



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

February 7, 2012

Via Email

Mike Tomas
Chief Executive Officer
Bioheart, Inc.
13794 NW 4th Street, Suite 212
Sunrise, Florida 33325

**Re: Bioheart, Inc.
Registration Statement on Form S-1
Filed January 19, 2012
File No. 333-179096**

Dear Mr. Tomas:

We have reviewed your February 3, 2012 response to our January 30, 2012 comment letter and have the following additional comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. Where you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

General

1. Please incorporate all revisions reflected in the pages attached to your February 3, 2012 response letter in a pre-effective amendment, in addition to any changes made in response to the comments listed below.
2. We note the following statement in Section 10.01 of the Standby Equity Distribution Agreement: "Neither this Agreement nor any rights of the Company hereunder may be assigned to any other Person." Please amend your registration statement to clearly state that Greystone Capital Partners' obligations under the equity line agreement are not transferrable.

Dilution, page 22

3. We note the revised pages included with your February 3, 2012 response letter. Page 22

includes a reference to the sale of 40,000,000 shares rather 25,000,000 shares. Please revise.

Signatures, page 88

4. We note your response to our prior comment 5. Please also include the signature of the company's chief financial officer in addition to that of the principal accounting officer. See Instruction 1 to the Signatures section of Form S-1 for further information.

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 the information the Securities Act of 1933 and all applicable Securities Act rules require. 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 you request acceleration of the effective date of the pending registration statement please provide a written statement from the company 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.

Please refer to Rules 460 and 461 regarding requests for acceleration. 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. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

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You may contact Laura Crotty at (202) 551-3563 or me at (202) 551-3715 with any questions.

Sincerely,

/s/ Jeffrey P. Riedler

Jeffrey P. Riedler
Assistant Director

cc: Andrew Smith, Esq. (Sichenzia Ross Friedman Ference LLP)