Lixte Biotechnology Holdings, Inc.
248 Route 25A, No. 2
East Setauket, New York 11733

October 8, 2013

VIA EDGAR AND FACSIMILE

Scot J. Foley
U.S. Securities and Exchange Commission
Division of Corporate Finance
100 F Street NE
Washington, DC 20549

Re: **Lixte Biotechnology Holdings, Inc.**
Annual Report on Form 10-K for the Fiscal Year Ended December 31, 2012
Filed March 15, 2013
File No. 000-51476

Dear Mr. Foley:

This is in response to your letter to the Company of September 13, 2013.

We have reproduced below in bold face the text of your comments, followed by our responses. The numbered paragraphs below correspond to the numbered paragraphs in your letter.

Item 1, Business
Company Overview, page 4

1. Please disclose the material terms of your collaboration agreement with the National Cancer Institute. Your description should include, as may be applicable:

- **Nature of the collaboration;**
- **Material payment provisions including initial, annual, milestone or royalty provisions;**
- **Other material rights and obligations of both parties; and**
- **Duration, term and termination provisions.**

Please also file the collaboration agreement as an exhibit to your next quarterly report on Form 10-Q and incorporate the exhibit by reference to your next Form 10-K. If you believe that this agreement is not required to be filed pursuant to Item 601(b)(10) of Regulation S-K, please provide us with an analysis supporting this conclusion.

COMPANY RESPONSE:

The Company will modify the disclosure in its filings regarding the NExT program to make it clear that there was no binding agreement, payment requirements or other material obligations between the parties. Accordingly, no exhibit is required to be filed pursuant to Item 601(b)(10) or any other exhibit item. The proposed disclosure is as follows:

On September 17, 2010, the National Cancer Institute (NCI) Experimental Therapeutics (NExT) Program Senior Advisory Committee (SAC) approved a collaboration by the NCI with the Company for clinical evaluation of LB-100, one of the Company's drug compounds. This collaboration is a milestone-based approach in which NCI will first confirm studies of the LB-100 compound in an animal model of glioblastoma multiforme, the most common form of brain tumor of adults, and conduct an initial exploratory toxicology study in an animal model. At milestone intervals, the SAC will re-evaluate project progress before considering assignment of additional support and resources to this project. As noted below, the NExT group advised the Company on several aspects of the process of pre-clinical characterization of LB-100 needed for submission of an IND and carried out an initial toxicological study of LB-100 in rats. This study was used to guide the subsequent formal toxicology studies based on good laboratory practice (GLP) completed in rats and dogs by the Company with a contract research organization. The Company subsequently conducted its own GLP toxicity studies and submitted an IND for a clinical trial of LB-100, which acknowledged the early assistance of the NExT program in planning the design of animal studies.

The NExT program of the NCI is a unique partnership with the NCI to facilitate oncology drug discovery and development. The program is not a grant or a contract, but provides access to the NCI's drug discovery and preclinical development resources, including expert advice concerning the various requirements for bringing a new compound to initial clinical trial. Participation in the NExT program is via a competitive application. The Company was admitted to the program in September 2010. The Company received advice as to how to proceed with pre-clinical development of its lead compound LB-100 and the NCI performed one rodent toxicology study with LB-100. The Company was not responsible for any costs or payments, and neither party obtained or incurred any material rights or obligations. As is standard for the NExT program, there was no specific agreement, other than to limit support to pre-clinical development pending validation of anti-tumor activity in a specific tumor model. Activity deemed less than sufficient to warrant extension of NExTsupport toward clinical development led to termination of the Company's participation in the program on July 21, 2011. The Company subsequently carried out the pre-clinical studies for and obtained an IND from the FDA to study LB-100 in a Phase I clinical trial.

Intellectual Property, page 5

2. Please expand this disclosure to list each of your material patents and indicate the product candidates to which they relate and the indications they are intended to treat, the jurisdictions in which the patent applications were filed, their expiration dates, and the type of patent protection, e.g. composition of matter, use or process.

COMPANY RESPONSE:

The Company will expand its disclosures in its filings regarding its patents as follows:

The Company's products will derive directly from its intellectual property, including the property covered by its patents. These patents now cover sole rights to the composition and synthesis of the LB-100 and LB-200 series of drugs. Joint patent applications with the NIH have been filed for the treatment of glioblastoma multiforme, medulloblastoma, and neuroblastoma. The Company has also filed claims for the use of certain homologs of both series of drugs for the potential treatment of neurodegenerative diseases such as Alzheimer's Disease and Parkinson's Disease, Amyotrophic Lateral Sclerosis (ALS, or Lou Gehrig's Disease), stroke, and traumatic brain injury and of homologs of the LB-200 series for treatment of serious systemic fungal infections and for the treatment of common fungal infections of the skin and nails. Other claims cover biomarkers uniquely associated with specific types of cancer that may provide the bases for assays suitable for cancer detection and patents for development of a tool for screening new compounds for anti-cancer activity.

Patents for composition of matter and for several uses of both the LB-100 series (oxabicycloheptanes and –heptenes) and the LB-200 series (histone deacetylase inhibitors; HDACi) have been filed. Patents for the LB-100 series and the LB-200 series have been filed in the U.S. and widely internationally (PCT). International filings are currently all pending.

Issued patents are:

LB-100 Series Compounds
Oxabicycloheptanes and Oxabicycloheptenes, Their Preparation and Use

Patent	Priority Date	Type	Expiration Date
US 7,998,957	Feb 6, 2008	Composition and Use in Cancer Treatment	2/20/2030
US 8,227,473	Aug 1, 2009	Composition and Use in Cancer Treatment	2/20/2030
US 8,426,444 Div	Feb 6, 2008	Composition and Use in Cancer Treatment	2/6/2028

LB-200 Series Compounds
HDAC Inhibitors

US 8,143,445	Oct 1, 2008	Composition and Use in Cancer Treatment	8/23/2029
US 8,455,688 Divisional	Oct 1, 2008	Composition and Use in Cancer Treatment	10/1/2028

LB-100 and LB-200 Series Compounds
Neuroprotective Agents for the Prevention and Treatment of Neurodegenerative Diseases

US 8,058,268	Aug 1, 2009	Use in Treatment of Multiple CNS Diseases	12/31/2029
US 8,329,719 Divisional	Aug 1, 2009	Use in Treatment of Multiple CNS Diseases	7/29/2029

This will acknowledge that the Company is responsible for the adequacy and accuracy of the disclosure in the filing; staff comments or changes to disclosure in response to staff comments do not foreclose the Securities and Exchange 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.

Very truly yours,

Lixte Biotechnology Holdings, Inc.

By: /s/ John Kovach
Name: John Kovach
Title: President