

Biol/Chem 400 Fall 2007 Biochemistry I

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Biochemistry at work: Clotting is essential, yet can be fatal. Pathological activation of the clotting cascade can lead to the formation of a blood clot, typically a deep vein thrombosis (DVT) in the legs. This blood clot may then be carried in the bloodstream to the lungs. This is known as a pulmonary embolism and is a medical emergency, being one of the leading causes of sudden death. The most common inherited mutation that predisposes to thrombosis is the factor V Leiden mutation which is a single point mutation resulting in an amino acid substitution of arginine for glutamine at Arg 506.



COAGULATION FACTOR V

Office Hours:

Monday	10:00	Tuesday	8:00	Wednesday	10:00 -11:30
Thursday	8:00	Friday	8:00-11:00		

I will be in either my office (Hagen 407k) or my research laboratory (SL 208) during office hours and pretty much most other times of the day. You should make an appointment or contact me by e-mail before coming in, it will be easier to find me. I don't care how busy I am I will make time for your concerns.

Class Description: A survey of the chemistry and metabolism of living systems and nucleic acids biochemistry. Topics include biosynthetic biochemical pathways and nucleic acids biochemistry, signal transduction, biochemistry and cancer, protein synthesis and recombinant DNA theory. This course is not an approved biology elective for the Biology Major.

Learning Objectives: See the web pages for learning objectives for each semester.

Grades: There will be four examinations. Tests grades will be normalized to the high score for each test. Each regular examination will be normalized to 150 pts each. There are additional assignments outlined below. In addition, there will be several opportunities for extra credit. Each event will be announced in class by Dr. Provost. The grade cut offs are A-92%, B-80%, C-70%, D-60% and F-50%. These are tentative, may be decreased but will not be increased. Learning objectives and chapter questions will be provided but not graded.

Make-up examinations: These will be given only for major, documented emergencies (severe illness, death in family...) **prior notice** is required.

Resources:

(a) Lectures: The most important topics are always identified in class, and are usually discussed in detail. Attending class and accurate note-taking are the only way to learn the material.

(b) Textbook (Fundamentals of Biochemistry 2nd Ed.; Voet, Voet and Pratt): The reference chapters will clarify points, fill in gaps, and extend your knowledge. Portions of selected lectures will come from current literature and handouts. Reading the book is required, not suggested.

(c) Help sessions: We will have the help sessions as the schedule allows. Please do not hesitate to make an appointment to ask questions. I believe that there is no such thing as a stupid question. Your questions are the best guide I have to your particular needs. If you do not know enough to phrase a question, then meet with me and we can work it out.

Homework/Activities: These will be worth up to 18 % of your grade.

- (10 points each) Pathways: There will one or two times when you will be required to write out the pathways.
- (30 points) pH problems
- Writing Assignment(s): More information will be given in class and posted on the web. (30 points).
- **You are required to attend two seminars this semester.** Each seminar/talk will be worth 5 points. To get the points you must attend and submit a short synopsis of the talk with a review of the main point of the talk. (10 total points). See the class web site for the turn-in sheet. Each assignment is due three calendar days after the talk. Late reports will be docked 50%
- Extra Credit Seminars - There will be several opportunities to go to and write up a seminar/biochemical related topic for extra credit. Each event will announced in class by Dr. Provost and will be worth three points for a total of 21 maximum points accumulated throughout the semester. I will not review these until the end of the semester. It is your responsibility to keep up on what you've turned in. **Each assignment is due three calendar days after the talk. Late reports will be docked 50%**

Academic Honesty: See MSUM Student Absence Policy in the student handout or at www.mnstate.edu/sthandbook/policy/index.htm

Special Accommodations: Students with disabilities who believe that they may need an accommodation in this class are encouraged to contact Greg Toutes, Coordinator of Disabilities Services, at 477-2655 (phone) or 477-2047 (TTY), CMU 222, as soon as possible to ensure that accommodations are implemented in a timely fashion.

<u>Lecture</u>	<u>#</u>	<u>Topic</u>	<u>Chapter</u>
28 Aug Tues		Introduction and Cellular Organization Biochemistry in Action Video	1
30 Aug Thurs		Water & Colligative Properties pH and Buffers	2
4 Sept Tues		Buffers and Blood Buffering System Amino Acids and Peptide Bond	2/4
6 Sept Thurs		Protein Purification	5
11 Sept Tues		Protein Chemistry & Structure	5/6
13 Sept Thurs		Protein Function - Myoglobin & Hemoglobin	7
18 Sept Tues		Protein Function - Myoglobin & Hemoglobin	7
20 Sept Thurs		Carbohydrates	8
25 Sept Tues		Glycoproteins and Proteoglycans	8
27 Sept Thurs		Exam I	
2 Oct Tues		Lipids - Fatty acids and phospholipids Steroids and other lipids	9
4 Oct Thurs		Lipids - bilayers and membranes	9/10
9 Oct Tues		Enzymology Catalytic Mechanism	11
11 Oct Thurs		Mechanism of Action – Lysozyme, RNAase A & Proteases	11
16 Oct Tues		No Class – Fall Breather	12
18 Oct Thurs		Enzyme Kinetics - Michaelis-Menten	12
23 Oct Tues		Enzyme Kinetics - Inhibition	12
25 Oct Thurs		Enzyme Kinetics – Regulation of Enzymatic Activity	12
30 Oct Tues		Exam II	
1 Nov Thurs		Metabolism - Thermodynamics	13
6 Nov Tues		Metabolism - Metabolic currency	13
8 Nov Thurs		Glycolysis	14
13 Nov Tues		Regulation of Glycolysis	14
15 Nov Thurs		Glycogenolysis	15
20 Nov Tues		Exam III	
22 Nov Thurs		Thanksgiving	
27 Nov Tues		Glycogen Synthesis	15
29 Nov Thurs		Regulation of Glycogen Metabolism	15
4 Dec Tues		Gluconeogenesis	15
6 Dec Thurs		Krebs Cycle	16
11 Dec Tues		Krebs Cycle	16
19 Dec		Exam IV	