Mail Stop 4720

January 12, 2010

Tuan Ha-Ngoc
Chief Executive Officer
AVEO Pharmaceuticals, Inc.
75 Sidney Street
Cambridge, Massachusetts 02139

Re: AVEO Pharmaceuticals, Inc.
Registration Statement on Form S-1, filed December 16, 2009
File No. 333-163778

Dear Mr. Ha-Ngoc:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with supplemental information so we may better understand your disclosure. After reviewing this information, we may or may not raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

General

1. Please note that our comments on your request for confidential treatment will be provided under separate cover.

2. Please note that when you file a pre-effective amendment containing pricing-related information, we may have additional comments. As you are likely aware, you must file this amendment prior to circulating the prospectus.

3. Please note that when you file a pre-effective amendment that includes your price range, it must be bone fide. We interpret this to mean that your range may not exceed $2 if you price below $20 and 10% if you price above $20.

4. Please note that where we provide examples to illustrate what we mean by our comments, they are examples and not complete lists. If our comments are applicable to portions of the filing that we have not cited as examples, please make the appropriate changes in accordance with our comments.

5. Please provide us proofs of all graphic, visual or photographic information you will provide in the printed prospectus prior to its use.

6. Throughout your filing you refer to Tivozanib as "novel." We also note that Tivozanib is not the first VEGF-pathway targeted drug. Please delete the reference to "novel" or explain why Tivozanib is novel compared to other VEGF-pathway targeted drugs.

Prospectus Summary, page 1
Overview, page 1

7. Please define "progression-free survival" the first time you use this term here and in the Business section.

8. You state that your Human Response Platform provides you with "unique insights" into cancer biology and mechanisms of drug response and resistance, and represents "a significant improvement over traditional approaches." Please expand to describe why the Human Response Platform provides you with unique insights and represents a significant improvement over traditional approaches. Also, please briefly identify the traditional approaches.

9. Please revise your disclosure to state that currently you have no FDA-approved products and that to date you have not generated any commercial revenue from the sale of any products.

10. You state that you have raised $165 million, including $87 million of non-dilutive capital through a number of strategic partnerships. On page 43, however, you state that you have funded your operations through $87.4 million from your strategic partnerships and $169.6 million from sales of convertible preferred stock. Please revise your disclosure to eliminate this apparent inconsistency.

11. Please briefly describe in your summary the terms of your strategic partnerships with Merck, OSI, Schering-Plough (now Merck) and Biogen Idec.

Risk Related to Our Business, page 2

12. Please revise your disclosure to present the list of risks in bullet-point format. Also, please expand the list to include other substantial risks.

Risk Factors, page 7

13. Please delete the statement "[t]he risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business." It is not appropriate to refer to other risks that are not disclosed.

Risks Related to Our Financial Position and Capital Requirements, page 12
We have incurred net operating losses since our inception…, page 12

14. Please expand the heading of this risk factor to describe that failure to achieve or sustain profitability would depress the market price of your common stock, which could also cause investors to lose all or part of their investment.

A substantial portion of our future revenues may be dependent upon our agreements…, page 13

15. Please expand your disclosure to provide the page number for the risk factor you reference in the second paragraph of this risk factor.

If we fail to attract and keep senior management and key scientific personnel…, page 15

16. To the extent that you have experienced problems attracting and retaining qualified employees in the recent past, please revise to describe these problems. Additionally, if any key employee has plans to retire or leave your company in the near future, please revise the discussion to disclose this information.

17. Please revise your disclosure to state whether you have employment agreements with all the individuals named in this risk factor. Also, please disclose the term of any such agreements.

We may incur significant costs complying with environmental laws…, page 17

18. We note that you are uninsured for third-party contamination injury. To the extent you have any other insurance coverage covering hazardous, radioactive or biological materials, please disclose your level of insurance coverage. In the alternative, if you have no such coverage, please expand your disclosure to clarify that you have no coverage rather than just describing that you do not have coverage for third-party contamination injury.

Risks Related to Our Dependence on Third Parties, page 20
If any of our current strategic partners fails to perform its obligations…, page 20

19. Please expand this risk factor to briefly summarize the term and termination provisions of your strategic partnerships with Merck, OSI and Biogen Idec.

We rely on third-party manufacturers to produce our preclinical and clinical drug supplies, page 23

20. Please identify here and on page 100 the sole-source supplier of the active pharmaceutical ingredient for tivozanib. Also, to the extent you have any agreement with such party, please so indicate and describe in your Business section the material terms of the agreement. You should also file the agreement as an exhibit to the registration statement, if material. If you have determined that you are not substantially dependent on this party, please provide us with an analysis supporting this determination.

Risks Related to Our Intellectual Property Rights, page 24
We could be unsuccessful in obtaining adequate patent protection…, page 24

21. Please update your disclosure to state the number of U.S. patents you have filed, how many of those were granted, how many of those are still pending, and the specific product candidates or technology to which the patents relate. Please disclose the same information for other jurisdictions in which you anticipate that sales may be material in the future.

