

Mail Stop 6010

August 15, 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 3
Filed August 9, 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

Existing Capital Resources and Future Capital Requirements, page 56

1. Please file as exhibits the warrant issued to BlueCrest Capital Finance and the Loan and Security Agreement with BlueCrest.

Commitments and Contingencies, page 61

2. Please revise your discussion in footnote (1) to include the timing of the repayment and the amount of annual interest payments due on the debt discussed here. Refer to the Instruction 7 of Item 303(b) of Regulation S-K.

Supply Agreements, page 91

3. Refer to your response to comment four. Please note that a request for confidential treatment does not relieve your obligation to provide disclosures required by GAAP. As such, please revise your disclosure here and in the financial statements to include the amount of the payment or an explicit statement that this amount is not material.

Consolidated Interim Financial Statements, page F-24

Notes to Consolidated Interim Financial Statements, page F-28

6. Stock Options and Warrants, page F-32

4. 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.

* * *

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

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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