

Mail Stop 6010

December 22, 2008

Craig A. Dionne, PhD
Chief Executive Officer and President
9901 IH 10 West, Suite 800
San Antonio, TX 78230

**Re: GenSpera, Inc.
 Amendment No. 2 to Form S-1
 Filed December 11, 2008
 File No. 333-153829**

Dear Dr. Dionne:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

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.

Amendment No. 2 to Form S-1

Notes to Financial Statements for the Nine Month Periods Ended September 30, 2008 and 2007

Note 4 – Intellectual Property, page 60

1. Please refer to your response to comment 16. Please provide us with the following information:
 - Are the additional technology projects contingent on the successful completion of G-202?

- Please clarify whether the ‘additional technology’ to be developed constitutes currently identifiable future R&D projects and if the alternative future uses are reasonably expected to occur.
- Does the technology involved have the likely potential of being obsolete if the G-202 product fails or is terminated?
- Since the clinical trials to establish the safety and efficacy of the G-202 product have not been completed, please explain to us why you believe that you anticipate future economic benefits from the alternative future uses.
- Please explain what a patent application represents and tell us how much of the consideration paid was allocated to these items.

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As appropriate, please amend your filing in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed 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.

Notwithstanding our comments, in the event the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, 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 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.

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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 connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as a 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. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Vanessa Robertson at (202) 551-3649 or Joel Parker at (202) 551-3651 if you have questions regarding comments on the financial statements and related matters. Please contact Laura Crotty at (202) 551-3563, Suzanne Hayes at (202) 551-3675 or myself at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: Raul Silvestre
Law Offices of Raul Silvestre & Associates, APLC
31200 Via Colinas, Suite 200
Westlake Village, CA 91362