

Mail Stop 4720

March 23, 2010

Via Facsimile and U.S. Mail

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-1
Filed March 10, 2010
File No. 333-165388**

Dear Dr. Flavin:

This is to advise you that we have limited our review of the above information statement to the issues identified below. We will make no further review of this filing.

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. After reviewing this information, we may or may not raise additional comments.

General

1. Please confirm that you will amend your registration statement to disclose the number of shares of common stock and the number of warrants that will comprise each unit.

* * *

As appropriate, please revise your information statement in response to these comments. You may wish to provide us with marked copies of the revised document to expedite our review. Please furnish a response letter that keys your responses to our comments. Detailed cover letters greatly facilitate our review. Please file your cover letter on EDGAR under the form type label CORRESP. Please understand that we may have additional comments after reviewing your amendment and response to our comment.

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. 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.

In connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that

- the company is responsible for the adequacy and accuracy of the disclosure in the filings;
- staff comments or changes to disclosure in response to staff comments in the filings reviewed by the staff do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments 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 our review of your filing or in response to our comments on your filing.

Please contact Scot Foley at (202) 551-3383 or me at (202) 551-3715 with any questions.

Sincerely,

Jeffrey Riedler
Assistant Director

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