

Mail Stop 6010

July 20, 2007

William M. Pinon  
President and Chief Executive Officer  
Bioheart, Inc.  
13794 NW 4th Street, Suite 212  
Sunrise, Florida 33325

**Re: Bioheart, Inc.  
Registration Statement on Form S-1, Amendment 2  
Filed July 12, 2007  
File No. 333-140672**

Dear Mr. Pinon:

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.

FORM S-1

Collaboration with Biosense Webster involving MyoStar . . . , page 89

1. We note the response and revisions pursuant to comment 1.
  - Since you state that the agreement may terminate after two years, please state the date when the agreement was entered into.

- We note you filed the agreement with Biosense Webster as an exhibit. However, Appendix A is not included on EDGAR. Please re-file the entire agreement, including all attachments, on EDGAR.

We depend on third parties to assist us in the conduct . . . , page 14

2. We note that your contract research organization for the MYOHEART Trial is going out of business. Please discuss this issue in a new, separate risk factor. Alternatively, confirm for us in your response letter, if true, that you do not anticipate any material difficulties in replacing this CRO.

Use of Proceeds, page 41

3. We note that pursuant to comment 4, you include language stating you do not currently have “agreements or understandings relating to the acquisition of technologies or businesses or the establishment of partnerships or collaborative opportunities with respect to which [you] anticipate using the proceeds of this offering.” However, this statement is preceded by “Except as otherwise described in this prospectus.” Please ensure your Use of Proceeds section describes the planned uses of the proceeds. If you currently have any agreements or understandings for which you are planning to use the proceeds from this offering, you should briefly describe them and state an approximate amount for each in the Use of Proceeds section.

Supply Agreements, page 91

4. We note the new discussion the agreement with BioLife Solutions, Inc. Please file this agreement as an exhibit. Also, please disclose the amount of the annual fee in this section of your filing.

Consolidated Financial Statements – Years Ended December 31, 2006, page F-1

Notes to Consolidated Financial Statements, page F-7

8. Stockholders' Equity, page F-16

Stock Options, page F-18

5. Since you have not disclosed an estimated offering price we are deferring a final evaluation of stock compensation and other costs recognized until the estimated offering price is specified and we may have further comment in this regard when the amendment containing that information is filed. In order for us to fully understand the equity fair market valuations reflected in your financial statements

based on the estimated common stock valuations disclosed on page 51, please provide us the following supplemental information:

- a. The date of the completion of transaction for the sale of 1,731,522 common shares at \$4.75 per share in fiscal year 2006 disclosed on page F-16;
- b. The identity of the recipients of that offering, indicating if they were a related party;
- c. How the pricing of that offering was factored into the fair value computation of \$3.50 determined at August 2006 and used for the granting of stock and option awards shown on page 121; and
- d. Explain the difference between the \$3.50 fair value used for the above options granted in August 2006 and the \$4.75 fair value used for the August 1, 2006 grant of options to members of the board of directors on page 124.

Exhibit 10.6

6. This exhibit refers to Exhibits A, B, C, D, and E, but these exhibits are not on EDGAR. Please re-file the entire agreement, including all attachments, on EDGAR. Also, confirm in your response letter that all agreements filed pursuant to Item 601(b)(10) of Regulation S-K are filed in their entirety.

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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 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 Jim Peklenk at (202) 551-3661 or Jim Atkinson at (202) 551-3674 if you have questions regarding comments on the financial statements and related

William M. Pinon  
Bioheart, Inc.  
July 20, 2007  
Page 4

matters. Please contact Greg Belliston at (202) 551-3861 or me at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey Riedler  
Assistant Director

cc: David E. Wells, Esq.  
Hunton & Williams LLP  
1111 Brickell Avenue, Suite 2500  
Miami, Florida 33131