Claims that our platform technologies, our products or the sale or use of our products…, page 25

22. Please provide appropriate disclosure, if applicable, about threats of litigation or negotiations regarding patent issues or other intellectual property, court challenges, legal actions, etc.

Risks Related to This Offering and Ownership of Our Common Stock, page 29
You will incur immediate and substantial dilution as a result of this offering, page 31

23. Please revise this risk factor to explain that investors who purchase shares will contribute ____% of the total amount to fund the company but will own only ___% of the shares outstanding.

We will incur increased costs as a result of being a public company, page 31

24. This risk factor, as currently written, could apply to any initial public offering. Please delete the risk factor or revise it so that it addresses your situation more specifically.

Cautionary Note Regarding Forward-Looking Statements, page 33

25. We note that you have obtained statistical and other industry data from independent parties and that you have not independently verified any of that

information. It is not appropriate to disclaim liability for statements included in your registration statement. Please revise to delete this apparent disclaimer of liability or specifically state that you are responsible for the referenced statements. This comment equally applies to your disclosure under the heading "Industry and Market Data" on page 36.

Use of Proceeds, page 34

26. Please revise your disclosure to separately allocate the amount of proceeds you anticipate you will use for each of the intended purposes described in this section. Also, with respect to the proceeds that you plan to use to fund your research and development activities, please identify each of the development programs that you plan to fund, and state what stage of development you expect to achieve for each of them.

Management's Discussion and Analysis, page 43
Strategic Partnerships, page 44
OSI Pharmaceuticals, page 44
Biogen Idec, page 45

27. You disclose that once a development candidate has been selected, you will begin amortizing all license revenue under the Biogen Idec agreement over the projected patent life of the candidate. Please tell us when you expect to select a development candidate, and describe each significant future event that must occur prior to your selection of a development candidate.

Critical Accounting Policies and Significant Judgments and Estimates, page 50
Stock-Based Compensation, page 52

28. Please disclose in the Management's Discussion and Analysis the following information relating to your issuances of equity instruments (stock options, convertible preferred stock, common stock, etc.):

- A discussion of each significant factor contributing to the differences between the fair value as of the date of your most recent grant, the estimated IPO price, and if a contemporaneous valuation by an unrelated valuation specialist was obtained subsequent to the grants but prior to the IPO, the fair value as determined by that valuation and the assumptions and methodology used; and
- If a contemporaneous valuation was not obtained as described above, the reason management chose not to obtain a contemporaneous valuation by an unrelated valuation specialist.
- Quantify the assumptions used in determining the 24% discount rate and clarify to us the reason for the assumptions used. Clarify that you used the same peer group in determining the betas and explain to us the basis for the premium for company-specific risk used.

- Please note that we will consider the accounting for a beneficial conversion feature relating to the convertible preferred stock issued in 2009 along with the amount of deferred revenue being recorded relating to the premium once an IPO price has been determined.
- Please confirm that no equity issuances were made subsequent to September 30, 2009 or provide additional disclosure in the filing including the anticipated effects on results of operations.

29. It appears that you are using different peer groups to determine volatility and term discussed on page 52 than the peer group used in the Guideline transaction method in determining the fair value of common stock. If such is the case, please clarify why and how it affects your results of operations.

Liquidity and Capital Resources, page 62

30. You disclose that the decrease in cash used in operations in 2007 was due primarily to an increase in deferred revenue of $17.5 million. Please also disclose any significant offsetting amount(s) to arrive at the net $13 million decrease in cash used in operations in 2007.

Contractual Obligations and Commitments, page 64

31. You disclose in note seven to the financial statements that your other license agreements call for sales and development milestones. Include in the contractual obligations table the cash obligations under your other license agreements disclosed on page F-23. Where uncertainties prevent making a reasonable estimate of the obligations, explain the uncertainties in a note to the table indicating aggregate milestone payments, their timing, events triggering their payment and expected effects on financial position, operations and capital resources.

Business, page 67

32. Throughout this section you cite various estimates, statistics and other figures. For example, on page 71 you disclose that sales of VEGF pathway inhibitor drugs exceeded $6 billion in 2008 and that drugs targeting angiogenesis are projected to have sales of nearly $14 billion by 2014. Please attribute these statements and any other similar statements to the source from which you obtained the information. Where you cite your own estimates, please explain how you arrived at those estimates and disclose any third-party sources you relied upon.

33. Please describe how you developed Tivozanib and the Human Response Platform and whether you acquired any know-how or intellectual property from others. If you developed your know-how and intellectual property in-house, please state

that in your disclosure. On the other hand, if you acquired any know-how or intellectual property from others, please describe the agreements through which you acquired that know-how or intellectual property. Any agreement that you describe should also be filed as an exhibit to the registration statement.

34. Please clarify what you mean by the incidence of side effects commonly associated with other VEGF receptor inhibitors being "notably low."

Product Pipeline, page 70
Tivozanib: Triple VEGF Receptor Inhibitor, page 70
Clinical Trials, page 74
Phase 3 Clinical Trial, page 77

35. Please disclose the number of patients that have enrolled in this clinical trial as of the most recent practicable date.

