Course summary:
Biological Chemistry 550, Macromolecular Structure and Function, covers fundamental aspects of protein, membrane and nucleic acid structures, macromolecular recognition and interactions in signaling, protein maturation, gene expression and catalysis. This course is composed of lectures that use background reading materials, and faculty-led discussions of the primary scientific literature.

Course faculty:

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[link]

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office phone: 647-3734
office address: 3301 MSRB III
[link]
# 2010 Schedule for BioChem 550

<table>
<thead>
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<th>September</th>
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<tbody>
<tr>
<td>8</td>
<td>Xu</td>
<td>Protein Structure Organization I (lecture only)</td>
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<td>Protein Structure Organization II (lecture + quiz)</td>
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<td>Structure Determination (lecture + quiz)</td>
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<td>(DISCUSSION + quiz)</td>
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<td>Structure and Function V (lecture + quiz)</td>
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<td>Xu</td>
<td>(DISCUSSION + quiz)</td>
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<td>Basic principles of enzyme catalysis (lecture only)</td>
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<td>Hydrolysis of peptide bonds (lecture + quiz)</td>
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<td>Vitamins and cofactors (lecture + quiz)</td>
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<td>Radical enzymes (lecture + quiz)</td>
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<td>Allosteric regulation of enzyme activity (lecture + quiz)</td>
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<td>18</td>
<td>UM STUDY DAYS</td>
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<td>20</td>
<td>REVIEW</td>
<td>(no lecture)</td>
<td><strong>FIRST EXAM AT 7 PM</strong></td>
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<td>Smith</td>
<td>Biological Membranes - Structure, composition, physical properties (lecture only)</td>
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<td>Membrane Proteins (lecture + quiz)</td>
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<td>(DISCUSSION + quiz)</td>
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<td>Mechanisms of Signal Transduction (lecture only)</td>
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<td>(DISCUSSION + quiz)</td>
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<td>12</td>
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<td>(DISCUSSION + quiz)</td>
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<td>Nucleotide structure and chemistry (lecture only)</td>
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<td>RNA and DNA (lecture + quiz)</td>
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<td>Analysis of RNA structure and protein-nucleic acid interactions (lecture + quiz)</td>
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<td>RNA function (lecture + quiz)</td>
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<tr>
<td>26</td>
<td>THANKSGIVING</td>
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<td>29</td>
<td>Engelke</td>
<td>DNA-protein interactions (lecture + quiz)</td>
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<td>December</td>
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<tr>
<td>1</td>
<td>Engelke</td>
<td>RNA-protein interactions (lecture + quiz)</td>
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<td>3</td>
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<td>(DISCUSSION + quiz)</td>
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<td>Bochar</td>
<td>Chromatin Structure and Organization</td>
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<td>Chromatin Modification/Remodeling</td>
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<tr>
<td>10</td>
<td>Bochar</td>
<td>(DISCUSSION + quiz)</td>
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<td>13</td>
<td>REVIEW</td>
<td>(no lecture)</td>
<td><strong>SECOND EXAM AT 7 PM</strong></td>
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Lectures:
Lectures will take place in Room 1230 Undergraduate Science Building (USB, next to Life Sciences Institute) from 8:00 am (promptly) until 8:50 am on the days indicated in the meeting schedule. During many lectures, a short quiz will be given at the beginning of the lecture period.

Reading:
Papers assigned as lecture background or for discussion sections will be available as PDFs on the course cTools website. Lecturers might also provide references to defined sections of books that will be on reserve at the Taubman Medical Library to serve as background materials. These texts are:

*Protein Structure and Function.* (New Science Press), by Gregory A. Petsko and Dagmar Ringe.


*Genes VII* (Oxford University) by Benjamin Lewin

Literature Discussions:
An important extension of information and concepts learned from lectures is putting this information to work to understand and critically evaluate the primary literature. Our goal for the discussion sessions is to accomplish this level of understanding with respect to the areas covered in lectures. All students are expected to attend discussion sessions. Please contact Dr. Xu to sign up for one of the three discussion sessions (held at different times on the indicated dates). Papers (PDFs) from the primary literature will be available on the course website in advance of discussions. To prepare for participation in the discussion sessions, the primary papers and any accompanying reviews should be read in detail and understood with respect to underlying hypotheses, experimental approaches used, data obtained, interpretation of the data and conclusions and significance of the work. You should arrive in Discussions ready to discuss the papers. A short quiz will also be given at the beginning of each Discussion. Dates for discussions are indicated in the meeting schedule.

Discussion will be held on the indicated dates in Room 6311 Med Sci I at:
8 AM
10 AM
11 AM

Note—please replace furniture to original positions after discussions

Exams: There will be two exams of equal weight, in 5330 Med Sci I at the indicated times.

Grading:
The grading for this course will be based on two exams of equal weight (25% each) and quizzes + discussion participation (50%).