Instructor: Prof. Lara K. Mahal  Office: Silver 823
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Office Hours: Meetings available upon request.

Course Description: This is a graduate level bio-organic/chemical biology course the purpose of which is to give you a working knowledge of bio-organic/chemical biology, introduce you to the latest research and give you literature skills. It is taught from the perspective of a chemical biologist, with an emphasis on what the discipline of chemistry can bring to the study of biological problems. It will follow a lecture/discussion format. The discussions will emphasize critical analysis of primary literature. Participation in the discussion is mandatory and part of your grade. You must do the assigned reading to participate. In this course evaluations will be based on 1) your leadership of a group discussion of assigned papers (everyone will be assigned to lead a discussion). 2) class participation, 3) weekly online quizzes and 4.) a proposal, written in the style of an NIH R21 proposal.

Course Webpage: The course website is on NYU Classes. It will be important that you monitor the course site on a regular basis as it will contain links to the assigned papers, homework assignments, quizzes, and other information crucial to your preparation for this class. You will need access to a computer and printer for this class.

Prerequisites: The prerequisites for this class are Undergraduate Organic and Physical Chemistry. In addition it is highly recommended (required for any undergraduates in the class) that you have a Biochemistry background at either the Undergraduate or Graduate level.


Recommended Materials: Access to any basic biochemistry book such as Biochemistry by Lubert Stryer or Principles of Biochemistry by Lehninger and a basic cell biology book such as Molecular Biology of the Cell by Alberts et al. are highly recommended as reference guides.

Homework: I will be assigning reading material. In general, you will be assigned a minimum of two papers a week to read in addition to the book, some weeks there will be 3 papers. Your reading of these materials will be crucial to your ability to participate in class discussions. Please note, your participation in these discussions constitutes 15% of your grade and everyone will be required to lead an in class discussion of a paper (20% of grade), so if you do not do the readings and participate in the scientific discussions, your highest possible grade will be a C which will not allow you to pass this class at the graduate level.
Attendance: Attendance is mandatory. This class is both a lecture and a discussion-based class, so attendance will be a part of your grade, reflected in class participation.

In Class Discussion Leader: All students will need to sign up to be an in class discussion leader for assigned papers. Signup will be online and will be made available after the first class. Students will each be assigned a paper to lead the discussion of (~20 min each). These student led discussions will start 2/1 and will count for 20% of your class grade.

Quizzes: There will be weekly online quizzes. These quizzes will be available for 24 hours on the Monday before class. Quizzes will start Monday Jan. 29. The quizzes will be done through NYU classes and are expected to be INDIVIDUAL WORK (i.e. no asking friends for help). The quizzes will derive from homework and reading assignments and will count for 30% of your total grade.

Exams: There will be no exams in this class. Instead, grades are based on quizzes, proposals and discussions.

Research Proposal and Presentation: A research proposal in the NIH R21 research format is required in this class. You will also be required to present your proposal in a 15 minute presentation during the last week of class. The presentation/proposal will constitute 35% of your grade.

Written Proposal. This proposal will be 6 pages in length plus a one page Specific Aims (not including references) and should detail ~2 years of work that has the potential lead to an RO1 (i.e. a 5 year proposal) in the general area of chemical biology. More details will be given in class. A 1 paragraph (each) summary of at least 2 proposal ideas is due to me by Thursday March 29th. You will get approval within a week to write your proposal on one of your ideas. The full proposal is due Thursday April 26. Upload an electronic version as a .pdf or word document into the Assignments tab on Classes. The written portion will be ~30% of the total grade. You will be given an opportunity to revise your proposal based on comment post-presentation. Any revised version will be due by Monday May 7.

Presentation. You will create a 10 minute presentation of your proposal that explains your proposal and gives enough background for us to evaluate it. Your fellow classmates will critique your proposal using NIH Guidelines. Presentations will occur during the last 1 1/2 weeks of class. The presentation grade (which will include as part of it the critiques by the class) will count for ~5% of the total grade.

Proposal Presentation Critiques. I will give each person a labeled folder containing blank critique sheets and instructions. Each person will hand me back this folder by Friday May 4th by 12p Noon. This folder should contain their critiques of the proposals presented. A box will be placed outside my office for the folders. The critiques should be taken very seriously as they will count towards your participation score and your critique scores will be taken into account in grading the research presentation. Anyone who turns their critiques in late will be penalized 10% of their grade for participation.
Grading Policy:  
Class Participation: 15%  
In-Class Discussion Leader: 20%  
Quizzes: 30%  
Research Proposal: 30%-Written, 5% Presentation

Academic Dishonesty: I expect each of you to conduct yourselves honorably. Students who violate the University rules on scholastic dishonesty (by, for example, working together on the Quizzes) are subject to disciplinary penalties including the possibility of failure in the course and dismissal from the University. Academic dishonesty includes improper lifting of phrases and/or proposals, from the web, etc. In addition, it is just wrong and you should know better, so just don't do it. Note, the proposals will need to be uploaded to NYU Classes and will be evaluated for plagiarism using Turnitin software.

Very Tentative Schedule

Week 1  
Intro/ Overview of Biomolecules/Chemical Biology/DNA

Week 2  
DNA technology/Nucleic Acid Synthesis

Week 3  
Nucleic Acid Recognition

Week 4  
RNA (ribozymes, riboswitches, etc.)

Week 5  
RNA-based technology

Week 6  
Translation

Week 7  
Chemical Biology and Translation

Week 8  
Spring Break

Week 9  
Peptide and Protein Synthesis

Week 10  
Enzymes/Posttranslational Modifications

Week 11  
Posttranslational Modifications

Week 12  
Basic Cell Biology/ In vivo sensors

Week 13  
High Throughput Chemical Biology (‘OMICS)

Week 14  
‘OMICS cont.

Week 15  
Proposal Presentations