

Syllabus BIBC 194/BGGN 280
Advanced Topics in Biochemistry:
Mechanistic Cell Biology
Spring 2024

Time:	Friday, 10:30 – 11:50 AM
Place:	York Hall 3010
Instructor:	Dr. Andreas Ernst Cell & Developmental Biology 4218 Bonner Hall Phone: (858) 246-4768 email: aernst@ucsd.edu
Office Hours:	Zoom ID: 977 1219 7010, Fr 1-3 PM
Class Web Site:	https://canvas.ucsd.edu/courses/54552
Prerequisites:	BIBC 100 or 102/CHEM 114A or 114B
Course Description:	<u>What is Mechanistic Cell biology?</u> <i>“Biologists study the transfer of information at many levels. Biochemists have traditionally investigated the structure and function of individual components of the cell to understand the mechanisms underlying biological transformations, e.g., enzymatic modifications of small molecules and macromolecules, the transformation of genetic information into the sequence of an RNA or a protein, and the transduction of signals through molecular interactions. Cell biologists have investigated the organization of cells, the molecular mechanisms of cellular activities, the regulation of cellular processes by cues from the extracellular environment, and</i>

*the assembly of cells into tissues. Recent advances in microscopy have **facilitated an effective convergence of biochemistry and cell biology** — we can visualize molecules and cells, and individual molecules within cells, in real time. Thus, we can study spatial organization and dynamic changes in organization on various distance and time scales—enzymatic reactions, protein associations, signal relays, organelle function, cellular translocations, and many other molecular processes. It is no surprise that spatial organization matters, but we can now follow it directly—from the in vitro behavior of single molecular assemblies to changes in gene expression at any one time within a single cell.” (Harrison & Brugge, Mol Biol Cell 2010)*

- We will discuss **recent publications from UCSD faculty** who perform research in the field of ‘*Mechanistic Cell Biology*’.
- The goal for this course is to learn how to critically read and interpret primary literature, and to gain an overview of state-of-the art methods employed in current research at UCSD.
- Each week, a group of 3-5 students will present a **60-minute seminar** (45 min for a slideshow presentation, 15 minutes for Q & A – please practice your presentation in order not to exceed the time limit). *The group and paper assignments are posted on Canvas.* Please prepare a combined slideshow for your group and present it from one laptop. **All members of the group must contribute to the presentation of the material.** Also, please make sure to email your presentation to Dr. Ernst before the class.

- ***All students in the audience must have read the paper, even if they are not presenting!***

Presentation guidelines & grading rubric:

The following components should be part of your presentation of the publication. Each group member is awarded the same number of points, **90 points max.**

<i>Introduction</i>	(10 pts)	Please provide relevant background that a) puts the work in context, b) describes what problem it is trying to solve, and c) address whether this is building off previous work. It might be necessary to gather information from sources outside the publication (review articles, etc.) for the audience to understand the setting of the study.
<i>Results</i>	(30 pts)	For each main figure/table, please describe a) the experimental condition (including the methods used), b) which result was obtained, and c) what the authors conclude from the data. Since modern manuscripts are cluttered with multiple display items in figures, it is acceptable to focus on the results that mainly support the authors' conclusions.
<i>Discussion</i>	(10 pts)	Please describe the publication's significance, with focus on a) how it advances the field, b) any potential limitations of the study, and c) appropriate future directions and experiments.
<i>Slides</i>	(15 pts)	Points awarded for the effort taken in designing clear, legible, and well-composed presentation slides.
<i>Delivery</i>	(15 pts)	Points awarded for a) a logical organization of the presentation, and b) an articulate presentation style.

Q&A (10 pts) Points awarded for encouraging an active discussion with your audience.

Class attendance will be awarded with 1 point per week, **10 points max**.

Final grade

Your final grade will consist of the presentation points (90 pts max) and attendance points (10 pts max):

100 – 90	pts	=	A
89 – 77	pts	=	B
76 – 67	pts	=	C
66 – 57	pts	=	D
50 – 0	pts	=	F

Tentative Seminar Schedule *(please check Canvas to see which group you are in):*

<u>Week</u>	<u>Date</u>	<u>TOPIC</u>	<u>GROUP</u>
1	05-Apr	Introduction	
2	12-Apr	<i>Corbett Lab</i> publication	1
3	19-Apr	<i>Villa Lab</i> publication	2
4	26-Apr	<i>Desai/Oegema Lab</i> publication	3
5	03-May	<i>Neal Lab</i> publication	4
6	10-May	<i>Hui Lab</i> publication	5
7	17-May	<i>Leschziner/Reck-Peterson Lab</i> publication	6
8	24-May	<i>Novick/Ferro-Novick Lab</i> publication	7
9	31-May	<i>Cleveland Lab</i> publication	8
10	07-Jun	<i>Wilhelm Lab</i> publication	9

Student Resources: [Accessibility](#)

Students requesting accommodations for this course due to a disability must provide a current Authorization for

Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD, located in University Center 202 behind Center Hall). Students are required to present their AFA letters to Faculty and to the OSD Liaison in the department in advance so that accommodations may be arranged. Contact the OSD for further information: <https://disabilities.ucsd.edu/>.

Inclusion

I am committed to creating a learning environment that supports diversity of thought, perspective, experience, and identity. This is important, because key discoveries and significant progress in science requires addressing research questions from as many perspectives as possible. Please share your ideas on how to further promote inclusion with the Office of Equity, Diversity, and Inclusion: diversity@ucsd.edu; <https://diversity.ucsd.edu/>

Basic Needs

If food insecurities or a lack of a safe and stable place to live affect your learning, please contact: foodpantry@ucsd.edu | basicneeds@ucsd.edu

UC San Diego Academic policies

Principles of Community:

<https://ucsd.edu/about/principles.html>

Student Conduct Code:

<https://students.ucsd.edu/files/student-conduct/ucsandiego-student-conduct-code-interim-revisions1-16-18.pdf>

Religious Accommodations:

<https://senate.ucsd.edu/operating-procedures/educational-policies/courses/epc-policies-on-courses/policy-exams->

[including-midterms-final-exams-and-religious-accommodations-for-exams/](#)

Community Centers:

<https://students.ucsd.edu/student-life/diversity/index.html>

Counseling and Psychological Services (CAPS):

<https://caps.ucsd.edu/>

Office for the Prevention of Harassment & Discrimination (OPHD): <https://ophd.ucsd.edu/report-bias/index.html>

Subject to

Change Policy:

The information provided in this syllabus (with the exception of grading and absence policies) may be subject to change with reasonable advance notice, e.g. if required to meet student needs and/or to enhance student learning.