

Chem8360/Bio8360 Protein Structure and Function Fall Semester, 2014 (mini-semester I)

Instructors: Jenny J. Yang, NSC 552, jenny@gsu.edu, Jimmy Du zdu@gsu.edu
Guest Instructors: Bob Wohlhueter rwohlhueter@gsu.edu, Siming Wang swang@gsu.edu,
Ming Luo mluo@gsu.edu, Kathy K. Li kli10@gsu.edu
Textbook: (1) Instruction to Protein Structure, 2nd Edition by Carl Branden & John Tooze (2) Protein structure and Function, Gregory A Pesko and Dagmar Ringe (3) Handouts (lecture notes)
Time: Tuesday & Thursday 5:30pm-8:15 p.m.
Place: Aderhold Learning Center 323
Office Hours: 15 mins after the class. By Appointment.
Grade: 2 Midterms 60%, 2 Quizzes 40%, Oral Presentation 40%, Final Review Paper 60%. A 10-page double-spaced final review paper replaces the final exam. Paper review will follow the instruction for Authors for the Short Reviews for the Journal of Protein & Peptide Letters. Details and free examples can be found at <http://www.bentham.org/pp/MSandI.htm>. Bonus credits can be obtained by attending these related seminars, providing examples for the diseases, symptoms and treatments related to the topics covered in this course, actively participating in the discussion. Hands on computational experiences for protein modeling and visualization for frontier protein science research topics such as disease biomarkers, drug target and signaling modulators

Listed below is an approximate chronological schedule for the course:

Class	Date	Topics	Ch	Instructor
1	8/26*	Structure I – Basic Structural Principle Chemical Properties of Polypeptide Chain	1-3	Yang
2	8/28	Structure II – Motifs of Protein Structure Structure III – Domains, Tertiary Structure	4-5	Yang
3	9/2*	Quiz 1 / Techniques I – B Visualization of Protein Structure – Metal/ligand Binding and enzyme active Sites		Du
4	9/4	Non-covalent Interactions & Protein Stability		Yang
4	9/9*	Folding/misfolding / Techniques II: Protein Kinetics Techniques III: Structural Analysis: CD & Fluorescence,		Yang
5	9/11+	Techniques IV- /Protein Molecular Mechanics/drug discovery		Wohlhueter/Li
6	9/16*+	Midterm 1 /Techniques V: Protein interaction- Mass spectrometry		Wang
7	9/18+	Techniques V: Proteomics/Mass imaging – Mass Spectrometry/ Quiz 2		Wang
8	9/23*	Techniques VI: Protein-ligand interaction: Surface Plasmon Resonance, ITC, DSC		Li/ Wohlhueter
9	9/25	Membrane proteins, receptors, Biomarkers, drug targets		Zou/Yang
10	9/30*+	Techniques VII: NMR and its application		Du
11	10/2	Midterm 2 / Techniques VIII: X-ray and virus structure		Ming Luo
12	10/7*	Student Presentation: major cancer biomarkers/ signaling		Yang/Du
13	10/9	Student Presentation /sensor, imaging, targeting <i>Review Paper due</i>		Yang/Du

Attendance is mandatory. Bonus points and home work will be given during class and for attending seminars related to proteins

Suggested seminars for Chemistry department on Friday PSC101, 3:45, CDT seminar PSC124 Monday 1pm

Topics of oral and paper presentation and review

This year focuses will be diseases biomarkers such as , drug targets, and signaling modulators. Here are some examples.

- I. Membrane proteins, receptors, channels, gap junctions, GPCRs
- II. Major cancer surface biomarkers: CXCR4, HER2, PSMA, EGFR, immune biomarkers for T and B cells, viral proteins
- III. Sensors and imaging, targeting methods.

Detailed oral presentation, public speech skills and evaluation capability will be introduced. Students are asked to present oral presentation and write a review paper on the same topics you choose. Oral presentation will be 7-8 mins with carefully prepared PPT including structure features, key properties and functions of the protein/protein families and approaches used.

Instructions for Authors for the review paper

Letters Length: The published Letter, written in English, can be 10 pages.

Manuscript Organization: The manuscript should be typed in double spacing throughout on A-4 or US Letter (8.5x11 inches. All pages should be numbered. Abbreviations should be defined the first time they are used in the manuscript and a list of abbreviations used should also be provided.

The manuscript should be divided as: Title page, abstract and the main text. The text may be subdivided further according to the areas to be discussed. The Acknowledgements (if any) and Reference sections must then follow. The first page should contain the title, the author's names (initials and surname only), with an asterisk in front of the name of the principal (corresponding) author.

Abstract: The abstract should not exceed 250 words and it should condense the essential features of the letter article, with the focus on the major advances in the field.

Key Words: Authors must supply up to six key words along with their manuscript.

Font Times New Roman / Helvetica Size 10pt

Journal Reference:

Baily, J.M. and Shively, J.E. (1990) *Biochemistry*, 29, 3125.

Book Reference: Kalrai, R.D. Sanjay, A. and Mehta, N.G. (1993) *Biochem. J.*, 292, 163-170.

Book Chapter Reference: Bailey, J.M.; Shively, J.E. (1991) in *Techniques in Protein Chemistry II* (Villafranca, J. J., Ed). pp. 115-129. Academic Press Inc., New York.