

Welcome to BIMM110: Molecular Basis of Human Disease!

*Dear BIMM110 students, the syllabus below is a draft, so there will be some minor changes

Week	Monday lecture	Wednesday lecture	Wednesday section	Friday lecture
0	–	–	No section	Getting to know the instructor, IA's, your peers
1	Oct 2 Cystic fibrosis (CF): from mutation to disease Read: Atul Gawande "Better" Ch. 1 (posted on Canvas). <i>Post reflection on Canvas</i>	Oct 4 Mutations in CF and drugs to treat them Watch videos (posted on Canvas) <i>Take Canvas quiz</i>	Oct 4 Drop in to get to know your IA's and get your questions answered!	Oct 6 Small molecule modulator drugs. Interpreting data. Taylor-Cousar et al., Lancet 2023
2	Oct 9 Modulator and gene therapies (CRISPR?) Unresolved challenges in CF	Oct 11 Covid: mechanisms of infections and stages of viral replication <i>Optional (participation): Post questions you would like to get answered about Cystic fibrosis on Canvas by end of the day</i>	Oct 11 Problem set 1 (CF) discussed	Oct 13 Covid: mechanisms of vaccines. How do we know if vaccines are safe and effective? Watch: Hazard ratio video, read description of stages of clinical trials. <i>Submit Canvas quiz before class</i> <i>Problem set 1 due by Sun 11:59PM</i>
3	Oct 16 Covid: stages of viral replication, stages of the disease, and the drugs that can target them.	Oct 18 Covid: development of a small molecule therapy (<i>skim Owen et al., 2021 with the emphasis on the Canvas quiz questions (don't worry about the data in this paper yet)</i>), Optional: watch video introducing this paper <i>Submit Canvas quiz before class</i>	Oct 18 Problem set 2 (Covid) discussed	Oct 20 <i>Before class: submit our questions about Covid.</i> Owen et al., 2021 and Covid wrap up Maybe: are we ready for the next pandemic? <i>Problem set 2 due by Sun 11:59PM</i>
4	Oct 23 Midterm 1 (covering weeks 1, 2, and 3)	Oct 25 Cancer: examining Chronic Myeloid	Oct 25 No section	Oct 27 Cancer treatments. Read Braun et al.,

		Leukemia and its treatments		2020 Response and Resistance to BCR-ABL1-Targeted Therapies
5	Oct 30 Synthetic lethality as a promising approach to treating cancer. Read Huang et al., 2020. <i>Submit Canvas quiz</i>	Nov 1 Example of synthetic lethality drug development: read Gallo et al., 2022 (Part 1). <i>Take Canvas quiz</i>	Nov 1 Problem set 3: CML, small molecule tyrosine kinase inhibitors, BCR-ABL 1	Nov 3 Example of synthetic lethality drug development: read Gallo et al., 2022 (Part 2). <i>Problem set 3 due by Sun 11:59PM</i>
6	Nov 6 Diabetes, insulin secretion and insulin pathway	Nov 8 Type 2 Diabetes, insulin: beta cells disfunction (Guest speaker?)	Nov 8 Review: Cancer	Nov 10 No class: Veteran's Day
7	Nov 13 Type 2 Diabetes: mechanisms, Perry et al., 2015 and take Canvas quiz	Nov 15 Paper discussion Perry et al., 2015 <i>Problem set 4 due by Wed 11:59PM</i>	Nov 15 Problem set 4: Diabetes	Nov. 17 Midterm 2
8	Nov. 20 Mystery disease activity	Nov 22 Mystery disease, part 2	Nov 22 No section	Nov 24 No class: Thanksgiving!
9	Nov 27 Neurodegenerative diseases. Read Holtzman et al (2011) <i>Alzheimer's Disease: The Challenge of the Second Century</i> (pp. 1-4) and take Canvas quiz	Nov 29 Alzheimer's disease: molecular mechanisms. Read Paper APP/tau-/- and take Canvas quiz	Nov 29 Review: how to analyze Midterms 1 and 2 and succeed on the Final	Dec 1 Studying Alzheimer's disease in mice. Paper APP/tau-/- discussed in detail
10	Dec 4 Alzheimer's disease, Future directions. way forward. Paper Kosik (2020) "The way forward". <i>Submit Canvas reflection.</i>	Dec 6 Review: concepts	Dec 6 Problem set 5 is discussed	Dec 8 Review: papers <i>Problem set 5 due by Sun 11:59PM</i>

