual or corporate objectives set for use in determining your executive officers' bonus payments. Regardless of whether incentive bonuses were paid, you should disclose the goals that were set, and the extent of achievement of each of those goals. Please provide us with draft disclosure for your next proxy statement which provides the following:

- The performance objectives set by the compensation committee for 2009;
- Confirmation that you will discuss the achievement of the objectives; and
- A discussion of how the level of achievement will affect the actual bonuses to be paid.

To the extent that the objectives are quantified, the discussion in your proxy statement should also be quantified.

Summary Compensation Table, page 26

3. Please include disclosure for the past three years in this table.

* * *

Please respond to these comments within 10 business days or tell us when you will provide us with responses. Please furnish a letter that keys your response to our comments and provide the requested information. Detailed letters greatly facilitate our review. Please furnish 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 connection with responding to our comments, please provide, in your letter, a statement from the company acknowledging that:

- 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 comment on your filing.

Please contact Michael Rosenthal at (202) 551-3674 or me at (202) 551-3715 with any questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: Gabor Garai
Foley & Lardner LLP
111 Huntington Avenue
Boston, Massachusetts 02199
Phone: 617-342-4002
Fax: 617-342-4001