



DIVISION OF  
CORPORATION FINANCE

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

June 18, 2012

Via E-mail

Mr. Keith R. Leonard, Jr.  
President and Chief Executive Officer  
KYTHERA Biopharmaceuticals, Inc.  
27200 West Agoura Road, Suite 200  
Calabasas, CA 91301

**Re: KYTHERA Biopharmaceuticals, Inc.  
Amendment No. 1 to Registration Statement on Form S-1/A  
Filed June 11, 2012  
File No. 333-181476**

Dear Mr. Leonard:

We have reviewed your amended registration statement and have the following 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. If 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.

Amendment No. 1 to Registration Statement on Form S-1/A

1. Please note that when you file a pre-effective amendment that includes your price range, it must be bona fide. We interpret this to mean that your range may not exceed \$2 if you price below \$10 and 20% if you price above \$10.
2. Please refer to the photographs on the following pages:
  - The first and third pages that follow immediately after the prospectus cover page;
  - Pages 96-98; and
  - Pages 109-111

Notwithstanding your statements accompanying some of the photographs that "individual results may vary," the photographs themselves strongly suggest that users of ATX-101 will see results similar to that of the featured patients. Because you have selected

photographs of a very small subset of the total patient population that took part in your clinical studies, potential investors may mistake these results as more broadly representative of the clinical subjects than is appropriate and may wrongly assume that product efficacy, and therefore regulatory approval, are assured. Accordingly, please remove these photographs from your registration statement.

3. Please also remove the photograph that appears on the page that follows page F-31, as its relevance is questionable and may create the impression that the woman shown in the photograph has been treated with ATX-101.
4. Please refer to the page that is two pages after the prospectus cover page, which states that you “are a clinical-stage biopharmaceutical company focused on the discovery, development and commercialization of novel prescription products for the aesthetic medicine market.” On this page, please include a legend that is prominent in both size and font that the statements made on this page do not refer to approved products and may not be indicative of all results. Please also state that the company is subject to numerous risks, including the risk that you may be unable to obtain regulatory approval for ATX-101. Please cross-reference the Risk Factor section in this legend.
5. On page 3 and on page 87, you state that you “believe ATX-101, if approved, has the potential to reach long-term annual sales of \$500 million in the United States.” Please briefly describe the basis for your belief.

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.

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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.

You may contact Vanessa Robertson at (202) 551-3649 or Joel Parker at (202) 551-3651 if you have questions regarding comments on the financial statements and related matters. Please contact Rose Zukin at (202) 551-3239, Daniel Greenspan at (202) 551-3623, or me at (202) 551-3710 with any other questions.

Sincerely,

/s/ Daniel Greenspan for

Jeffrey P. Riedler  
Assistant Director

cc: Brian Cuneo  
Latham & Watkins LLP  
140 Scott Drive  
Menlo Park, CA 94025