

October 9, 2014

VIA EDGAR & OVERNIGHT MAIL

Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549

Attention: Russell Mancuso, Branch Chief

Re: MELA Sciences, Inc.
Amendment No. 1 to Registration Statement on Form S-3
Filed September 22, 2014
File No. 333-198249

Ladies and Gentlemen:

We are submitting this letter on behalf of MELA Sciences, Inc. (the “**Company**”) in response to comments from the staff (the “**Staff**”) of the Securities and Exchange Commission (the “**Commission**”) received by letter dated October 6, 2014 (the “**Comment Letter**”) from Russell Mancuso, Branch Chief, relating to the above-referenced registration statement on Form S-3 of the Company, filed with the Commission on August 19, 2014 (the “**Registration Statement**”), as amended on September 22, 2014. In conjunction with this letter, the Company is making amendments to the Registration Statement and is filing an amended registration statement on Form S-3 (the “**Amended Registration Statement**”) with the Commission.

For convenient reference, we have set forth below in italics each of the Staff’s comments set forth in the Comment Letter and have keyed the Company’s responses to the numbering of the comments and the headings used in the Comment Letter. All of the responses are based on information provided to Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. by representatives of the Company. Where appropriate, the Company has responded to the Staff’s comments by making changes to the disclosure in the Amended Registration Statement. Page numbers referred to in the responses reference the applicable pages of the Amended Registration Statement. All capitalized terms have the meaning set forth in the Company’s response letter dated September 22, 2014 (the “**Response Letter**”).

We are providing by overnight delivery to Mr. Mancuso of the Staff five courtesy copies of this letter and copies of the Amended Registration Statement that have been marked to show changes from the Registration Statement.

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Selling Stockholders, page 19

1. **Comment:** *Regarding your response to prior comment 1:*

- *Please disclose in your prospectus, if true, that each selling stockholder that is an affiliate of a broker-dealer purchased the offered securities in the ordinary course of business and, at the time of the purchase of the securities to be resold, the seller had no agreements or understandings, directly or indirectly, with any person to distribute the securities.*
- *Please reconcile your statement on page 5 of your response letter that no shares registered for sale in your April registration statement have been sold with your disclosure in the Selling Stockholders table that Broadfin beneficially owns no shares other than those offered by the current registration statement, either before or after this offering.*
- *We note the statement on page 10 of your response letter that the selling stockholders' representations excluded "sales registered under the Securities Act." Do you mean that, at the time of purchase, the selling stockholders could have intended to publicly sell or distribute the securities when the shares were registered for sale under the Securities Act? If so, please clarify why this does not affect your analysis of whether this transaction is appropriately characterized as a transaction that is eligible to be made on a shelf basis under Rule 415(a)(1)(i).*
- *Please tell us about any selling stockholder's ability to have designated a member of your board of directors in the past three years, how that ability affects your analysis presented in response to prior comment 1, and how you have addressed the related disclosure requirement in Regulation S-K Item 507.*

Response: In response to the Commission's comment:

- With respect to the first bullet point, the Company has revised the disclosure contained on pages 21 and 22 of the Amended Registration Statement to include the requested disclosure where applicable.
- With respect to the second bullet point, the Company advises the Commission that, based on information provided to it by Broadfin, the statement contained on page 5 of the Response Letter is correct and that none of the shares registered for sale in the April Registration Statement have been sold by Broadfin. All shares of Series A Preferred Stock, including those shares issued to Broadfin, were redeemed by the Company on the Closing Date of the Series B Private Placement Transaction, prior to any sales of Series A Preferred Stock by any holder, and as such no shares of Series A Preferred Stock are currently outstanding. The Company filed a post-effective amendment to the April Registration Statement on September 22, 2014, which the Commission declared effective on September 24, 2014, that de-registers the shares of Common Stock underlying the Series A Preferred Stock that were previously registered by the April Registration Statement. Further, none of the Series A Warrants held by Broadfin have been exercised and/or sold, and thus remain outstanding. Accordingly, the Company advises the Commission that it has revised pages 19 and 20 of the Amended Registration Statement to reflect the beneficial ownership by Broadfin of the Series A Warrants and the underlying February Warrant Shares.

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- With respect to the third bullet point, we wish to clarify the response set forth on page 10 of the Response Letter, as it pertains to the selling stockholders' representations as to their intentions regarding the registered securities, as follows.

The Company received the following representation from each Investor in the Securities Purchase Agreement for the Series B Private Placement Transaction (emphasis added):

“Such Purchaser understands that the Securities are “restricted securities” and have not been registered under the Securities Act or any applicable state securities law and is acquiring the Securities as principal for its own account and not with a view to or for distributing or reselling such Securities or any part thereof in violation of the Securities Act or any applicable state securities law, **has no present intention of distributing any of such Securities in violation of the Securities Act or any applicable state securities law and has no direct or indirect arrangement or understandings with any other persons to distribute or regarding the distribution of such Securities in violation of the Securities Act or any applicable state securities law** (this representation and warranty not limiting such Purchaser's right to sell the Securities pursuant to the Registration Statement or otherwise in compliance with applicable federal and state securities laws).”

The Company respectfully advises the Commission that, based on this representation, it is its understanding and belief that the Investors had no intention, at the time of entry into the Securities Purchase Agreement, to publicly sell or distribute the securities purchased thereunder (the “**Securities**”) at any pre-determined point in time, whether upon registration of such Securities pursuant to the Securities Act or otherwise. The Company believes that the parenthetical phrase contained in the representation above, regarding the Investors' rights to sell the Securities pursuant to the Registration Statement or otherwise, merely acknowledges the fact that the Company and the Investors had, as is routine in transactions of this kind, negotiated a Registration Rights Agreement pursuant to which the Company agreed to use its reasonable best efforts to have the Securities registered so that the Investors could thereafter resell them (at a future, unspecified point in time) without the need to comply with Rule 144. Further, the Company believes that the parenthetical phrase should be read to acknowledge that the existence of the possibility of such sales at a future, unspecified point in time, pursuant to the Registration Statement or otherwise, is not inconsistent with the notion that the Investors genuinely had no present intention to sell the Securities at the time the Securities Purchase Agreement was entered into.

- With respect to the fourth bullet point, the Company advises the Commission that following the issuance of the Series A Preferred Stock, Broadfin held a right to designate one member of the Company's board of directors for so long as Broadfin retained 30% of its investment in the Series A Preferred Stock (or the shares of Common Stock underlying the Series A Preferred Stock) or held any warrants. On March 31, 2014, Broadfin and the Company agreed to terminate this right, and the Company filed a Current Report on Form 8-K reporting the same. Broadfin did not exercise the designation right prior to its termination. In accordance with Item 507 of Regulation S-K, the Company has revised page 22 of the Amended Registration Statement to include disclosure regarding this matter.

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We hope that the above responses and the related revisions reflected in the Amended Registration Statement will be acceptable to the Staff. Please do not hesitate to call me or Garrett M. Winslow of this firm at (617) 542-6000 with any comments or questions regarding the Amended Registration Statement and this letter. We thank you for your time and attention.

Sincerely,

/s/ Megan N. Gates

Megan N. Gates

cc: Securities and Exchange Commission
Jay Mumford, Esq.

MELA Sciences, Inc.

Ms. Rose Crane, Chief Executive Officer

Mr. Robert W. Cook, Chief Financial Officer

Ellenoff, Grossman & Schole, LLP

Robert F. Charron, Esq.

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

Garrett M. Winslow, Esq.