



DIVISION OF
CORPORATION FINANCE

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

Mail Stop 4720

November 3, 2010

Mr. Daniel Tassé
Chairman and Chief Executive Officer
Ikaria, Inc.
6 State Route 173
Clinton, New Jersey 08809

**Re: Ikaria, Inc.
Registration Statement on Form S-1
Amendment no. 4 filed October 22, 2010
Amendment no. 5 filed October 27, 2010
File No. 333-166792**

Dear Mr. Tassé:

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

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.

FORM S-1

Clinical Stage – Product Candidates
Clinical Development Program, page 110

We note your reference to the August 2010 FDA correspondence “with additional comments and recommendations relating to the trial design set forth in the revised protocol we submitted in June 2010.” You also refer to your September 2010 letter to the FDA and continued discussions with the FDA regarding its comments and recommendations. We also note your new disclosure concerning the October 2010 FDA correspondence which notified you “in writing that the letter we received from the FDA in August 2010 contained recommendations from the FDA and our special protocol assessment agreement is still in place.”

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Your discussion concerning your candidate's FDA status is potentially confusing since the reference to continuing discussions with the FDA regarding its comments and recommendations together with the FDA's October reminder concerning its August recommendations appears to contradict the statement that the FDA has advised you the special protocol assessment is still in place. In addition, it is unclear why the FDA would issue a letter in October 2010 informing you that the August 2010 correspondence contained recommendations unless the FDA determined you had not complied with its recommendations or conditions for a special protocol assessment. Please revise the discussion to clarify the status of the special protocol assessment, any remaining material issues with the FDA, and whether these issues need to be resolved prior to the commencement of your Phase 3 trial. In addition, please expand the discussion to briefly describe what steps, if any, you have initiated with respect to the commencement of the Phase 3 trial.

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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You may contact Franklin Wyman at (202) 551-3660 or Mary Mast at (202) 551-3613 if you have questions regarding the financial statements and related matters. Please contact John Krug, Senior Counsel, at (202) 551-3862, or me at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey Riedler
Assistant Director

cc: Steven D. Singer, Esq.
Lia Der Marderosian, Esq.
Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, Massachusetts 02109