

May 3, 2006

Mail Stop 6010

Samuel E. Lynch, D.M.D., D.M.Sc.
Chief Executive Officer
BioMimetic Therapeutics, Inc.
389-A Nichol Mill Lane
Franklin, Tennessee 37067

**Re: BioMimetic Therapeutics, Inc.
Amendment No. 2 to Registration Statement on Form S-1
Filed April 3, 2006
File No. 333-131718**

Dear Dr. Lynch:

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.

1. We note your reference your request for confidential treatment of your response letter under Rule 406. Please see Rule 406(a) regarding the proper rule governing such requests.
2. Please complete the remaining blanks, like those on page 103 and at the bottom of page 25.

Fee Table

3. Please revise the footnotes to clarify whether you are calculating the fee based on Rule 457(a) or 457(o).

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 37

Critical Accounting Policies and Estimates, page 39

Stock Based Compensation, page 41

4. We see that you present basic and diluted earnings per share as if you had not adopted SFAS 123(R). This measure appears to be a non-GAAP measure pursuant to the provisions of Regulation G and Item 10(e) of Regulation S-K since it excludes an amount that is included in the most directly comparable measure calculated and presented in accordance with GAAP. As such, please revise your filing to clearly identify the measure as non-GAAP and include all of the disclosures required by Item 10(e) of Regulation S-K, Regulation G, and Question 8 included in the Staff's Frequently Asked Questions Regarding the Use of Non-GAAP Measures. Refer to SAB Topic 14-G.

Results of Operations, page 44

Years ended December 31, 2005 and 2004

5. We refer you to prior comment 10 in our letter dated April 13, 2006. We do not see where you have quantified each of the factors listed as explanations for the significant increase in research and development and general and administrative expenses from 2004 to 2005. Please revise.

Business, page 51

6. Please expand your response to comment 12 to explain how you believe investors can evaluate your company and the impact of the agreements to which you are a party if you do not disclose what the milestones or other contingencies are and quantify the effect of those contingencies.

Intellectual Property, page 72

7. We note from the disclosure in response to prior comment 17 that several of your patents will be expiring soon. With a view toward disclosure, please explain to us the effect on your business of the expiration of these patents, including the percentage of your revenue derived from products including these patents.

Principal Stockholders, page 97

8. We note your disclosure in footnote 2 in response to comment 24. Please clarify which individuals beneficially own the shares.

Unaudited Condensed Consolidated Financial Statements, page F-2

Note 2. Summary of Significant Accounting Policies, page F-6

Stock Based Payments, page F-10

9. We see that you present basic and diluted earnings per share as if you had not adopted SFAS 123(R) in the footnotes to your financial statements. This measure appears to be a non-GAAP measure as defined by Regulation G and Item 10(e) of Regulation S-K since it excludes an amount that is included in the most directly comparable measure calculated and presented in accordance with GAAP. While you should disclose the effect of the adoption of SFAS 123(R) on basic and diluted earnings per share, the use of a non-GAAP measure is not appropriate. Pursuant to Item 10(e)(1)(ii), you may not present a non-GAAP financial measure in the footnotes to financial statements. Accordingly, please remove this measure from your financial statements and revise to disclose the impact of applying SFAS 123(R), as required by paragraph 84 of SFAS 123(R).
10. As a related matter, please note that you should continue to present the tabular information that was required by paragraph 45 of SFAS 123 for awards that were accounted for under the intrinsic value method of Opinion 25. Refer to paragraph 84 of SFAS 123(R).

Consolidated Financial Statements for the year ended December 31, 2005

Note 2. Summary of Significant Accounting Policies, page F-38

Stock Based Compensation, page F-44

11. We note your response to prior comment 29 in our letter dated April 13, 2006. You state that you have disclosed the weighted average fair value for all options outstanding for the years ended December 31, 2005, 2004 and 2003. We refer you to paragraph 47(b) of SFAS 123, which requires the disclosure of the weighted-average grant-date fair value of options granted *during the year*. Please revise.
12. As a related matter, please revise to clarify the time period for your weighted average exercise price and fair value disclosures in the table on page F-44. For example, if the amount presented is the weighted average exercise price of all outstanding options, please disclose that fact.

Note 12. Stockholder's Deficit, page F-58

13. We reference prior comment 32 in our letter dated April 13, 2006. We still do not see where you have provided all of the disclosures required by paragraphs 47 and 48 of SFAS 123. For example, the following information shall be disclosed for each year for which an income statement is provided:

- The number and weighted-average exercise prices of options for each of the following groups of options: (1) those outstanding at the beginning of the year, (2) those outstanding at the end of the year, (3) those exercisable at the end of the year, and those (4) granted, (5) exercised, (6) forfeited, or (7) expired during the year.
- The weighted-average grant-date fair value of options granted during the year. If the exercise prices of some options differ from the market price of the stock on the grant date, weighted-average exercise prices and weighted-average fair values of options shall be disclosed separately for options whose exercise price (1) equals, (2) exceeds, or (3) is less than the market price of the stock on the grant date.
- For options outstanding at the date of the latest statement of financial position presented, the range of exercise prices (as well as the weighted-average exercise price) and the weighted-average remaining contractual life shall be disclosed. If the range of exercise prices is wide (for example, the highest exercise price exceeds approximately 150 percent of the lowest exercise price), the exercise prices shall be segregated into ranges that are meaningful for assessing the number and timing of additional shares that may be issued and the cash that may be received as a result of option exercises. The following information shall be disclosed for each range: The number, weighted-average exercise price, and weighted-average remaining contractual life of options outstanding and the number and weighted-average exercise price of options currently exercisable.

Please tell us specifically where in your filing you have included each disclosure required by those paragraphs.

Note. 17. Subsequent Event, page F-65

14. We note that your directors have approved a 1.5 to 1 stock split that will take effect immediately prior to the completion of the initial public offering. Please revise to reflect the stock split retroactively throughout the financial statements and the rest of the document, including the capitalization and dilution tables, or tell us why retroactive presentation is not applicable. Please refer to SAB Topic 4.C.

Exhibit 5

15. Please file an opinion that covers all shares offered, including the over-allotment shares.
16. It is unclear why the opinion states that the shares “when authorized...will be duly authorized.” Are the shares not yet authorized? Why is it appropriate to offer shares that are not authorized? Given this statement, hasn’t counsel essentially assumed away its opinion regarding due authorization?
17. We note that the opinion is conditioned not only on the sale occurring in the manner described in the registration statement but also “in accordance with the resolutions adopted by the Board of Directors (or another properly authorized body) of the Company.” It is unclear why this additional condition is necessary or appropriate in the opinion. How and why will these resolutions differ from what is described in the registration statement?

As appropriate, please amend your registration statement 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 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 filing to be certain that the filing includes all information required under the Securities Act of 1933 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.

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 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.

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 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 Kristin Lochhead at (202) 551-3664 or in her absence, Kaitlin Tillan at (202) 551-3604 if you have questions regarding comments on the financial statements and related matters. Please contact Jay Mumford at (202) 551-3637 or me at (202) 551-3672 with any other questions.

Sincerely,

Russell Mancuso
Branch Chief

cc: Anna T. Pinedo
James R. Tanenbaum