



DIVISION OF
CORPORATION FINANCE

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

August 15, 2011

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 August 1, 2011
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 your response to comment four of our letter dated July 20, 2011. Please advise us of the extent to which the studies, including the study by Brunzell et al., are publicly available. Also with a view to clarifying disclosure in the last paragraph on page three, page 81 and where appropriate, advise us of the nature and extent of the role played by you and your consultants in conducting the studies. In this regard, we note the disclosure on page 81 that your founder "was an author of" several of the studies.
2. We note your response to comment five of our letter dated July 20, 2011. To more clearly place the graphic in context, please increase the font of the text after the asterisk, expand it to indicate the information provided in your response and briefly explain the anticipated timeframe for seeking and obtaining FDA clearance.

Prospectus Summary, page 1

3. We note your response to prior comment nine from our letter dated July 20, 2011 and the statements that “some” or “certain” measures have been submitted to the FDA, some measures have been cleared, “other measures” have not been submitted and “some of the other measures” are intended to be submitted within the next 12 months. Please revise to clarify the services for which you have and do not have clearance. Consider using a chart or other disclosure to summarize the information. Your revised disclosure should more clearly identify material risks associated with potential failure to obtain or maintain clearance for the different services you provide and intend to provide.
4. Also, with a view to clarifying disclosure, advise us if you could continue to “report the results” of the LipoProfile test as “FDA cleared” if you fail to receive clearance of Vantera.
5. We note your response to prior comment 50 as it relates to the preferred stock and warrants. Please advise us of the exhibits, agreements or provisions that contain or will contain the conversion and other terms of the warrants once the preferred stock are converted in connection with the offering. We may have further comment.

Management’s Discussion and Analysis, page 44

Critical Accounting Policies and Significant Judgments and Estimates, page 57

Revenue Recognition, page 58

6. We note your discussion of the final settlement adjustments in response to comment 48 of our letter dated July 20, 2011, and that historically such adjustments have not been material. Please revise your revenue recognition disclosure to further describe the final settlement adjustments and state that historically such adjustments have not been material.

Stock-Based Compensation Expense, page 58

7. We note that your weighted enterprise values of \$71.7 million, \$114.0 million and \$110.8 million as of October 31, 2008 (page 62), September 30, 2009 (page 63), December 31, 2009 (page 65), respectively, were greater than all individual enterprise values derived under each valuation methodology used for the continued operations scenario as of each date. Please further revise to describe why the weighted enterprise value as of these dates was greater than the individual enterprise values derived under each valuation methodology.

8. It appears that you assumed a discount rate of either 25% or 26% under the DCF methodology, IPO scenarios and sale scenarios for all valuations between October 31, 2008 and April 30, 2011 (page 61-71), and that the discount rate was based on your estimated weighted average cost of capital (page 62). Please further revise to describe how you determined the discount rate, and why a discount rate of 25% or 26% was used for all valuations between October 31, 2008 and April 30, 2011.

Retrospective Valuation as of September 30, 2009, page 63

9. We note in your response to our comment 26 of our letter dated July 20, 2011 that had the higher September 30, 2009 value been used in connection with the October 2009 stock option exchange, the stock-based compensation expense for the year ended December 31, 2009 would have increased by approximately \$250,000. We further note your revised disclosure on page 64 that had you used the higher \$2.27 value of your common stock per share as of September 30, 2009 the effect would not have been material and, therefore, no adjustment to your financial statements was necessary. Please provide us with your qualitative and quantitative analysis to support your conclusion that the effect of using the higher September 30, 2009 value for the two option grants of 88,200 total shares and the stock option repricing would not have been material given your net income of \$257,843 and net (loss) attributable to common stockholders of \$(782,157) for the year ended December 31, 2009.

Contemporaneous Valuation as of April 30, 2011, page 69

10. We note that on April 8, 2011 you granted options to purchase 437,100 shares with an exercise price of \$3.34 per share based on the November 30, 2010 contemporaneous valuation, and that you also estimated the grant date fair value of common stock to be \$3.34 per share (page 61). We further note that the value of your common stock increased to \$4.77 per share based on your April 30, 2011 contemporaneous valuation (page 71). Given the significant per share increase in your common stock from November 30, 2010 to April 30, 2011, please tell us the grant date fair value that you calculated for the April 8, 2011 options and the grant date fair value that would have resulted from using a reassessed value as of April 8, 2011. Also provide us with your qualitative and quantitative analysis to support your conclusion that the effect of using a reassessed value would not have been material to your operating results for the three and six months ended June 30, 2011.

Redeemable Convertible Preferred Stock Warrants, page 71

11. We note your disclosure of the preferred stock fair value in response to comment 22 of our letter dated July 20, 2011. Please further revise to also provide disclosure of the fair value as of the June 30, 2010, December 31, 2010 and April 30, 2011 valuation dates.

Index to Financial Statements, page F-1

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

Notes to Financial Statements, page F-7

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

Fair Value Measurement, page F-9

13. We note that you do not include debt in your fair value measurements disclosure on page F-9 and F-10. Please confirm to us that you will include fair value measurements disclosure for your debt in the footnotes your updated June 30, 2011 financial statements.

Concentration of Credit Risk and Other Risks, page F-14

14. We note in your response to comment 29 of our letter dated July 20, 2011 that customer 2 accounted for a single digit percentage of your revenues for the three months ended March 31, 2010 and the year ended December 31, 2010, rather than zero percent. Please revise to clearly distinguish the periods in which your revenues and accounts receivable were less than 10% from the periods in which they were zero percent.

12. Income Taxes, page F-33

15. We note in your response to comment 56 and 57 of our letter dated July 20, 2011 that you calculated a gross unrecognized tax benefit of \$327,500 as of December 31, 2010 related to tax positions taken on previously filed income tax returns. We further note that you did not record an unrecognized tax benefit liability for this amount, but instead you reduced your deferred tax assets by \$327,500 and reduced your valuation allowance against the deferred tax assets by the same amount. It appears to us that you have combined your liability for unrecognized tax benefits with deferred taxes. Please confirm our understanding and, if so, further explain to us why you have combined these two items and tell us how you considered ASC 740-10-45-11 in your conclusion to combine.

17. Subsequent Events (unaudited), page F-38

16. We note in your response to the comment 58 of our letter dated July 20, 2011 that you believe the Company is an "SEC filer" and, therefore, it is not required to include the requested information in the subsequent events footnote. Please further explain to us why you believe the Company is an SEC filer or, revise to disclose the date through which you have evaluated subsequent events and whether that date is either the date the financial statements were issued or available to be issued. In this regard, it appears that

you are currently a private company that is filing its previously completed financial statements in an initial registration statement on Form S-1.

Exhibits

17. We note your response to prior comment 60 and request additional information and further analysis. Please further advise us why you believe the agreements with Laboratory Corporation of America Holdings and Health Diagnostics Laboratory are substantially similar to the agreements with your other clinical diagnostic laboratory customers and reconcile your comment letter response to your page 12 risk factor. In this regard, we note the reference on page 85 to the “defined and differentiated national marketing campaign” with LabCorp. Alternatively, please file these agreements.

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.

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