COURSE GOALS:

1. Learn about the molecular mechanisms and the available/emerging treatments of several representative human diseases
2. Become better readers of scientific papers: understand them, evaluate scientific evidence presenting in them, identify questions that remain to be answered, and possible ways to answer them

3. Develop understanding of some of the techniques used in molecular biology and biomedical sciences
4. Become more comfortable working in a team
5. Become better in communicating scientific ideas orally and in writing

LEARNING OBJECTIVES:

AT THE END OF THIS COURSE, YOU SHOULD BE ABLE TO:

1. Explain the current understanding and the available treatments of several representative human diseases
2. Demonstrate understanding of scientific papers we will read in this course
3. Demonstrate ability to interpret data similar to the data presented in these papers
4. Demonstrate understanding of the techniques we will learn about and the ability to design experiments using these techniques
5. Demonstrate ability to communicate your ideas in writing in exams and orally, in class and in discussion sections
6. Demonstrate ability to work productively as a team

LECTURES:

MWF 2:00pm-2:50am Ledden Hall

DISCUSSION SECTION:

Wed, 4-4:50pm on Zoom. Zoom link will be posted on Canvas. Discussion section will be recorded. They are not mandatory, but this is where problem sets will be discussed and questions will be answered. We highly recommend attending them, to enhance your learning.

OFFICE HOURS:

DR. TOUR: TBA

I will do my best responding to emails that require short answers (unfortunately, I get over a hundred of email each day and my reply may be delayed). For questions that require explanations or urgent answers, please see me in my office hours or right after class – I am more than happy to answer your questions then.

IA'S:

Name	<u>Email contact</u>	<u>Office hours</u>
Long, Laura Marie	lm1long@ucsd.edu	
Mukundan, Niles	nmukunda@ucsd.edu	
Singh, prab	p5singh@ucsd.edu	
Xu, Cindy	cixu@ucsd.edu	

HOW THIS COURSE WILL BE TAUGHT?

This is a hybrid class: learn the basics before lecture, so we can get to advanced material in class. Sections are very important part of this course: this is where you will test your learning by solving problems and explaining the material to your group. Discussion sections are optional, but strongly

recommended: problem sets due that week will be discussed there. All lecture slides will be posted on the website and are available for download after class. The lectures will be also videocasted,

TEXTBOOK There is no required course textbook. Instead, we will use review articles, original research papers, and reliable websites.

REQUIRED MATERIALS: iClickers -please read carefully the information below, because we will be using Clicker Cloud, which is a bit different from they way you may have been using them so far. If you have a remote clicker device, you can still use it, but you will need to register your remote on iClicker website, as shown below:

All students must [create iClicker Student accounts](#). If students are using physical remotes, they must follow these instructions after they create their accounts: [Register remote IDs in iClicker](#)

Students using remotes do not need to purchase a subscription if they do not want to use the app. However, students using the app must [purchase a subscription](#).

GRADING

The grades in this course will not be curved. Overall course letter grades will be assigned using the following scheme:

97-100	A+	76.75-79.74	C+
92.75-96.75	A	72.75-76.74	C
89.75-92.74	A-	66 -72.74	C-
86.75-89.74	B+	59.75-65.75	D
82.75-86.74	B	0-59.74	F
79.75-82.74	B-		

Grades will be determined as follows:

- Midterms: 15% each, 30% total. If your final exam grade is higher than either one of the midterms, it will replace the midterm grade/s.
- Final exam (cumulative, all material covered): 50%
- Homework 10%. Submit 85% of all the homework assignments to receive an A (95%) in this category. Most of the homework will be graded as follows: 2 pts = correct and complete, 1 = incorrect or incomplete, 0 = incorrect and incomplete or absent
- Participation 10%. This will include iClicker questions, participation reflections posted on Canvas, in class group work (possibly also discussion section participation – TBA).

Accumulate 85% of the total available participation points to receive an A (95%) in this category.

