

April 13, 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. 1 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. Please submit via Edgar your complete letter in response to our previous comments, including appendices.

Prospectus Summary, page 1

2. We note your response to our prior comment 3. We reissue the comment. Your disclosure in the first paragraph under "BioMimetic Therapeutics, Inc." on page 1 implies that you have approval for all bone regeneration uses. This disclosure seems to conflict with the disclosure on page 52. Please reconcile.
3. We note your response to our prior comment 4. The materials you provided do not identify Luitpold, and the material is from 2002. We reissue the comment. Please provide us objective support your statements about Luitpold being a "leader in the sales of oral surgical and periodontal bone grafting materials. . ."

4. We note your response to prior comment 5; however, that comment sought specific disclosure of your actual experience with failure to satisfy prior expectations. Therefore, we reissue the comment: When disclosing your current expectations in your prospectus, please provide equally prominent disclosure of failure to satisfy prior expectations. In an appropriate section of your document, explain the reasons for not satisfying those expectations and include appropriate risk factors. Likewise, appropriate sections of your document should include specific discussions of any failure to meet material milestones; we note the information in Exhibit C to your response letter.
5. We note your response to comment 8.
 - It is unclear how you addressed the first bullet point.
 - If you have not obtained the consent of the authors of the data, please tell us how you are assured that the data remains current and accurate.

Management's Discussion and Analysis of Financial Condition and Results of Operation, page 33

Critical Accounting Policies and Estimates, page 34

Stock-Based Compensation, page 36

6. We note the changes made to your document and your responses to prior comments 21 and 71 – 73 in our letter dated March 9, 2006. We see that you used an income approach to reassess the fair value of common stock for 2005 and the first quarter of 2006 and then allocated the value to common and preferred stock based on economic and control rights of the preferred stock. Please tell us and disclose the specific methodology used in the income approach and the basis for all significant assumptions and any discounts. For example, if you used the discounted cash flow method please disclose the significant assumptions, including how you estimated future cash flows and the discount rate. In addition, please describe how you used the economic and control rights of the preferred stock to allocate the value between common and preferred stock.
7. We also note that you applied a liquidity and additional discount to the midpoint of the preliminary estimated price range to determine the fair value of your common stock. Please clarify the basis for the additional discount for the liquidation preference and other economic and control rights associated with the preferred since it appears that the preliminary pricing range should have already accounted for the conversion of the preferred in connection with the IPO. In addition, please note that your disclosures should discuss the specific

methodology used to determine the fair value of your common stock and the basis for all significant assumptions and discounts. Please apply to your disclosures in MD&A and the footnotes to your financial statements.

8. We note that you issued Series C preferred stock to unrelated investors in April 2005 at \$11.81 per share. Please explain the basis for the significant difference between the preferred stock share price and the fair value assigned to your common stock during the second and third quarter of 2005.
9. Please also provide to us a detailed schedule of options granted during the period from January 1, 2006 through March 31, 2006, including the date of grant, optionee, number of options granted, exercise price and deemed fair value of the underlying shares of common stock. Please indicate the compensation expense expected to be recorded for each of these issuances.

Results of Operations, page 39

10. We see that you list multiple factors to explain the \$8.7 million and \$1.0 million increase in research and development expense and general and administrative expense, respectively, in 2005 compared to 2004. Please revise to quantify the effect on operating expense for each of the factors listed.

Liquidity and Capital Resources, page 40

11. Refer to prior comment 66 in our letter dated March 9, 2006. We do not see where you have revised your MD&A to describe the leasehold improvements made to the Franklin, Tennessee headquarters or to disclose whether you are required to or expect to incur additional significant costs for leasehold improvements/construction in process. Please revise accordingly.

Business, page 44

12. We note your response to comment 27; however, information required in a prospectus must be disclosed, even if confidential. Please tell us in detail how you determined whether undisclosed payments or obligations would materially affect your disclosed historical results.

Scientific Advisory Boards, page 61

13. We note your response to our prior comment 41. We reissue the first part of the comment. With a view toward clarified disclosure regarding the boards' roles, please tell us the number of times they have met as a board with you in the periods presented in the registration statement, the nature of those meetings, and the amount of compensation that they are paid.

Supply Agreements, page 63

14. We note your response to our prior comment 29 regarding your view that the Skeletal Kinetics agreement is not material. We also note the risk factor disclosure on page 10 regarding your reliance on your current supplier of β -TCP. Please explain how you believe an alternative to a sole supplier is not material in this context.

Manufacturing, page 63

15. We note your response to our prior comment 30. Please clarify what you mean by “the latter stages of product manufacturing” that you may bring in-house.
16. Please disclose the second bullet point of your response to comment 67.

