

BIMM110

Molecular Basis of Human Disease

Spring quarter, 2022

Last Updated [March 28, 2022]

Important Note: This syllabus, along with course assignments and due dates, are subject to change. It is the student's responsibility to check Canvas for corrections or updates to the syllabus. Any changes will be clearly noted in a course announcement or through email.

Course Overview

Welcome to BIMM110, Molecular Basis of Human Diseases. It has been hard to cope with over a year long pandemic. But, now, the end is insight with Covid-19 vaccine. While you are vaccinated, BIMM110 this year will be given fully online throughout the spring quarter. Since most of you have been taking on-line courses over a year, you are much more familiar with zoom lectures, office hours, and exams. We will briefly go over the logistics of this course during the first lecture before we are , the first hour getting everybody situated so that we can all participate online.

Once we get started with the materials, we have a lot of interesting things to cover. This course will discuss 1) Genetic, biochemical, and molecular biological approaches used to identify the molecular basis of human diseases; 2) current understanding of selected major human diseases at the molecular and cellular levels; 3) successful and possible therapeutic treatments of these diseases. It is expected that students who take BIMM 110 already have a good background in molecular biology, metabolic biochemistry, and genetics.

Course Objectives:

Cells in our body are doing amazing jobs to conduct all the processes that you have learned so far in Molecular Biology, Cell Biology, Structural Biology, Metabolic Biochemistry, and Neuroscience classes and even more, to sustain life. Over the last centuries, tremendous advances have been made to understand how each individual event occurs accurately, coordinately, properly, and timely manner. Researches in biology and medicine have made incredible progress over the past 50 years and sequence the entire human genome became a realistic tool for identification or diagnosis of diseases.

We are now in the era that the length of time that takes to translate basic research in molecular biology into development of new drugs and more effective treatments has been and will continue to be shortened. At the same time, we have witnessed tremendous growth in pharmacological and biotechnology industries over the past decades.

In this class, you will review how cellular processes coordinate with each other to sustain life and learn what happens if a specific process or cellular mechanisms fail to occur properly. As we progress more understanding of molecular mechanisms of cellular processes, we hope you to see how scientists can unveil mysteries of currently untreatable diseases or provide understanding for illness that lack information.

Instructional Team

Instructor

Maho Niwa, Ph.D.
Professor
Division of Biological Sciences,
mniwarosen@ucsd.edu

Lectures: Tues/Thurs. 11:00-12:20 pm
Office Hours: Thursday at 6:00-6:50pm

Instruction Assistants

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|--------------|--|
| Dustin Pwee | dpwee@ucsd.edu |
| Jeremy Stark | jpstark@ucsd.edu |
| Astoria Yang | hay001@ucsd.edu |

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|-------------------------|---|---------------|------------|--------------|
| <u>Sections:</u> | Below are the scheduled online sections. Further details will be announced. | | | |
| #1 A01 | Monday | 8:00-8:50: am | RCLAS R44 | Jeremy Stark |
| #2 A02 | Monday | 3:00-3:50 am | RCLAS R117 | Justin Pwee |
| #3 A03 | Monday | 5:00-5:50 am | RCLAS R177 | Astoria Yang |
| #4 A04 | Monday | 6:00-6:50 am | RCLAS R150 | |
| #5 A05 | Tuesday | 2:00-2:50 am | RCLAS R210 | Jeremy Stark |
| #6 A06 | Wednesday | 1:00-1:50 am | RCLAS R110 | Justin Pwee |

In Spring 2022, all instruction of this course will be conducted in a remote format. In general, this means the class will include a series of real-time and recorded sessions, in addition to learning activities and opportunities to connect with the instructional team and other students. Just as with a regular course, it is expected that you will spend 12 hours per week on this course. In a remote environment, this time will be consumed in a variety of tasks per week.

Course Policies

Classroom conduct: While all the course materials will be offered on-line rather than in the classroom setting, general policies remain the same. Please refrain from all unnecessary use of electronics, side conversations, and multi-tasking including eating, newspaper reading during the live sessions. Please turn off your cell phones in the classroom and be respectful of classmates. You are invited to participate in creating an environment of mutual respect and intellectual productivity by listening and speaking with an open mind.

