

January 31, 2011

CERTAIN PORTIONS OF THIS LETTER AND ITS APPENDICES HAVE BEEN OMITTED AND FILED SEPARATELY WITH THE COMMISSION. CONFIDENTIAL TREATMENT HAS BEEN REQUESTED WITH RESPECT TO THE OMITTED PORTIONS. OMITTED INFORMATION HAS BEEN REPLACED IN THIS LETTER WITH A PLACEHOLDER IDENTIFIED BY THE MARK “[***]”.

Via EDGAR and Overnight Delivery

Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549-1004

Attention: Russell Mancuso, Branch Chief
Joseph McCann, Division of Corporation Finance
Mary Beth Breslin, Senior Attorney
Brian Cascio, Accounting Branch Chief
Martin James, Senior Assistant Chief Accountant
Jeanne Bennett, Division of Corporation Finance

**Re: Fluidigm Corporation
Registration Statement on Form S-1
Amended January 7, 2011, January 18, 2011 and January 28, 2011
File No. 333-170965**

Ladies and Gentlemen:

On behalf of Fluidigm Corporation (“Fluidigm” or the “Company”), we submit this letter in response to comments from the staff (the “Staff”) of the Securities and Exchange Commission (“SEC” or the “Commission”) received by teleconference on January 28, 2011, relating to Fluidigm’s Registration Statement on Form S-1 (File No. 333-170965) (the “Registration Statement”).

Because of the commercially sensitive nature of information contained herein, this submission is accompanied by a request for confidential treatment for selected portions of this letter and the supplemental materials. The Company is requesting confidential treatment for selected portions of this letter and the supplemental materials, including in connection with the Freedom of Information Act, and has filed a separate letter with the Office of Freedom of Information and Privacy Act Operations in connection with that request, pursuant to Rule 83 of the Commission’s Rules on Information and Requests, 17 C.F.R. § 200.83. For the Staff’s reference, we have enclosed a copy of the Company’s letter to the Office of Freedom of Information and Privacy Act Operations as well as a copy of this correspondence, marked to show the portions redacted from the version filed via EDGAR and for which the Company is requesting confidential treatment.

In this letter, we have attempted to summarize the verbal comments from the Staff in italicized, bold type and have followed each comment with Fluidigm's response. Except as otherwise specifically indicated, page references herein correspond to the page of the prospectus included in the Registration Statement.

1. *Please further explain the reason you continued to use significant discounts for options granted in January 2011 after the registration statement was filed and after you received an estimated price range from your underwriters.*

As indicated on page 44 of the prospectus, the board's determination of fair value for the Company's common stock on each grant date is based on its review and analysis of many factors, including but not limited to, ongoing developments in the Company's business, the status of ongoing efforts towards achieving a liquidity event, be it an IPO or a sale of the Company, sales of its preferred stock to outside investors in arms-length transactions, the rights, preferences and privileges of its convertible preferred stock relative to those of its common stock, the Company's capital resources and financial condition, its stage of development, the likelihood of achieving a liquidity event (such as an initial public offering or sale of the Company), and contemporaneous valuations by an unrelated third party. The board's determination of fair value for the options granted in January 2011 of \$4.84 (pre-split) was based in large part on the board's review and analysis of the following information:

- Possible Sale of the Company. [***] As discussed below, the board's determination of the fair value of the common stock was based on a probability weighted average of the value of the common stock in an IPO scenario and in a sale scenario. Because the value of the common stock is so much lower in a sale scenario, this averaging resulted in a fair value that is less than the estimated offering range for an IPO.
- Prospects for an Initial Public Offering. The board considered the status of the Company's efforts to complete an initial public offering, including steps completed to date and steps remaining. The board considered the risks and uncertainties remaining in the IPO process and the prospect of the Company's offering being significantly delayed or cancelled if the Company were required to add audited financial statements for the year ended December 31, 2010 to its offering materials (due to the additional time required to complete such audit and possible changes in market conditions). Perhaps more than most privately held companies and boards of directors, Fluidigm and its board are well aware of the risk and uncertainties associated with the IPO process and fully appreciate the numerous assumptions, qualifications and risks that are associated with relying solely on price range estimates provided by underwriters. In 2008, the Company and its board gained extensive experience with the risks and uncertainties of the IPO process. Despite its best efforts over an extended period of time, the Company was unable to complete its proposed initial public offering at that time and never realized any of the price range or valuation estimates provided by its underwriters. Public market volatility as recent as January 28, 2011 serves as a reminder of the risks and uncertainties associated with the offering process and the fact that any estimated price range provided by the underwriters is simply one of many possible valuation outcomes for the Company and its stock.
- Valuation Range provided by Underwriters. As indicated in the Company's prior response, on January 5, 2011, the Company received an estimated price range from its underwriters of \$6.75 to \$8.75 (pre-split). This estimated range was received a day after the board approved most of the January 2011 option grants. On January 4, 2011, the board did not have any

indication or preview as to what the estimated price range would be. Furthermore, even when the Company received the estimated range on January 5, 2011, the underwriters informed the Company that the estimated range was being provided for SEC discussion purposes only and that an actual price range for the offering would not be available until the Company was closer to starting its roadshow. The underwriters further cautioned that the estimated range was qualified by many assumptions that may not prove to be correct, including the following:

- a successful completion of the offering prior to February 14, 2011;
- no material adverse change in the public markets, the market for new offerings and the market for life sciences tools companies in particular; and
- continued growth and progress in the Company's business.