AV-299: Anti Hepatocyte Growth Factor (HGF) Antibody, page 79

36. You disclose on page 81 that the chart shows that eleven out of 24 patients experienced stable disease lasting for 12 weeks or more. However, the chart appears to show the number of weeks the patients spent on the study, not the number of stable-disease weeks. Please clarify.

AV-203: Anti-ErbB3 Antibody Program, page 82

37. Please disclose whether you have already submitted to the FDA an investigational new drug application for AV-203. If you have, please also disclose the date of such application.

Our Human Response Platform, page 84

38. Please identify by name your scientific founders.

Limitations of Existing Cancer Models, page 85

39. Please provide the basis for the statement that "[i]t is now well-accepted that xenografts models are often poor predictors of the success of drugs in human clinical trials."

Our Novel Approach to Modeling Human Cancer, page 85

40. Please explain what you mean by the terms: (1) chimeric mouse and (2) germ line transgenic mouse.

Strategic Partnerships, page 89
OSI Pharmaceuticals, page 91

41. We note that your agreement with OSI provides that upon commercialization of products you will be eligible to receive tiered royalty payments on sales of products by OSI, its affiliates and sublicensees. Please disclose the range of royalty payments (for example, low teens or mid teens as a percentage of net sales).

42. If material, please disclose the option fee or fees payable by OSI to receive perpetual rights to elements of your Human Response Platform and to obtain certain of your tumor models and tumor archives.

Biogen Idec, page 93

43. Please provide the aggregate amount of near-term pre-clinical discovery and development milestone payments Biogen may be obligated to pay under the exclusive option and license agreement.

Schering-Plough (now Merck), page 95

44. Please disclose the range of royalty payments that you would be eligible to receive from Merck upon commercialization of AV-299.

Merck, page 96

45. Please disclose the range of royalty payments that you would be eligible to receive from Merck pursuant to your target identification collaboration.

Patents and Proprietary Rights, page 97
General Intellectual Property Considerations, page 97

46. Please state for each of the bulleted categories on page 97 the number of U.S. patents you have filed, how many of those were granted, how many of those are still pending, and when the patent protection expires. Please disclose the same information for other jurisdictions in which you anticipate that sales may be material in the future.

Scientific Advisors, page 112

47. Please file as exhibits to the registration statement all consulting agreements with the members of your scientific advisory board.

Executive and Director Compensation, page 118
Compensation Discussion and Analysis, page 118
Overview, page 118

48. You state that you have not included a discussion of Dr. Ryan's compensation because he ceased to serve as an executive officer in 2008. Item 402(b) of Regulation S-K requires a discussion of the compensation awarded to, paid to, or earned by the named executive officer in the last completed fiscal year. Since Dr. Ryan was an executive officer in 2008, the Compensation Discussion and Analysis should also discuss his compensation, regardless of the fact that he ceased employment. Your next amendment should discuss the compensation of all applicable named executive officers, regardless of whether any such officer ceased employment during the prior fiscal year.

Executive Compensation Components, page 120
Annual Cash Incentive Program, page 121

49. You disclose that for the fiscal year ended December 31, 2008, your compensation committee set corporate and individual goals for your named executive officers, "including goals related to achievement of qualitative and quantitative operation and financial targets." With respect to quantitative operation and financial targets, please expand your disclosure to quantify those targets.

50. Please describe the individual goals of your named executive officers, other than your Chief Executive Officer.

51. Please disclose how the compensation committee and the board came to the conclusion that the company met 90% of its corporate goals and that the named executive officers met 90% of their individual performance goals. We note, for example, that with respect to company goals, the compensation committee had previously determined a specific weight for each of four different goals. You should describe which of those were met and to what extent, such that 90% of those goals were achieved.

Director Compensation, page 136

52. Please revise your director compensation table to disclose any compensation for providing scientific and/or business advice under the column "All Other Compensation."

Principal Stockholders, page 144

53. Please disclose the names of the natural persons that have voting and investment power over the shares owned by entities affiliated with Prospect Venture II, L.P.

Notes to Consolidated Financial Statements, page F-8
7. Collaboration and License Agreements, page F-19
OSI Pharmaceuticals (OSI), page F-20
Biogen Idec International GmbH (Biogen Idec), page F-22

54. Please tell us how you determined the fair value of the series E convertible preferred stock of $2.96 issued to OSI in July 2009 and the fair value of the series E convertible preferred stock of $2.91 issued to Biogen Idec in March 2009. Also, tell us the framework and authoritative guidance you relied upon for your valuation.

* * * * *

As appropriate, please amend your filing in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed decision. 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 the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, 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 this action as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as a 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. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Staci Shannon at (202) 551-3374 or Mary Mast at (202) 551-3613 if you have questions regarding comments on the financial statements and related matters. Please contact Sebastian Gomez Abero at (202) 551-3578 or Dan Greenspan at (202) 551-3623 with any other questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: Steven D. Singer, Esq.
Cynthia T. Mazareas, Esq.
Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, Massachusetts 02109