- Extra credit: surveys up to 0.5%, opportunities will be announced.

Make ups of exams and homework: All exams will be in person. You can miss one of the Midterms – and have those points come from your final exam. However, I strongly recommend taking the midterm, because it's a great low-stress practice. Since it takes several days to write an exam, in most cases I will not be able to offer make-up exams, however, please speak to me if you have a conflict or a medical/family emergency and we will see what can be done. Please check your schedule and make sure that you are available on the date of the final exam. If you have a conflict with the final exam in another class, please drop this or the other class. If you are having a family or medical emergency during the final exam, please provide documentation (e.g., emergency room paperwork) and contact me as soon as you can. Homeworks: there are no make ups or extensions of homeworks (except in cases of documented illness or emergency), but please remember that you need to accumulate only 85% of the homework points to get an A in this category.

STUDENTS WITH DISABILITIES Reasonable accommodations will be provided for qualified students with disabilities. If you have any disability that may impair your ability to complete the course successfully, please do not hesitate to contact me during the first week of the course!

ACADEMIC INTEGRITY

We take academic integrity very seriously. Cheating undermines honest effort and hard work by other students. It will not be tolerated. Cheating on exam, submitting someone else's work as your own, clicking in for another student, copying all or parts of someone else section paper are all examples of academic dishonesty. Please talk to the instructor or the IA immediately if you learn of any incidents of academic dishonesty

UCSD Policy of Academic Integrity, student's responsibilities:

Students are expected to complete the course in compliance with the instructor's standards. No student shall engage in an activity that involves attempting to receive a grade by means other than honest effort; for example:

- No student shall knowingly procure, provide, or accept any unauthorized material that contains questions or answers to any examination or assignment that is being, or will be, administered.
- No student shall complete, in part or in total, any examination or assignment for another person. This also includes asking someone else to do the iClicker voting for you. In this case, both students will be reported to the Academic Integrity office.
- No student shall knowingly allow any examination or assignment to be completed, in part or in whole, for himself or herself by another person.
- No student shall plagiarize or copy the work of another person and submit it as his or her own work.
- No student shall employ aids excluded by the instructor in undertaking course work or in completing any exam or assignment.

- No student shall alter graded class assignments or examinations and then resubmit them for regrading.
- No student shall submit substantially the same material in more than one course without prior authorization.

Completing paper assignments: using sentences from scientific papers and websites is plagiarism (this includes copying and pasting sentences and changing a few words in them). Paper assignments will be submitted to Turnitin. If plagiarism is detected, your assignment will receive an automatic 0 (no exceptions). To avoid plagiarism, be sure to first understand what you are about to write. Then write in your own words. If you do so, your text will not be similar to authors' text. If you are having difficulties with writing based on scientific articles, please talk to the IAs or to me.

Consequences of cheating:

Cases of cheating will be reported to the Office of Academic Integrity, who will forward them to the Dean of the student's college. In addition, the grade for the assignment in which the cheating occurred will be an 'F'. Cheating on exam will result in 'F' in the course, as well as in administrative consequences. To learn more, please read:

<https://students.ucsd.edu/academics/academic-integrity/consequences.html>

HOW TO SUCCEED IN THIS CLASS

- ❖ Do the assigned reading. Serious engagement with the material before class will lead to significantly higher gains in class
- ❖ Be proactive, reach out and get help! If you are having troubles with any part of the course material, talk to me or the IA and come to our office hours. Please don't wait! We care about the success of each and every student and we want to help.
- ❖ Critical thinking is hard. Work with your group or form a study team, and put your collective intelligence to work. Come to my and IA's office hours (and sections) and ask questions. Don't be discouraged if you don't understand everything: you are here to learn.
- ❖ Plan ahead. If you anticipate that you'll need help with homework or with exam prep, allow yourself enough time to attend office hours and get your questions answered. I or the IA will not be able to answer last minute questions emailed to us few hours before exam. To get best help, see us in person.
- ❖ Attend classes and sections. Do the section and in class activities. It takes time to build up knowledge and skills, don't leave it to the last minute. Cramming the night before the exam will not work in this class.

Good luck! We want all of you to succeed!