

Mail Stop 6010

October 31, 2008

Michael T. Flavin, Ph.D.
Chairman and Chief Executive Officer
Advanced Life Sciences Holdings, Inc.
1440 Davey Road
Woodridge, Illinois 60517

**Re: Advanced Life Sciences Holdings, Inc.
 Registration Statement on Form S-3
 Filed on October 21, 2008
 File Number 333-154579**

Dear Dr. Flavin:

This is to advise you that we have limited our review of the above referenced registration statement to only the issues identified below.

Form S-3

1. It appears that you are attempting to rely on General Instruction I.B.6. of Form S-3 in registering the resale of the shares of common stock to be issued to YA Global Investments, L.P. in accordance with the Standby Equity Distribution Agreement. Please note that the date of the entry into the equity line agreement between the investor and the company is the date of sale of all the securities to be issued under the equity line for purposes of General Instruction I.B.6. of Form S-3. As a consequence, the amount of securities that may be registered on Form S-3 in reliance on General Instruction I.B.6 is determined based on the entire amount of securities issuable under the equity line agreement. Under our calculation, the aggregate of amount of securities issuable under the equity line agreement exceeds the amount of securities that the company is eligible to issue in reliance on General Instruction I.B.6 and therefore, the company may not use Form S-3 to register the indirect primary offering and resale of these securities.
2. Please note that YA Global Investments, L.P. must be named as an underwriter in the registration statement for the resale of the shares of common stock to be issued to YA Global Investments, L.P. in accordance with the Standby Equity Distribution Agreement.

Please furnish a response letter 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 urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed decision. 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 the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, 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 this action as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as a 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. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

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Please contact Sonia Barros at (202) 551-3655 with any questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: R. Cabell Morris, Jr., Esq.
Winston & Strawn LLP
35 West Wacker Drive
Chicago, Illinois 60601