

May 10, 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. 5 to Registration Statement on Form S-1
Filed May 9, 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 expand your response to previous comment 1 to analyze your disclosure obligations under the “reasonably likely” standard. For guidance, please review Item 303 of Regulation S-K including clause (a)(3)(ii) and sections III.B.3. and IV of Release 33-8350 (December 19, 2003).

Intellectual Property, page 71

2. We reissue previous comment 2. It remains unclear how you have addressed your disclosure obligation regarding the scope and duration of all material patents, including all 13 patents mentioned in the third paragraph and all 11 patents mentioned in the fourth paragraph.

Samuel E. Lynch
BioMimetic Therapeutics, Inc.
May 10, 2006
Page 2

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.

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