Make up exams and lateness: A student may not take a make-up test unless she/he has an excused absence. Excused absences are given only with presentation of a valid medical or emergency excuse (for self or family member) in writing with medical doctor's note. Any other failure to take an exam when it is scheduled will result in no credit for the exam. There are absolutely no makeups for the final exam unless you meet the conditions set out in the undergraduate handbook.

Accommodations: Anyone in need of classroom or exam accommodations for a disability is encouraged to contact the Office for Students with Disabilities and should inform me as soon as possible.

Academic integrity: Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating, or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result in sanctions. Sanctions can include an F in the class and suspension or dismissal from the University. So, think carefully before you act. Before you act, ask yourself the following questions: a) is my action honest, fair, respectful, responsible, and trustworthy, and b) is my action authorized by the instructor? If you are unsure, don't ask a friend, ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at academicintegrity.ucsd.edu. (Source: Bertram Gallant, T. (2017). *Teaching for integrity*. UC San Diego Academic Integrity Office.)

Absolutely no cheating will be tolerated. All suspicions of integrity violation will be reported to the Academic Integrity Office according to university policy. The Policy on Integrity of Scholarship (academicintegrity.ucsd.edu) list some of the standards by which you are expected to complete your academic work, but your good ethical judgment (or asking me for advice) is also expected as we cannot list every behavior that is unethical or not in the spirit of academic integrity.

Those students found to have committed academic misconduct will face administrative sanctions imposed by their college Dean of Student Affairs and academic sanctions imposed by me. Students can also face suspension and dismissal from the University; those sanctions are not at my discretion. Academic sanctions can range from an F on the assignment to an F in the class. The appropriate sanctions are determined by the egregiousness of the Policy violation. Students who assist in or are complicit with cheating could also be in violation of the Policy. Thus, students who become aware of their peers either facilitating academic misconduct or committing it should report their suspicions to me for investigation.

For further information:

https://academicintegrity.ucsd.edu/index_old.html

Communication Guidelines

As we move through the quarter, you might have questions about the course structure, content, or general inquiries for the instructional team.

If the question is related to course structure, please be sure to read the syllabus and look through the course on Canvas before asking the instructional team. If you have a general course question (e.g., not confidential or personal in nature), please post it to the discussion site. We will announce the name of the discussion in the Canvas course site. I or one of the IAs will post answers to all general questions there (typically within 1 business day), so all students can access the response. You are also encouraged to answer each others' questions as well.

For all other questions, please contact me directly via email. Please be sure to include a descriptive subject, with [BIMM110] at the front of the subject (e.g. [BIMM110] Request for

individual meeting). As this is not a small course, I will respond to your inquiries, first come first serve bases, and typically within 1-2 business day.

Netiquette

Netiquette is a set of rules for behaving properly online. Your instructor and fellow students wish to foster a safe online learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea but you are not to attack an individual. Working as a community of learners, we can build a polite and respectful course community. The following netiquette tips will enhance the learning experience for everyone in the course:

- Do not dominate any discussion.
- Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
- Popular emoticons such as ☺ or / can be helpful to convey your tone but do not overdo or overuse them.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation.
- Never make fun of someone's ability to read or write.
- Share tips with other students.
- Keep an "open-mind" and be willing to express even your minority opinion. Minority opinions have to be respected.
- Think and edit before you push the "Send" button.
- Do not hesitate to ask for feedback.
- Using humor is acceptable

Adapted from:

Mintu-Wimsatt, A., Kernek, C., & Lozada, H. R. (2010). *Netiquette: Make it part of your syllabus*. *Journal of Online Learning and Teaching*, 6(1). Retrieved from http://jolt.merlot.org/vol6no1/mintu-wimsatt_0310.htm

Textbook, Course Materials & Technology

All the Zoom lectures will be recorded and recording will be posted on UCSD Canvas within 48 hrs after the lecture. In addition, lecture notes will be posted on UCSD Canvas. Students will read primary research papers prior to attending some of the sections and papers will be posted on UCSD Canvas ahead of time.

