

Via Facsimile and U.S. Mail  
Mail Stop 6010

September 7, 2006

Mr. Thomas R. Staab, II  
Chief Financial Officer and Treasurer  
Inspire Pharmaceuticals, Inc.  
4222 Emperor Boulevard, Suite 200  
Durham, NC 27703

**Re: Form 10-K for the Fiscal Year Ended December 31, 2005  
Filed March 16, 2006  
Form 10-Q for the Fiscal Quarter Ended June 30, 2006  
Filed August 8, 2006  
File No. 001-31577**

Dear Mr. Hamm:

We have limited our review of your filings to those issues we have addressed in our comments. In our comments, we ask you to provide us with information so we may better understand your disclosure.

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-K for the Fiscal Year Ended December 31, 2005

Management's Discussion and Analysis of Financial Condition and Results of Operations

Critical Accounting Policies and Estimates

Revenue Recognition, page 48

1. You disclose both here and in your "Summary of Significant Accounting Policies" that you recognize co-promotion revenue based on net sales of Elestat and Restasis as reported to you by your collaborative partner, Allergan. We believe this disclosure could be improved to more fully explain the impact of these estimates on your financial statements. Please provide us with additional information, in a disclosure-type format, that describes what procedures you

undertake to mitigate the reporting risk associated with receiving the sales information from Allergan net of their various estimates, for example, product returns and rebates. That is, tell us how often you receive information from Allergan and whether and how often you record adjustments to actual net sales. Quantify any changes in estimate that you have recorded for the periods presented. In addition, disclose the effect that could result from using reasonably likely assumptions other than those used for each estimate as of December 31, 2005. For example, please disclose a range of reasonably likely amounts or another type of sensitivity analysis.

2. You also disclose both herein and in your “Summary of Significant Accounting Policies” that you estimate and reduce “gross” revenue for “incentive programs” that you manage. Please provide us with the information that follows, in a disclosure-type format, with respect to your incentive programs.
  - Describe the type of incentive programs that you manage as well as the related estimates that reduce your gross revenue. Clarify for us why you disclose that you record these estimates based on “gross” revenue, as it appears that you only receive net sales information from Allergan for both Restasis and Elestat.
  - Quantify the items that reduced the co-promotion revenue that you recorded for the periods presented pursuant to your incentive programs. Tell us how you estimate the proportion of sales that are subject to your incentive programs; that is, clarify whether you receive information from a third-party on which you base those estimates and how timely you reconcile estimated information to actual.
  - Outline the effect that could result from using other reasonably likely assumptions than those upon which you currently rely in estimating each item that reduces your co-promotion revenue pursuant to your incentive programs. For example, please disclose a range of reasonably likely amounts or another type of sensitivity analysis.
  - Finally, include information regarding the amount of and reason for period to period fluctuations within your statements of operations with respect to each incentive program item that reduces your co-promotion revenue for the periods presented. Please also address the effect that changes in your estimates with respect to each of these items had on your revenues and operations for the applicable periods.

Notes to Consolidated Financial Statements

Note 2. Summary of Significant Accounting Policies and Concentrations of Risk

Revenue Recognition, page F-10

3. You disclose that you recognize milestone revenue under your collaborative research and development agreements when you have performed services or have achieved a contractual development trigger. Please provide us with additional information, in a disclosure-type format, that clarifies your accounting policy with respect to development milestones specifying your basis for recognizing revenue when you have performed services versus when the milestone has been achieved. Further, regarding the latter, you state that the recognition period for your development milestone revenue begins at the achievement date and ends when you have finished your research and development commitment. In that respect, tell us whether you recognize a proportionate amount of development milestone revenue upon achievement that correlates to the work already performed under the underlying development arrangement.

Note 9. Collaboration Agreements, page F-21

4. Please provide us with the information that follows, in a disclosure-type format, with respect to your co-promotion agreements with Allergan for both Restasis and Elestat.
  - Please clarify your responsibilities under each agreement; that is, tell us whether you actually record any gross sales for either product, as it appears that you promote and sell each in the United States. Clarify whether you remit any payments to Allergan and, if so, tell us the nature of those payments. Additionally, tell us whether you maintain any product inventory or if the end-users of each product ultimately secure product orders from Allergan.
  - Based on the fact pattern surrounding your responsibilities under each agreement, tell us how you determined that it is appropriate to characterize the co-promotion revenue received from Allergan on a gross basis, that is, within revenue, rather than net of the related marketing and promotion expenses that you incur. Please cite the applicable authoritative literature under U.S. GAAP, for example, EITF No. 99-19, that supports your accounting treatment.

Form 10-Q for the Fiscal Quarter Ended June 30, 2006

Management's Discussion and Analysis of Financial Condition and Results of Operations

Overview, page 16

5. Please tell us why you disclose Allergan's net sales of Restasis for the three and six months ended June 30, 2006 but do not similarly disclose Allergan's sales of Elestat.

\* \* \* \*

Please provide us the information requested within 10 business days of the date of this letter or tell us when you will provide a response prior to the expiration of the 10-day period. Please furnish a letter with your response that keys your response to our comment. Detailed letters greatly facilitate our review. You should file the letter on EDGAR under the form type label CORRESP. Please understand that we may have additional comments after reviewing your response to our comment.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that they have provided 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.

Mr. Thomas R. Staab, II  
Inspire Pharmaceuticals, Inc.  
September 7, 2006  
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You may contact Amy Bruckner, Staff Accountant, at (202) 551-3657, or Lisa Vanjoske, Assistant Chief Accountant, at (202) 551-3614 if you have questions regarding comments on the financial statements and related matters. In this regard, please do not hesitate to contact me at (202) 551-3679.

Sincerely,

Jim B. Rosenberg  
Senior Assistant Chief Accountant