Intellectual Property, page 64

17. Please disclose the dates that your owned and licensed patents expire.
18. We note your response to comment 34 and your additional disclosure. We reissue the comment. We note your disclosure, like on page 45, that others have developed products using the components of your products. Please revise your disclosure to clarify the scope of your rights to the intellectual property so that investors can understand how you do not infringe on the rights of others.

Post-Market Regulation, page 70

19. We note your revisions in response to comment 37; however, we believe that the forepart of your document should disclose with prominence equal to your disclosure of FDA approval that the FDA imposed “post-approval requirements” specific to your product.
20. With a view toward disclosure, please expand your response to prior comment 38 to clarify why the FDA required that you to develop a new test. Also, tell us the consequences if you are unable to establish and validate a new test.

Agreements with Directors and Officers, page 87

21. We note your response to our prior comment 46. Please provide the disclosure about Dr. Lynch’s ownership in Noblegene Development LLC in your response in this section of your prospectus.
22. We note your response to prior comment 48. With a view toward disclosure, please tell the amount of compensation Dr. Wisner-Lynch is receiving as your employee.

23. We note your response to our prior comment 50. Please explain to us why you believe that the agreements with Dr. Caplan, Case Western, and Dr. Wisner-Lynch are not material exhibits or file those agreements.

Principal Stockholders, page 90

24. Please identify the individuals who beneficially own the shares held by the Novo Nordisk Foundation.

Pricing, page 100

25. We note your disclosure in response to comment 56. With a view toward disclosure, please tell us with specificity the compensation paid to Pacific Growth Equities and whether you have any arrangements to receive services from any of the underwriters in the future.

Consolidated Financial Statements, page F-1

Report of Independent Registered Public Accounting Firm, page F-2

26. We note your “draft” report for the effect of any restatement of capital accounts described in Note 17. Prior to going effective the audit report should be signed and unrestricted. This comment also applies to the auditors’ consent.

Note 2. Summary of Significant Accounting Policies, page F-8

Receivables – trade, page F-8

27. We see that you have recorded \$380,911 for trade receivables from Luitpold. We also note that you have only recorded approximately \$175,000 in sublicense, sales and royalty income from Luitpold during 2005. Please revise your filing to clarify the nature of the other amounts due from Luitpold.

Revenue Recognition, page F-10

28. We refer to your disclosure on page 39 that you recognized \$0.06 million of revenue “based on estimates received from Luitpold for product sold.” Please tell us and revise your filing to disclose why you estimate revenue to be recorded and why this policy is appropriate under the applicable accounting guidance.

Stock Based Compensation, page F-12

29. Please reconcile the amounts disclosed in the table on page F-13 as the weighted average exercise price and weighted average fair value of options granted to the amounts included in Exhibit C of your response dated March 31, 2006.

Recent Accounting Pronouncements, page F-14

30. Refer to your response to prior comment 25 in our letter dated March 9, 2006. We see that you have removed the discussion of the adoption of SFAS 123R from the recent accounting pronouncements section of your MD&A and financial statement footnotes. Please tell us why you have removed this disclosure since you state on page 38 that you expect the adoption of the fair value method to have a significant impact on your results of operations. If you expect the impact of the adoption of this Standard will be material to your financial statements, appropriate disclosure under SAB Topic 11-M should be included in your financial statements.

Note 4. Agreements with Luitpold Pharmaceuticals, Inc., page F-15

31. We note your response to prior comment 65 in our letter dated March 9, 2006. We see that you changed the performance period for the recognition of revenue related to the \$10 million initial payment from Luitpold based on the timing of the FDA approval. You determined that a change in accounting estimate occurred and adjusted the performance period effective January 1, 2004 since the financial statements for 2004 had not yet been prepared. Please revise your disclosure to discuss the effect of the change in accounting estimate on net income and the related per share amounts of the current period, as required by paragraph 33 of APB 20.

Note 12. Stockholders' Deficit, page F-27

32. Refer to prior comment 75 in our letter dated March 9, 2006. We do not see where you have included all of the disclosure requirements of paragraphs 47 - 48 of SFAS 123. Specifically, the weighted average exercise price of options and the weighted average grant-date fair value of options granted during the year are not disclosed. In addition, it appears as though the range of exercise prices is wide and therefore the disclosures should be segregated into ranges that are meaningful. Please revise.

Undertakings

33. Please include the undertakings required by Regulation S-K Items 512(a)(5)(ii) and 512(a)(6). See Rule 430C(d) and Rule 424(b)(3).

Signatures

34. Please include the second paragraph of text required on the Signatures page.

Exhibits

35. Please file the option plan amendment mentioned on page 82.

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.

Samuel E. Lynch
BioMimetic Therapeutics, Inc.
April 13, 2006
Page 8

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