BMED 8813 IC1
Fall 2010
MW 3:05-4:25, *UAW 1214*

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Description: In this course you will:

- Engage in independent learning - both as an individual and as a team member.
- Tackle open-ended questions.
- Participate in student-led presentations and interactive group and class discussions.
- Develop skills in critical thinking, communication, reading and interpreting literature, hypothesis formulation, hypothesis testing.
- Engage in projects that focus on a topic of your choosing, coupled with a quantitative analysis of receptor-ligand interactions (e.g., binding, trafficking, signaling)
- Practice the integration of biological and engineering approaches when solving complex biomedical engineering problems.

Objectives: One year after you have taken this course, you should:

- Have an understanding of the fundamentals of receptor-ligand interactions, particularly in the context of current research efforts in an area of your interest
- Be able to critically read, evaluate, and review scientific manuscripts, including those that use mathematical models of receptor-ligand interactions.
- Be able to pose a well-developed research question that can be tested through the combined use of hypothesis-driven experiments and mathematical modeling.
- Be able to create and implement a mathematical model that makes explicit the implications of a well-developed research question.
- Be able to design an effective experimental plan that will generate data that can be used, in combination with a mathematical model, to answer a well-developed research question.
- Have an understanding and appreciation for the value of mathematical modeling to biomedical research and engineering, and see yourself as

someone who can interact with colleagues in your area of research on matters that involve experimental design and mathematical modeling.

References: *Receptors: Models for Binding, Trafficking, and Signaling,* D. A. Lauffenburger, and J. J. Linderman, Oxford University Press (1993)

Modeling Biological Systems: Principles and Applications, James W. Haefner, Springer (2005)

Molecular Biology of the Cell, 5th edition, Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2007)

Essentials of Writing Biomedical Research Papers, 2nd edition, M. Zeiger, The McGraw-Hill Companies, Inc. (2000)

Readings: You will be required to read and analyze a number of research papers throughout this course. You will be expected to read and analyze these papers according to posted guidelines. Often, a written assignment will be assigned to accompany the reading. These papers will be discussed in class and are an integral part of class participation.

Homework: Homework is late if it is not turned in by the end of class on the date it is due. Late homework will not be accepted.

Grading:

Term Project: Final Paper	40%
Term Project: Oral Presentation	10%
Milestone assignments (there are 3)	10% each
HW assignments	20%

Honor Code: Students are expected to abide by the honor code (www.honor.gatech.edu). The objective of the honor code is "to prevent any students from gaining an unfair advantage over other students through academic misconduct". Any violations will be prosecuted through the Dean of Students.