CHEM 322: Biochemistry of Macromolecules

Fall Semester, 2004

-Course Syllabus-

Instructor: Roger Sandwick
Office Location: BIH, Room 451
Office Hours: 10 – 11 am W/F; 11 – 12 pm, Th
or please see/phone/email me to arrange a time
Office Phone: x 3496 Home Phone: (518) 992-8466
email: rsandwic@middlebury.edu

Textbooks: Lehninger's Principles of Biochemistry, 4th Edition, by David Nelson and Michael Cox; Freeman Publishing, New York, 2005

Course Description (from catalog): An introduction to biochemistry that begins with the study of the basic chemical components of a cell, including sugars, fatty acids, amino acids, and nucleic acids. The physical and chemical properties of proteins and nucleic acids are emphasized, providing a foundation for the discussion of current topics in molecular biology. Molecular biology is approached first in terms of process (transcription, translation, post-translation, granule formation) and then structures (DNA and gene structure, mRNA, translation product, mature and secreted protein). Understanding of techniques in biochemistry and molecular biology will be emphasized.

Student Evaluation:

70 % 3 Exams* (Dates: October 6th, Nov. 10th, Dec. 18th)
16 % "Weekenders" (2) and Reviews of Journal Articles in Discussion (2)
14 % Homework, Assignments, Preparation for and participation in Discussion, & Subjective

* Lowest grade weighted 50% of other scores.

Discussion: The discussion will be used to examine the primary literature for papers tied to the topics of the course. You will be given a broad topic and, beginning in the third week, students will give an 8 min review on a selected, recent paper that has a connection to the topic. A 4 – 5 min question/answer period will follow in which all students should participate. You are to prepare a one-page summary sheet (one-sided) of your own design for distribution to the class. The "weekenders" will follow each round of discussions. They will be take-home assignments that will examine your understanding of the biochemistry presented by your classmates in the discussion sections. You can use the one-page summary sheets and any notes you scribble on them in order to complete the assignment. Sorry, due to the different presentations of each section, you will need to attend the same discussion section each week. Attendance to the discussion is mandatory.

Course Outline: We will follow the order of the book relatively closely from Chapters 1 – 12 and 24 – 28. (Chapters 13 – 23 are dealt with in CHEM 425: Biochemistry of Metabolism.) A tentative schedule is as follows:

Tentative Fall, 2004 Schedule
(Chapters from Nelson and Cox in parenthesis)

September				
	T 14 Cell Structure and Water (1,2)		**Th 16** Water, Acids, & Buffers (2)	
	T 21 Amino Acids and Peptides (3)		**Th 23** 3D of Proteins (4)	
	T 28 3D of Proteins (4)		**Th 30** Protein Function (5)	

October				
	T 5 Enzymology (6)	**Exam** 7-10 pm	**Th 7** Enzymology (6)	
	T 12 Carbos (7)		**Th 14** *-- No Classes --*	
	T 19 Carbos (7)		**Th 21** Carbos (7)	
	T 26 Lipids (10)		**Th 28** Lipids (10)	***Weekender***

November				
	T 2 Lipids (10)		**Th 4** Nucleotides & NA (8)	
	T 9 Nucleotides & NA (8)	**Exam** 7-10 pm	**Th 11** DNA-based Tech. (9)	
	T 16 Genes & Chromosomes (24)		**Th 18** Replication (25)	
	T 23 Replication (25)		**Th 25** *-- Thanksgiving --*	
	T 30 Transcription (26)			

December				
			Th 2 Translation (27)	***Weekender***
	T 7 Translation (27)		**Th 9** Gene Expression (28)	
	Final Exam: Saturday, December 18th, 9 am - noon			

Discussion Schedule: Papers to be presented must be approved at least one week in advance.

First Round:
Sept. 13th: Rog
Sept. 20th: Rog
Sept. 27th: Amino Acids/Peptides
Oct. 4th: Protein Structure
Oct. 18th: Structural Proteins
October 25th: Enzyme Mechanisms

Second Round:
Nov. 1st: Rog
Nov. 8th: Carbohydrates
Nov. 15th: Lipids
Nov. 22nd: Nucleic Acid Structures
Nov. 29th: New DNA Technologies
Dec. 6th: Rog

Academic Honesty: You are expected to abide by the spirit of the Honor Code in all of your actions for this course. (See *Middlebury College Handbook*.) Obviously this means all work on exams must be your own. Except when noted, you may work collaboratively on in-class and out-of-class assignments, however, it is expected that all submissions are uniquely your own and represent primarily your effort.