The price range that appears in the Registration Statement filed on January 28, 2011 was not finalized until January 27, 2011 and was based on discussions between the Company and its underwriters from January 20, 2011 through January 27, 2011. Unlike the IPO pricing estimate provided by the underwriters, which of course assumes an IPO is completed, the fair value per common share determined by the board did account for the risk that the IPO may not be feasible or successful, that conditions in the market for initial public offerings may change (such as, for example, geopolitical events in Egypt, that caused a 160 point drop in the Dow on January 28, 2011) and that delays in the IPO process, including a requirement for 2010 audited financials, could cause the Company's plans to be deferred until mid 2011 or later [***] without visibility into what the market conditions will be with respect to new issues at that time.

- Weighting of Alternative Outcomes. The board considered the status of the Company's business, its discussions regarding a possible sale of the Company and the status of the Company's efforts to complete an initial public offering. The board considered the rights and preferences of the Company's preferred and common stock and the differences in returns to such stock under each scenario. Based on their own view and that of management, the board assigned a probability weighting of 60% to the IPO outcome and 40% to the sale outcome based on all available data on the status, risks and uncertainties of each outcome. As indicated in our prior response, the Company intentionally and actively pursued both public financing and sale alternatives throughout December 2010 and January 2011, in large part due to the uncertainty of the public market for new issues. While reasonable people may differ as to the relative probabilities of an IPO and a sale at any point in time, the Company's board exercised their best judgment after taking into account all available information, including the Company's experience in 2008. Even as of the date of this letter, the Company's prospects for completing an IPO are still not assured, nor are the Company's prospects for completing an IPO in early February 2011 or within the price range estimated by the underwriters and the board. As discussed above, the value of the common stock in a sale scenario is substantially lower than in an IPO scenario. As a result, this weighting resulted in a fair value of the common stock that is less than the estimated offering range, but, in the opinion of the board, reflective of the true value of the shares given the range of possible outcomes.

Based on the foregoing factors and the explanations previously provided, the Company respectfully submits that the January 2011 option grants were priced and will be accounted for in accordance with the requirements of ASC 718, Compensation-Stock Compensation, the AICPA Guidelines and the regulations regarding the granting of options to employees in the United States as "incentive stock options" under the Stock Plan and the Internal Revenue Code of 1986, as amended.

2. ***The minimum offering price per share threshold of \$19.915 was removed as a result of discussions between the Company and its stockholders. Please consider disclosure of any agreement or arrangement to this effect under the heading "Certain Relationships and Related Party Transactions" pursuant to Item 404 of Regulation S-K.***

The Company has reviewed the requirements of Item 404 of Regulation S-K and respectfully submits that the approval and filing of its sixth amended and restated certificate of incorporation does not constitute a transaction subject to the disclosure requirements of Item 404. Item 404 applies to transactions in which the Company was a participant in which any related person had a direct or indirect material interest. For purposes of Item 404, a transaction includes, but is not limited to, any financial transaction, arrangement or relationship (including any indebtedness or guarantee of indebtedness) or any series of similar transactions, arrangements or relationships.

In December 2010, the Company recognized that the minimum threshold of \$19.915 (pre-split) per share in the automatic conversion provisions of its certificate of incorporation could prevent, or at least add uncertainty to its IPO efforts. The Company also recognized that an IPO transaction at a price per share below the Series E price of \$14.00 (pre-split) per share would trigger a significant adjustment in the conversion rate of its Series E preferred stock, giving the holders of Series E preferred stock substantially more shares of common stock upon their conversion. In an effort to reduce this uncertainty and provide a fixed capitalization structure to potential investors in the Company's IPO, the Company proposed to amend its certificate of incorporation to remove the \$19.915 minimum threshold for automatic conversion and adjust the Series E conversion rate to give the holders of its Series E preferred stock some but not all of their conversion price adjustment. The amendment required the approval of holders of common stock and preferred stock, not just the holders of Series E preferred stock. The Company obtained broad stockholder approval and the certificate of incorporation was amended on January 6, 2011.

The Company respectfully submits that the amendment of its certificate of incorporation to remove the minimum price requirement of \$19.915 per share was not a related party transaction for purposes of Item 404. The amendment represented the exercise by stockholders of certain rights under the existing certificate of incorporation and the waiver of others rights and the amendment was no different than the execution by stockholders of a typical consent to a company's initial public offering. No additional consideration was paid or received by the Company. Most companies in preparation for an initial public offering will obtain stockholder approval of various matters in connection with the IPO, including approval of a new post-IPO certificate of incorporation and bylaws, conversion of the preferred stock into common stock and, in some cases, waiver of stockholder rights to sell or purchase shares in the IPO. The Company respectfully submits that the amendment and restatement of its certificate of incorporation was part of the ordinary governance process for an IPO and not a related party transaction for purposes of Item 404.

