

Chem 224
Bioorganic Chemistry (Fall 2008)
T, Th 8:10 - 9:25
SC 1432

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I will maintain a web site for the class at:

<http://www.vanderbilt.edu/AnS/Chemistry/Rizzo/chem224/chem224.htm>

Tentative Course Content

- I. Amino Acids, Peptides and Proteins
 - A. Amino acid structure, synthesis and properties
 - B. Peptide and protein structure, synthesis and analysis
- II. Enzymes mechanisms
 - A. Catalytic sidechains
 - B. Cofactors
- III. Nucleosides, Nucleotides and Nucleic Acids
 - A. Nucleoside structure and synthesis
 - B. Oligonucleotide structure and synthesis
 - C. Nucleoside biosynthesis
 - D. Nucleosides and oligonucleotides as therapeutic agents and the target of therapeutic agents and carcinogens.

Prerequisite: Chem 220 a and b (Organic Chemistry) or the equivalent course.

Text: There is NO required text for this course. Exams and assignments will come entirely from class notes. The following books are recommended and available in the bookstore.

Chemical Approaches to the Synthesis of Peptides and Proteins, P. Lloyd-Williams, F. Albericio, E. Giralt, CRC Press, Boca Raton ,1997.

An Introduction to Enzyme and Coenzyme Chemistry (2nd ed), Tim Bugg, Blackwell Science, Oxford, 2004

Nucleic Acids in Chemistry and Biology (3rd ed), G. Michael Blackburn, Michael J. Gait, David Loakes, and David Williams, Royal Society of Chemistry Publishing, 2006

The following is an excellent review on peptide ligation and combinatorial chemistry and is highly recommended. You can download a pdf version free of charge from a computer with a Vanderbilt IP address.

"Synthesis of Native Proteins by Chemical Ligation" Dawson, P. E.; Kent, S. B. H. *Annu. Rev. Biochem.* **2000**, *69*, 923-960.

"Synthesis and Applications of Small Molecule Libraries." Thompson, L. A.; Ellman, J. A. *Chem. Rev.* **1996**, *96*, 555-600.

The following is an excellent resource on peptide mass spectrometry and is available as an ebook through ACORN:

"Introduction to Proteomics: Tools for the New Biology," Liebler, D. C., Human Press: **2002**

Tentative class schedule: see class web page

Exams: Each exam with count equally toward the final grade. Mid-term exams are scheduled for Sept. 25 and Oct. 30. The Final Exam is scheduled for Wed, Dec. 17 from 9:00 - 11:00 PM. No Alternate Final will be offered. Please make your travel plans accordingly.

Grading: Each exam with count equally toward the final grade. Graduate students are also required to write a short paper (10 page limit) on a topic of their choice (with approval from me), related to bioorganic chemistry. In addition, they will present a short lecture (15 minutes) on their topic. You should choose a topic by Oct. 30.

Office Hours: I will have open office hours. If you would like to see me, simply stop by my office. While this does not guarantee that I will be available, I will do everything possible to see you or make arrangements to meet at a mutually convenient time. Making an appointment to see may be most effective.