BIBC126B: Molecular Mechanisms of Disease  
Fall 2015 Syllabus

“I believe medicine is just now entering into a new era when progress will be much more rapid than before, when scientists will have discovered the molecular basis of diseases, and will have discovered why molecules of certain drugs are effective in treatment, and others are not effective.” --Linus Pauling, 1952

In this course, you will learn what is known (and not) about the molecular mechanisms underlying a variety of diseases. I hope you will gain knowledge about specific disease mechanisms, basic biology and biochemistry, and also enhance your ability to understand the scientific literature, formulate thoughtful questions and write with scientific rigor.

**Learning objectives:**
During this course, you will have opportunities to:

- Identify molecular mechanisms of physiological and pathophysiological processes.
- Analyze, integrate and evaluate information from the scientific literature.
- Generate high quality questions and construct answers to those questions.
- Synthesize knowledge of molecular disease mechanisms in written and oral formats.

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**Materials:** You may access all articles to be discussed in class on the course webpage: sites.google.com/a/brandeis.edu/bibc126. You may also refer to texts on reserve in the library: Lehninger Principles of Biochemistry by Nelson and Cox, Molecular Biology of the Cell by Alberts, Textbook of Medical Physiology by Guyton.

**Grading:** You can earn 200 points in the class, distributed as follows:

*Attendance and Participation (50 pts, 25%):* I expect you to attend and actively participate in this course. I will provide opportunities for you to participate in a variety of ways, including annotation at Nb.mit.edu, group work and one minute papers. You may earn up to 3 points per class for quality contributions. Thus, there are 75 points possible in this category, but only 50 points maximum will count toward your grade. This allows for a few missed classes due to interviews, illness, or having a no good, very bad day.

*End of Module Activity (10 pts each, 25%):* At the end of each disease module, you will have an opportunity to synthesize what you have learned about the disease and then show your understanding in writing or in an interview. More details are available on the course website under “What I’ve learned.”

*Project (100 pts—distributed over assignments, 50%):* You and a collaborating classmate will choose 1 disease not covered in class to research for the Disease Project. Over the course of the semester, you will write 3 sub-papers (min. 2 pages, 5 references each) on specific, assigned aspects of the disease; your collaborator will cover different topics.
Then, you and your collaborator will edit and join together all of your sub-papers to form your partnership's final paper (~15 pages, 30 references min). The final paper will be a **timely review paper targeted for a non-expert scientific audience** in the style of the journal *Molecular Medicine*. You and your collaborator will also give a 25-minute oral presentation describing the disease, its molecular mechanism, and any therapies. More information is available on the **Disease Project** section of the course webpage.

"People cannot learn by having information pressed into their brains. Knowledge has to be sucked into the brain, not pushed in." Professor Victor Weisskopf (activelearning.org)

**How to approach this class:** I hope you will approach this class as an active learning adventure, where you are sucking knowledge into your brain! Here are a few tips as you embark...

Prepare for class! Read and annotate each assigned article. You don't need to memorize details, but you should try to understand the readings. For primary research articles, you should be able to answer the following questions:

1. What question(s) are the authors trying to answer?
2. What methods did the authors use?
3. What are the data?
4. What conclusions do the authors draw from these data? What conclusions do you draw?

For review articles, highlight key points and questions. Make schematics, lists, etc. to organize your knowledge. I don't expect you to understand or know everything. If you don't understand something, others likely don't either. So, please ask questions!

During this class, we will often work in groups. To be successful, this will require pre-class preparation by each individual student. All group work in the class, including the **Disease Project**, will be evaluated on an individual basis.

And finally, I do expect all students to abide by the University's Academic Integrity policy. For this class in particular, students must take care in identifying source material. My expectations are outlined in a memo written by Lori Tenser, Assistant Dean of Student Life, Brandeis University, December 12, 2002.

Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person–be it a world-class philosopher or your lab partner–without proper acknowledgement of that source.

**This means that you must use footnotes and quotation marks to indicate the source of any phrases, sentences, paragraphs or ideas found in published volumes, on the internet, or created by another student.** (emphasis added)

Violations of University policies on academic integrity, described in Section 3 of Rights and Responsibilities [now Section 4], may result in failure in the course or on the assignment, and could end in suspension from the University. If you are in doubt about the instructions for any assignment in a course, you must ask for clarification.

I look forward to learning about the molecular basis of disease with you. Please talk to or email me if you have questions or concerns.