3. **Options to purchase the Company's common stock were granted to executive officers on January 4, 2011. Please consider adding disclosure of these grants under the heading "Certain Relationships and Related Party Transactions" pursuant to Item 404 of Regulation S-K.**

The Company respectfully submits that the Registration Statement contains disclosure regarding all material aspects of equity compensation of the Company's executives. The section captioned "Certain Relationships and Related Party Transactions" in the prospectus includes a subsection captioned "Stock Option Grants" on page 123 that states: "Certain stock option grants to our directors and executive officers and related option grant policies are described above in this prospectus under the caption "Management." The Management section of the prospectus contains a detailed description of the Company's equity compensation practices for executive officers including the Company's practices and policies for annual executive grants. The first paragraph following the bullet points on page 102 of the Management section discusses annual option grants to executives in prior years and states that "[i]n January 2011, the compensation committee made grants of the same amount and with the same structure [as in prior years] tied to achievement of our 2010 corporate and department goals." The executive grants approved in January 2011 are consistent in amount and timing with annual grants to executive officers in prior years and the January 2011 grants to outside directors are consistent with the Company's pre-offering policy on option grants to outside directors, as disclosed on page 94 of the prospectus, which provides for annual grants to outside directors of 15,000 (pre-split) shares in January of each year. Finally, Part II of the Registration Statement includes disclosure regarding the January 2011 grants to executive officers and directors in paragraph (v) on page II-4, which provides as follows: "[i]n January 2011, the registrant granted to fourteen of its executive officers and directors under the registrant's 2009 Equity Incentive Plan, as amended, options to purchase an aggregate of 138,150 [post split] shares of its common stock at an exercise price of \$8.38 per share." This figure is higher than the 106,929 (post-split) figure set forth on Exhibit A hereto because the total in Part II included certain persons who are lower level managers and not executive officers as defined under the Securities Exchange Act of 1934, as amended.

A list of option grants to executive officers and directors in January 2011 is attached hereto as Exhibit A. Of the total 428,698 (post-split) grants in January 2011, only 106,929 (post-split) or 24.9% were granted to executive officers and directors of the Company. Exhibit A also includes information on total stock and options held by each such officer and director, the January 2011 grants as a percentage of total stock and options held by each such person and the January 2011 grants as a percentage of the Company's total stock and options outstanding as of January 31, 2011. As indicated by Exhibit A, the January 2011 grants to executive officers and outside directors represent a *de minimis* equity position, both in terms of each individual's total holdings and in terms of all outstanding shares plus options. Accordingly, the Company respectfully submits that no further disclosure regarding the January 2011 grants is necessary or material to investors in the offering.

* * * * *

Please direct your questions or comments to me (650/320-4557), David Segre (650/320-4554) or Robert Kornegay (650/320-4533). In addition, we respectfully request that you provide a facsimile of any additional comments you may have to my attention as well as that of Messrs. Segre and Kornegay at (650/493-6811). Thank you for your assistance.

Very truly yours,

WILSON SONSINI GOODRICH & ROSATI
Professional Corporation

/s/ Asaf Kharal, Esq.

cc: Gajus V. Worthington
Vikram Jog
William M. Smith
Fluidigm Corporation

EXHIBIT A

Options Granted in January 2011
(post-split)

Name	Title	Grant Date	Options Granted in January 2011	Total other Options and Shares Held	January 2011 Grants as a % of Total Held	January 2011 Grants as a % of Diluted Shares Outstanding
Executive Officers						
Gajus V. Worthington	President, Chief Executive Officer and Director	01/04/2011	11,560	507,734	7.81%	0.07%
Vikram Jog	Chief Financial Officer	01/04/2011	11,560	112,714	8.64%	0.07%
Fredric Walder	Chief Business Officer	01/04/2011	5,779	115,606	4.54%	0.04%
Robert C. Jones	Executive Vice President, Research and Development	01/04/2011	11,560	125,509	7.78%	0.07%
William M. Smith	Vice President, Legal Affairs, General Counsel and Secretary	01/04/2011	11,560	196,026	6.82%	0.07%
[***]						
Outside Directors						
Samuel D. Colella	Director	01/06/2011	8,670	16,927	33.33%	0.05%
Kenneth Nussbacher	Director	01/06/2011	8,670	41,700	14.68%	0.05%
Raymond J. Whitaker	Director	01/06/2011	8,670	8,670	33.33%	0.05%
John Young	Director	01/06/2011	8,670	8,670	33.33%	0.05%
Jeremy Loh	Director	01/06/2011	8,670	—	50.00%	0.05%
Total Executive Officers and Outside Directors			106,929	1,245,689	7.91%	0.66%
Total Other Employees			321,769			1.99%
Total of All Grants			428,698			2.65%
16,139,531	<i>Fully diluted shares outstanding as of January 11, 2011</i>					
18,327	<i>Additional option grants after January 11, 2011</i>					
16,157,858						