



DIVISION OF
CORPORATION FINANCE

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

November 16, 2012

Via Email

Mr. Richard Brajer
Chief Executive Officer
LipoScience, Inc.
2500 Sumner Boulevard
Raleigh, NC 27616

**Re: LipoScience, Inc.
Amendment to Registration Statement on Form S-1
Filed October 23, 2012
File No. 333-175102**

Dear Mr. Brajer:

We have reviewed your registration statement and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

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.

General

1. We note revised disclosure indicating that you received FDA approval for Vantera in August and that you plan to begin making it commercially available in 2012. Please revise to further clarify the significant actions that need to be taken prior to commercialization. It is unclear, for example, if you have been marketing Vantera since August.
2. Also, where you state in the summary that Vantera was cleared “recently” or in August, please revise to also briefly explain the limitations on the clearance given the outstanding 510(k) proposal as well as the inability of third-party laboratories to directly receive the “second-page results” or non-cleared portions of your tests.

3. Please supplementally provide us with copies of all written communications, as defined in Rule 405 under the Securities Act, that you, or anyone authorized to do so on your behalf, present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not they retain copies of the communications. Similarly, please supplementally provide us with any research reports about you that are published or distributed in reliance upon Section 2(a)(3) of the Securities Act of 1933 added by Section 105(a) of the Jumpstart Our Business Startups Act by any broker or dealer that is participating or will participate in your offering.
4. We note the materials provided in response to prior comment 1 from our letter dated May 23, 2012 and your existing disclosure on page 1 that a 2008 joint consensus statement by the American Diabetes Association “recognized that direct LDL particle measurement by NMR may be a more accurate way to capture the risk posed by LDL than is traditional LDL-C measurement.” The 2008 statement appears to suggest that “there is a need for more independent data confirming the accuracy of the method and whether its CVD predictive power is consistent across various ethnicities, ages, and conditions that affect lipid metabolism.” (See page 1516). Please advise us of the meaning of this qualification and, if necessary, ensure that your existing statements about the report are appropriately balanced.

Management’s Discussion and Analysis of Financial Condition and Results of Operations, page 46

Overview

5. We note the recent FDA clearance of your Vantera system and plan to selectively place the system on-sight at clinical labs and hospitals. Please revise here, under Liquidity and Capital Resources and elsewhere as appropriate to address your plans in greater detail. It is unclear, for example,
 - whether you anticipate maintaining ownership of these systems and what impact that may have on your liquidity, capital resources, and maintenance expenses;
 - whether tests on these systems will be priced on a wholesale model versus a direct model; and,
 - whether you anticipate any sales substitution during the initial rollout period.

Critical Accounting Policies and Significant Judgments and Estimates, page 60

Stock-Based Compensation Expense, page 61

Determination of the Fair Value of Common Stock on Grant Dates, page 63

Common Stock Valuation Methodologies, page 64

Contemporaneous Valuation as of March 31, 2012, page 77

6. We note the substantial reduction in the per share value under the sale scenario as of March 31, 2012 (\$1.98 per share) and June 30, 2012 (\$2.29 per share) compared to the sale scenario as of December 31, 2011 (\$4.46 per share). Please revise to clearly describe the changes in assumptions and/or intervening events that occurred under the sale scenario between these valuation dates that caused the substantial reduction in the estimated per share value of common stock as of March 31, 2012 and June 30, 2012 compared to the value as of December 31, 2011.

Index to Financial Statements, page F-1

7. Please update your financial statements, as applicable, pursuant to Rule 3-12 of Regulation S-X.

Notes to Financial Statements, page F-7

Description of Business and Significant Accounting Policies, page F-7

Immaterial Correction of an Error, page F-8

8. We note that in the second quarter of 2012 you corrected an immaterial error in the amount of \$0.3 million to increase depreciation expense and accumulated depreciation; and that the adjustments should have been recognized during fiscal years 2008, 2009, 2010 and 2011 in the amounts of \$25,000, \$90,000, \$90,000 and \$90,000, respectively. Please supplementally provide us your qualitative and quantitative analysis to support your conclusion that these errors were not material. At a minimum, please include a discussion of the effect of the errors on your income (loss) from operations, net income (loss) and net income (loss) per share for each fiscal year.

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.

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You may contact Steve Lo at (202) 551-3394 or John Archfield at (202) 551-3315 if you have questions regarding comments on the financial statements and related matters. Please contact Jay Williamson at (202) 551-3393 or Jim Lopez at (202) 551-3536 with any other questions.

Sincerely,

/s/ James Lopez (for)

John Reynolds
Assistant Director

Cc: Brent Siler
Cooley LLP