

# Case Study 3: Binding Site Barriers in Tumors

## Transport in Biological Systems

Fall 2015

In this Case Study, you will further develop your ability to manipulate and understand key concepts in transport. We now focus on the effects of multiple transport processes in the context of delivering antibodies to tumors. You have the freedom to choose the relevant literature and to choose the approach you will take. The final deliverable should demonstrate your comprehension of the material we have been covering as well as your understanding of the steps of abstraction taken to create a model from a physical system. It can take the form of a mini-review of some of the literature, reproducing and exploring an existing model, or developing your own model.

While I have provided you some papers in Public, you are welcome to seek your own. Additionally, if you are interested in other, related problems, there are some additional papers by Melody Swartz's group in the "other topics" folder. You will likely wish to include key items such as assumptions, system choices, governing equations, boundary or initial conditions, relevant parameters, etc. While a review of various existing papers would be acceptable, far better would be to create your own model to explore interesting problems (this is why I made you learn COMSOL).

I highly recommend that you perform this work in groups of 2-3. As always, this is not in order to take a divide and conquer strategy - all members of your team should be engaged in the work, feel as though they have contributed, and be able to explain it in detail (I will ask you all questions in class).

Prepare your written deliverable in the style of IEEE. Your document should be 3-4 pages and should include the following (though there is flexibility depending upon the approach you take):

- title
- authors
- brief abstract
- introduction (includes background and significance)
- methods (if relevant)
- results and discussion, including relevant figures (no more than 4)
- references cited

We will work on this case study in class. By Thursday, October 29th, you should have formed your team, done some background research, and come to class prepared to discuss the topic you will explore and approach you will take. Your team should continue to make progress outside of class, but we will continue to have working time on November 2nd and 5th. The draft of this report is due electronically by class time on Monday, November 9th. You will receive a review of the manuscript by the following class period. The final report is due on November 16th.