



DIVISION OF
CORPORATION FINANCE

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

August 25, 2011

Via E-mail

David Lazovsky
President and Chief Executive Officer
Intermolecular, Inc.
3011 N. First Street
San Jose, CA 95134

**Re: Intermolecular, Inc.
Registration Statement on Form S-1
Filed July 29, 2011
File No. 333-175877**

Dear Mr. Lazovsky:

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.

Prospectus Summary, page 1

1. Please tell us the objective criteria you used to determine which customers to identify in the second paragraph on page 1 and elsewhere in your prospectus. Tell us whether you have named all customers that satisfy that criteria.
2. Please provide us with independent support for the statements regarding your platform and programs in the summary and throughout your prospectus, including that you have "pioneered" the approach, that your platform allows "R&D to be performed at speeds 10 to 100 times faster than traditional methods," that you can perform up to 192 experiments compared to single experiments with traditional methods, as well as your statement regarding "faster processing of experiments" on page 3.
3. Please disclose your accumulated deficit in your summary.

Our Company, page 1

4. We note your disclosure that you currently target semiconductor and emerging clean-energy markets, including DRAM, flash memory, complex logic, flat glass, solar cells, LEDs and other energy efficient technologies. Please revise your disclosure so that it is clear if you have derived a material amount of revenues from the development of technology related to each of the markets you list.

Industry, page 2

5. For all industry and market information cited in the prospectus, please provide us with marked copies of the reports and data upon which the disclosure is based. Also, please tell us:
 - whether all of the information is publicly available;
 - whether you paid for the compilation of any of the data;
 - whether any information was prepared for your use in the registration statement; and
 - whether the authors of the information consented to your use of such data in the registration statement.

To the extent that you were affiliated with the preparation of any of the data, please ensure that your disclosure clearly indicates the nature of all such affiliations.

6. With reference to your disclosure that “it is increasingly necessary to evaluate elements in the periodic table that have previously not been used in high-volume manufacturing,” please disclose any successes that you have achieved to date in developing structures using elements not previously used. Please also disclose any known limitations that the foundries would have in being able to incorporate novel structures into their manufacturing processes.

Risks Related to Our Financial Condition and Business, page 4

7. Please highlight in your summary the risks relating to the need to convince your customers to grant you access to their proprietary information despite your potential arrangements with their competitors and potential conflicts of interests.
8. We note the second bullet on page 5. With a view towards disclosure in the prospectus, please tell us whether you have lost any customers after committing significant resources to a project.

Risk Factors, page 11

9. Please add risk factor disclosure addressing the extent to which your revenue is derived from related party transactions as indicated in the table at the bottom of page F-4, as well as the ownership interests by your major customers.
10. We note that your business model anticipates developing proprietary technology and then sharing that technology with your customers through various fee arrangements and licensing agreements. If material, please add risk factor disclosure addressing the resistance you may face from your intended customer's adopting a shared intellectual property arrangement with you and if such an arrangement could be perceived as creating more risk in terms of intellectual property disputes among you, your customers and third parties. Also describe any challenges that such an arrangement could potentially have on your customers' ability to realize the value of those rights through a transfer of those intellectual property rights, through an asset sale or licensing agreement, or sale of the company as compared to if they developed the intellectual property in-house.

We may face market resistance to the royalty element of our business model, page 14

11. Please expand this risk factor to clarify why customers may object to the royalty element of your business model. In an appropriate section, please discuss how you intend to overcome any potential market resistance.

If we lose one or more, page 18

12. We note your disclosure on page 19 that your projects last for a "significant period of time." In an appropriate section, please quantify the length of your projects, including the average and the high and low duration times of a typical project.

We may be unable to effectively protect, page 19

13. With a view towards expanded disclosure, please tell us the extent of your intellectual property developed with the U.S. government indicated in the third paragraph on page 20.

We are subject to warranty claims, page 24

14. In an appropriate section, please disclose the extent and material terms of your warranty obligations.

Our ability to use our net operating loss carryforwards, page 27

15. Please revise to quantify your net operating loss carryforwards and to briefly discuss the types of changes in stock ownership that could lead to a Section 382 ownership change. Please tell us why you have not determined whether you have undergone a Section 382

ownership change in the past and why you cannot determine whether you will undergo an ownership change in connection with this offering.

Capitalization, page 34

16. Please revise to remove the caption relating to cash and cash equivalents from your capitalization table.

Management's Discussion and Analysis, page 44

17. We note your disclosure in the last risk factor starting on page 18 regarding the importance of your employees and the necessity of retaining your "unique team" of scientists and engineers, as well as your disclosure that your projects last for a significant period of time. In an appropriate section, please discuss the scalability of your business, providing investors with information regarding how close you are to work capacity given your current facilities and number of employees, and the amount of resources that would be necessary to expand your capacity.

Revenue mix and royalty rates, page 47

18. Please expand your disclosure to clarify the different gross margin contributions and royalty opportunities by industry and end market.

