



DIVISION OF
CORPORATION FINANCE

Mail Stop 6010

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

April 3, 2007

John S. Kovach
Chairman and Chief Executive Officer
Lixte Biotechnology Holdings, Inc.
248 Route 25A, No. 2
East Setauket, NY 11733

Re: Lixte Biotechnology Holdings, Inc.
Amendment No. 3 to Form SB-2
Filed March 13, 2007
File No. 333-137208

Dear Mr. Kovach:

We have reviewed your filing and have the following comments. 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. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

1. Please ensure that your document is updated throughout and internally consistent. For example, we note your disclosure on page 31 regarding the January 5, 2007 agreement with the University of Regensburg. However, on page 39, you disclose that the agreement is under negotiation.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 24

2. It appears that you are subject to penalties under the registration rights agreement if the registration statement is not declared effective by a specified date. With a view towards disclosure, please quantify the penalty and tell us how it affects the proceeds from the transaction, and your liquidity. File any related waivers.

Going Concern, page 30

3. The amount of net proceeds from the second closing of your private placement completed on July 27, 2006 (\$411,302) as indicated here and on page 6 of "Risk Factors" does not reconcile to the amount disclosed in Notes 2 and 3 on pages F-9 and F-13, respectively (\$446,433). Please make all appropriate revisions.

Principal Commitments, page 31

4. We see you indicate herein that, "Pursuant to the CRADA, Lixte agreed to provide total payments of \$400,000 over the term of the CRADA, of which \$200,000 had been paid at December 31, 2006 *and \$200,000 is due and payable in April 2007.*" Please tell us whether the referenced \$200,000 represents a liability that needs to be reflected in your most recent balance sheet. Revise the filing as necessary based on our concern or tell us why no revisions are necessary.

Intellectual Property, page 34

5. We reissue prior comment 4 which sought disclosure regarding your agreement to obtain exclusive commercial rights to the inventions covered by the patent applications. In response 19 in your letter dated December 1, 2006, you stated that the agreement would be executed in December 2006. Your current disclosure implies that the agreement is not yet executed. Therefore, we reissue comment 19 in our letter dated October 4, 2006 which sought that you disclose when the negotiations regarding the agreement began, the status of the negotiations, the principal hurdles that remain before an agreement can be reached, and the scope of your rights to the intellectual property if no agreement can be reached.

Government Regulation, page 39

6. From your current disclosure in response to prior comment 5, it appears that FDA regulation extends only through the "4 to 9 month" period of a phase I trial. If this is not correct, we reissue comment 5.

Scientific Advisory Committee, page 42

7. We reissue prior comment 6. From the table of contents of your prospectus, this disclosure continues to appear in the "Management" portion of your document and you discuss compensation of the committee as part of your executive compensation disclosure. Also, the advisory committee disclosure is surrounded by management disclosure, with the biographies of your board preceding your disclosure regarding the advisory committee, and audit committee and executive compensation disclosure following.

Rule 144, page 46

8. We note your reference to the weekly trading volume. Please revise your disclosure to be consistent with question and answer 113.02 in the April 2, 2007 interpretations regarding rule 144 available on our web site at <http://www.sec.gov/divisions/corpfin/guidance/rule144interp.htm>.

As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment 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.

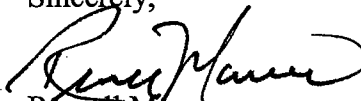
We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Act of 1933 and that they have provided all information investors require for an informed investment decision. Since 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.

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. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact David Burton at (202) 551-3626 or Jay Webb at (202) 551-3603 if you have questions regarding comments on the financial statements and related matters. Please contact Eduardo Aleman at (202) 551-3646 or me at (202) 551-3617 with any other questions.

Sincerely,


Russell Mancuso
Branch Chief

cc(via facsimile): David Ficksman – Troy & Gould, P.C.