

CHEM 4923: Senior Project

Fall 2015

The Structural Biology of Molecular Motors

Instructor:	Dr. Christina Bourne cbourne@ou.edu
Office:	SLSRC 2610
Office Hours:	Tues. / Thurs., 3:00 pm – 4:30 <i>Also available by appointment and by email</i>
Lecture:	M / W / F 12:30 pm – 1:20 pm, <u>PHSC 228</u>
Online Content:	learn.ou.edu

Course Description:

Topics of current interest and importance in chemistry or biochemistry, requiring in-depth reading or individual laboratory work, extensive literature search, and report writing.

Course Goals:

The course is designed to introduce students to structural biology, and to use this knowledge to understand the biochemistry and structures of biological motors that make life as we know it possible. Participation in every class is expected, and assigned work will include both computer and written assignments. Articles from relevant literature will be assigned and provided on the class d2l site.

Learning Outcomes:

At the completion of the course the student should be:

- able to identify secondary, tertiary and quaternary elements of structure for macromolecules (this includes proteins and nucleic acids)
- familiar with techniques used to determine these structures and specifically how we can know these structures are correct
- able to interactively display structures using graphical computer programs
- understand the components of any motor, and in particular how those are fulfilled in a biological setting
- compare and contrast the different types of molecular “motors”, and to an extent why they differ
- be able to deduce when “motors” are needed based on a given biological process

Schedule

The scheduled activities will be provided during the first class period.

Graded Items – updated Aug. 27, 2015

Participation in class	40 points
Molecular Origami (due 9/9/15)	15 points
FoldIt puzzles (completed by 11/6/15)	30 points
Movie / Presentation (due week of 11/30/15)	40 / 10 points
Written proteopedia report (due 11/6/15)	15 points
Final project- Proteopedia page (due 12/17/15)	50 points
	= 200 points total

~~Participation in class 40 points~~

~~Essay 1 10 points~~

Essay 2	20 points
Activity 1	10 points
Activity 2 / In-class presentation	25 points
In-class quizzes	20 points
Mid-Term Work / Exam	35 points
Final Exam (12/17/15, 1:30-3:30pm)	40 points
	= 200 points total

Course Grading Policy

A = 90 to 100% of points earned

B = 80 to 89%

C = 70 to 79%

D = 60 to 69%

F = below 60%

Academic Integrity

All students are expected to conform to college-level standards of ethics, academic integrity, and academic honesty. By enrolling in this course, you agree to be bound by the Academic Misconduct Code published in The University of Oklahoma Student Code (<http://studentconduct.ou.edu/>).

All members of the community recognize the necessity of being honest with themselves and with others. Cheating in class, plagiarizing, lying and employing other modes of deceit diminish the integrity of the educational experience. None of these should be used as a strategy to obtain a false sense of success. The need for honest relations among all members of the community is essential.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays. Schedule conflicts such as these should be brought to the instructor's attention at the beginning of the semester.

Reasonable Accommodation Policy

Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website <http://www.ou.edu/drc/home.html>.

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

PLEASE NOTE: The instructors reserve the right to change by addition and/or subtraction any and/or all materials contained in this syllabus.

ADDENDUM: Things I will assume you already know

The bases of nucleic acids and how they are linked

The amino acids of proteins and how they are linked

The biochemical processes covered in Principles of Biochemistry, including basic enzyme function, transition state theory, and thermodynamics