



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

January 3, 2014

Via E-mail

Pratik Shah, Ph.D.
President and Chief Executive Officer
Auspex Pharmaceuticals, Inc.
3366 N. Torrey Pines Court, Suite 225
San Diego, California 92037

**Re: Auspex Pharmaceuticals, Inc.
 Registration Statement on Form S-1
 Filed December 20, 2013
 File No. 333-193013**

Dear Dr. Shah:

We have reviewed your registration statement and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

We may not obtain orphan drug designation for SD-809 . . . , page 16

1. We note your response to our prior comment 9 that you believe that you could attempt to obtain orphan drug designation by providing a plausible hypothesis of its clinical superiority. Please clarify your plans in the event that you are unable to convince the FDA that SD-809 has a different API. If you plan to provide a plausible hypothesis, please expand your disclosure to describe the additional information you would provide to the FDA to support a plausible hypothesis of clinical superiority, and to explain if and when you would be required to demonstrate clinical superiority. Additionally, please describe any additional trials that you would need to conduct and the approximate cost and additional delays involved with running such trials.

Intellectual Property and Exclusivity, page 87

2. We note your response to our prior comment 17. Please expand your disclosure to provide the type of patent coverage (e.g., method of use, composition of matter) and the expiration date (or, if a patent application, the date filed).

Principal Stockholders, page 132

3. We note on page 132 that the percentage ownership information in the security ownership table excludes the share of Series E convertible preferred stock. The security ownership table should be updated to the most recent practicable date. Please revise the security ownership table to reflect the issuance and conversion of the Series E convertible preferred stock similar to other preferred stock for which common stock is issuable upon conversion. Additionally, please provide the date as of which this table applies.

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 the information the Securities Act of 1933 and all applicable Securities Act rules require. 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.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

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You may contact Scott Wuenschell at (202) 551-3467 or Mark Brunhofer at (202) 551-3638 if you have questions regarding comments on the financial statements and related matters. Please contact Matthew Jones at (202) 551-3786 or me at (202) 551-3715 with any other questions.

Sincerely,

/s/ Jeffrey P. Riedler

Jeffrey P. Riedler
Assistant Director

cc: Frederick Muto, Esq.
Cooley LLP
4401 Eastgate Mall
San Diego, California 92121