

## **CHEM 520B: ADVANCED CHEMICAL BIOLOGY**

**Units:** 2

**Semester:** Spring 2020

**Days:** 1 h 20 min Tues 9:30-10:50 am

**Location:** TRF Conference Room

### **Instructor:**

Matthew Pratt

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Office Hours: 1 - 2 pm, M

### **Course Description:**

CHEM 520B: Advanced Chemical Biology is designed for graduate students and advanced undergraduates who are interested in chemical biology, enzyme inhibitors, and posttranslational modifications. This chemistry course will provide students with a solid understanding of the modern techniques in protein chemistry and analysis, the fundamental concepts in enzymology and enzyme inhibitors, and chemical techniques to investigate protein posttranslational modifications. The course will be taught in two modules, starting with concepts in enzymology, including modes of enzyme inhibition. This will lead to a description of types of small molecule inhibitors (substrate and transition-state inhibitors, activity-based probes, etc.) The class will then cover the major types of posttranslational modifications and chemical methods for their identification and analysis. Overall, CHEM 520B will provide students with a firm foundation in the techniques, theories, and methods to investigate protein biochemistry and posttranslational modifications in their own projects and critically interpret the work of other scientists in the field.

### **Learning Objectives:**

Students will be asked to demonstrate verbal and written comprehension of the concepts in chemistry, biochemistry, and cell biology that are pertinent to the overall theme of the course. Students will be expected to take the concepts presented to them in lecture and apply that knowledge to similar but different situations on exams. They will solve problems requiring the development of skills in such specific areas as organic chemistry, statistics, enzyme inhibition kinetics, derivation of mathematic equations, etc.

**Prerequisite(s):** CHEM 520a

**Co-Requisite(s):** None

**Concurrent Enrollment:** None

**Recommended Preparation:** CHEM 322a & b: Organic Chemistry and BISC 330 (or equivalent)

### **Materials**

Class Materials will be available through email and/or Dropbox as needed throughout the semester.

### **Required Readings and Supplementary Materials**

None

### **Assignments and Exams**

Grades will be calculated based on exams, problem sets, and a presentation.

**Problem Sets:** Two problem sets will be assigned during the semester consisting of long-form answers based on material presented in lecture. These homework assignments will be due two-weeks after they are assigned. *No late homework assignments will be accepted.*

**Seminar Attendance:** You will be required to attend the Chemical Biology Seminar Series (Select Thursdays 12:30 - 1:30 pm in the TRF Conference Room). These are worth 10 points each for just showing up. The seminar dates for Spring 2020 are: 2/6, 2/20, 3/5, 3/12, 4/2, 4/9 & 4/23. If you have another class at these times, you will be excused from this portion of the class.

**Presentation:** Each week one a student will present (10 to 15 min) a publication from the literature that highlights the concepts for the lectures. Each student will be responsible for the presentation of one paper that will be assigned by the professor.

**Make-up Assignments:** An excused absence from an exam will be granted by the instructor only on the basis of proper documentation. For example, a second missed exam because of serious medical reasons will be excused only if a certification is provided by a physician.

**Contesting Grades:** Mistakes can be made during the grading process, and students will have the opportunity to contest grades; however, there is an explicit policy for doing so. A grade on an individual Exam or Assignment must be contested within two weeks of receiving the grade. *There will be no exceptions.*

### Grading Breakdown

There will be two exams (100 points each) and presentation of a publication from the literature (50 points).

Exams	200 points
Problem sets	100 points
Seminar attendance	70 points
Presentation	50 points

**Total**                      **420 points**

## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*  
[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298*  
[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy,

veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symlicity.com/care\\_report](https://usc-advocate.symlicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](https://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/ notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*Campus Support & Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.