Cost of Revenue and Operating Expenses, page 48

19. We note that the cost of product revenue has varied significantly over the past three years as a percentage of revenue. Please expand your discussion to include a discussion of cost of revenue as a percentage of revenues, any significant changes to those percentages and the significant reasons for those changes.

Results of Operations, page 50

20. We note the variances in operating losses and net losses during the periods presented. Under separate captions, please expand your disclosure to explain clearly to investors the reasons for the variances in your operating and net losses for the periods presented. Also disclose any known material trends affecting your operating and net losses for the periods presented. Refer to Item 303(b) of Regulation S-K.

Revenue, page 50

21. Please revise here and for other comparative periods to clarify why your product revenue decreased. Discuss any trends in product revenue in an appropriate section.

Business, page 69

22. We note that you are targeting the market for application specific integrated circuits. We understand that the products of designers and manufacturers of programmable logic devices are intended to be an alternative to application specific integrated circuits and that programmable logic devices may have some competitive advantages over application specific integrated circuits in terms of development costs and time to market. If true, please disclose the competitive position of your business proposition in light of the competition faced from programmable logic devices and revise your risk factors and prospectus summary section as appropriate.
23. We note your disclosure in the last paragraph on page 69 that the semiconductor market had \$304 billion in sales in 2010. If you are targeting the application specific integrated circuit portion of the semiconductor market, please tell us if you have industry data that is more specific to your intended market.
24. We note your disclosure regarding the amount of revenue generated from related party transactions in the table at the bottom of page F-4, and the disclosure in Note 11 starting on page F-34. Please disclose the purposes and benefits to you and your customers in conducting your business this way and granting ownership interests to your major customers. Discuss whether, and why or why not, you expect these types of arrangements will continue after the completion of the public offering.
25. Please add a separately captioned section discussing the material terms of your development and purchase agreements filed as exhibits 2.1 and 10.3 through 10.10.
26. Please tell us why you have not disclosed the supply information required by Regulation S-K Item 101(c)(1)(iii) given your disclosure in the first risk factor starting on page 23.

Intellectual Property, page 81

27. Please disclose the duration of your patents and the expected duration of your licensed patent rights.

Competition, page 83

28. Please revise this section to indicate your competitive position within your industry.

Management, page 85

29. Please tell us the positions Mr. Lazovsky held at Applied Materials.

Certain Relationships, page 116

30. Please file your agreements with Symyx as exhibits.
31. Please tell us where you have disclosed the information required by Regulation S-K Item 404 with respect to the transactions discussed in Note 11 starting on page F-34.

Principal and Selling Stockholders, page 120

32. When you have determined your selling stockholders, please tell us whether any of them are broker-dealers or affiliates of a broker-dealer.

Consolidated Financial Statements, page F-1

33. Please update the financial statements to comply with Rule 3-12 of Regulation S-X.

Consolidated Balance Sheets, page F-3

34. Please tell us why you classify inventory as a long-term asset.

Note 1. The Company and Summary of Significant Accounting Policies, page F-8

Unaudited Pro Forma Stockholders' Equity, page F-8; and Unaudited Pro Forma Net Loss per Share of Common Stock, page F-16

35. We note the automatic conversion terms of the redeemable convertible preferred stock disclosed on page F-22. Please tell us why you believe the pro forma presentation assuming the automatic conversion of the redeemable convertible preferred stock is factually supportable.

Note 5. Commitments and Contingencies, page F-19

36. We note in your risk factors that you are subject to warranty claims. Please tell us how you account for warranties and how you considered the disclosures required by ASC 460-10-50.

Note 9. Net Loss per Share of Common Stock, page F-31

37. We note you assume the exercise of certain preferred and common stock warrants that expire upon an initial public offering. Please tell us the basis for your assumption and why you believe it is factually supportable.

38. We note that elsewhere in the filing, your pro forma presentation only assumes the exercise of common stock warrants that expire upon the an initial public offering. Please tell us the reasons for the differences in these presentations.

Note 13. Subsequent Events, page F-36

39. Please tell us how you intend to account for the July 28, 2011 agreement with Symyx, the guarantee of the value of the shares to be sold and the acquisition of the patents. Cite the accounting literature you relied upon and how you applied the literature to your facts and circumstances. Explain how you plan to determine the value of the patents acquired.

Exhibits

40. Please resolve any comments on your confidential treatment request prior to requesting effectiveness of your registration statement.

Exhibit 23.1

41. To the extent there is a delay in requesting effectiveness of your registration statement, an other than typographical change made to the financial statements, or there have been intervening events since the prior filing that are material to the company, please provide a currently dated and signed consent from your independent accountants with your next amendment.

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.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

David Lazovsky
Intermolecular, Inc.
August 25, 2011
Page 8

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact Dennis Hult at (202) 551-3618 or Kaitlin Tillan at (202) 551-3604 if you have questions regarding comments on the financial statements and related matters. Please contact Louis Rambo at (202) 551-3289 or Tim Buchmiller, reviewing attorney, at (202) 551-3635 with any other questions.

Sincerely,

/s/ Tim Buchmiller for

Russell Mancuso
Branch Chief

cc (via e-mail): Patrick A. Pohlen
Latham & Watkins LLP