

Mail Stop 6010

December 9, 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. 1 to Form S-1
Filed November 24, 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. 1 to Form S-1

Prior Comments 27 and 28

1. We note that you have deleted the two risk factors addressed by our prior comments 27 and 28. We do not believe these risk factors qualify as “risks that could apply to any issuer” within the meaning of Item 503(c) of Regulation S-K, and therefore ask that you replace each risk factor and revise each according to our prior comments. Specifically, with respect to the risk factor beginning “The Company’s products may be expensive to manufacture...”, we ask that you provide further details as to why there are fewer potential manufacturers for the company’s proposed products as opposed to other drugs currently on the market,

why the company's proposed products require a greater level of needed expertise, and the "other general conditions affecting manufacturers of its expertise" and the "other general conditions affecting manufacturers of its products." With respect to the risk factor beginning "In order to secure market share and generate revenues..." we ask that you describe the "established treatment methods" and "more conventional drugs and therapies manufactured and marketed by major pharmaceutical companies" with which the company's proposed products will compete.

"We depend on Craig A. Dionne, PhD, our Chief Executive Officer..." page 8

2. We note your response to our prior comment 29. Please revise your risk factor discussion to specifically state that you currently do not have employment agreements with Dr. Dionne or Mr. Richardson.

Our Business, page 12

3. Our prior comment 50 asked that you expand your disclosure to include a more robust discussion of your business development. Please explain what role the co-inventors currently play in your company.

Masking/Targeting Agent, page 15

4. Our prior comment 54 asked that you revise the graphic titled "How to make our pro-drugs" to address three specific points, one of which being that some of the descriptions in the graphic are illegible due to font size and color. When viewing the graphic as if it contained four rows of text, the first two phrases contained in the bottom and fourth line of text, written in gray text, are still illegible. Please revise.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 20

Plan of Operation, page 20

5. Your current description of your relationship with Johns Hopkins University is incomplete. Please provide a complete description of any oral or written arrangements or agreements you have with referenced laboratories, Johns Hopkins University, your co-founders and any relevant academic channels, naming all parties involved. Your description should address what research is being conducted, by whom, where the funds are coming from, how the company benefits from any such arrangements and the respective parties' obligations. Describe your relationship with Drs. Isaacs and Denmeade. All material contracts, whether oral or written, should be included as exhibits to the registration

statement. You may provide summaries of oral contracts as exhibits to the registration statement if necessary.

6. Please expand your description of any oral or written understandings or arrangements you have with Johns Hopkins Oncology Center and Wisconsin Comprehensive Cancer Center. We note your references to these organizations on page 21.

Results of Operations, page 23

7. We note your response to our prior comment 79 relating to the assumption of patent fees and costs and related attorney fees. Please include the explanation provided in your supplemental response letter in the registration statement.
8. Please refer to your response to comment 80 and your revised disclosures. We note that you still have included explanations for changes in expense line items that include several factors without quantifying each factor. For example, in your explanation for the increase in general and administrative expenses for the nine months ended September 30, 2008, you disclose that the increase related to compensation, consulting, professional fees and other expenses but you do not quantify the amount of the change due to each of these factors. Please revise where applicable. In addition, please include an explanation for the increase in finance costs for the nine months ended September 30, 2008.

Liquidity and Capital Resources, page 25

9. Please refer to your response to comment 86 and your revised disclosures. Please revise your disclosure to include an explanation for the cash used in investing activities for the nine month period ended September 30, 2008. In addition, please include an explanation for the increase in accounts payable and accrued expenses for the nine month period ended September 30, 2008.

Certain Relationships and Related Transactions, page 29

10. We note your response to our prior comment 95 in which you indicate that you have removed the term “majority” when discussing Dr. Dionne throughout the registration statement. However, the term is still contained in numerous places in the Notes to the Financial Statements: Note 2 on page 48; Note 3 on page 49; Note 2 on page 57. Please remove all references to Dr. Dionne as the “majority stockholder.”

Selling Stockholders, page 32

11. In our prior comment 99 we asked that you reconcile various statements throughout the registration statement regarding the issuance of warrants to TR

Winston & Company (“Winston”). It does not appear from our review that such statements have been reconciled. Statements on pages 32 and 65 indicate that a warrant to purchase 278,400 common shares was issued to Winston, as well as warrants to purchase an additional 81,800 common shares in lieu of \$163,600 of its cash fee. Footnote 7 on page 35 states that the company issued 255,900 warrants to Winston. Please reconcile these statements.

Description of Securities, page 35

12. Please revise your disclosure to indicate why the company has not paid the penalties accrued as a result of missing the September 27, 2008 filing deadline.

Shares Eligible for Future Sale, page 37

13. We note your response to comment 102. However, your calculations include some errors. For example, if there are a total of 12,486,718 common shares outstanding of which 4,490,000 are being registered, a total of 7,996,718 will not be registered, rather than the 7,621,218 shares that you indicate. Please review and revise.

Notes to Financial Statements for the Years Ended December 31, 2007 and 2006

Note 3 – Convertible Notes Payable – Stockholder, page 49

14. Please refer to your response to comment 108. Please revise your disclosure to clarify that the notes are conventional convertible debt since they are convertible at a fixed conversion price.

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

Note 2 – Capital Stock and Stockholder’s Equity, page 57

15. Please refer to your response to comment 113. Please revise your disclosure regarding the warrants to clarify that they are exercisable into unregistered shares of common stock. Also, please clarify whether there are any events that would require the company to net cash settle the warrants.

Note 4 – Intellectual Property, page 60

16. Please refer to your response to comment 109. It is still not clear how you have determined that these patents will be used in future research and development projects other than projects you conducted during 2007 when the patent costs

were included as part of research and development expenses. Please discuss the specific intentions you have related to the alternative future uses.

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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.

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.

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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