Canvas

Our course will be hosted on the Canvas learning management system (<https://canvas.ucsd.edu>). Once you login with your UC San Diego username and password, you will be able to access additional course materials, scheduled sessions, opportunities for interaction and more.

Tip: You can download the Canvas Mobile App and connect to "UC San Diego" to access your courses on your Android or iOS device: <https://community.canvaslms.com/docs/DOC-4048>

Zoom

Our course will make use of Zoom for lectures, office hours, course sections and review sessions. Learn more and download the Zoom Client for Meetings, and/or the Zoom Mobile Apps at <https://ucsd.zoom.us/>

Course Technology Requirements

To participate in this course, you will need the following:

- A laptop or desktop with a current operating system and internet access
- You will also need access to the following tools to fully participate in this course:
 - Webcam (for video conferencing through Zoom)
 - Microphone (for audio conferencing through Zoom)
 - A stable internet
 - Current browser

Grading Information

This course will have total of three exams, two midterm exams and a final exam. The midterm exams will be given during the normal lecture time, while the final exam will be held on **June 7, 2022 (Tuesday) 11:30 am-2:29 pm**. All the students enrolled in this course are expected that you are able to attend all the lectures on the specified date/time designated by the University. However, a situation that is out of your control and unables you to take the exam during the designated lecture time could arise. Under such circumstances, you are required to contact professor Niwa to make a specific arrangement ahead of time. An inability to take any exams for any reasons except those addressed above will not warrant requests for make up exams.

All the exams will be closed book/closed computer/electronic devices except accessing the exam questions on-line. Questions will be derived from lectures and assigned papers to test the understanding of the materials.

Scoring Breakdown

| | |
|---|-------------------------|
| Midterm Exam (May 3, 2022, 11:00 am-12:20 pm) | 30% of the final grade |
| Final Exam (June 7, 2022, 11:30 am- 2:29 pm) | 45% of the final grade |
| Quiz, Discussion, and Class Participation | 25 % of the final grade |

Policy on Late or Missing Work

Be sure to pay close attention to deadlines – there will be no make-up assignments or quizzes, or late work accepted without a serious and compelling reason and instructor approval.

Grading Scale

| | | | | |
|------------------------|----------------------|----------|----------|-----------|
| A (A+, A, A-) | B (B+, B, B-) | C | D | F |
| 90-100% | 75-89% | 55-74% | 45-54% | 44%-below |
| (A+ 97-100% (B+ 82-89% | | | | |
| A 92-96% | B 78-81% | | | |
| A- 90-91%) | B 75-77%) | | | |

Pass/No Pass Option

We are no longer operating with the Academic Senate temporal guidelines implemented during the pandemic years of 2020 and 2021 academic years.

Students can request P/NP according to the previously published Academic rules prior to the past two Covid19 pandemic years (2020 and 2021). If you have any questions, you should contact Advising through the Virtual Advising Center ([https://biology.ucsd.edu/education/undergrad/advising/index.html#Virtual-Advising-Center-\(VAC\)\)](https://biology.ucsd.edu/education/undergrad/advising/index.html#Virtual-Advising-Center-(VAC))))

Please review information in its entirety as grading options and the add/drop/change to grading option deadlines for SP22 have been adjusted.

Student inquiries related to major requirements can be directed to Biology Advising through the Virtual Advising Center ([https://biology.ucsd.edu/education/undergrad/advising/index.html#Virtual-Advising-Center-\(VAC\)\)](https://biology.ucsd.edu/education/undergrad/advising/index.html#Virtual-Advising-Center-(VAC))))

Schedule:

Week 1

March 29, Lecture 1: Logistics & Human Disease History and Today
March 31, Lecture 2: Down Syndrome

Week 2

April 5, Lecture 3: Robertsonian Translocation/Q&A
April 7, Lecture 4: Hemophilia

Week 3

April 12, Lecture 5: Cystic Fibrosis
April 14, Lecture 6: Anthrax, Discussion

Week 4

April 19, Lecture 7: Cholera
April 21, Lecture 8: Coronavirus

Week 5

April 26, Lecture 9: Covid-19 & Vaccine, Public Health (Arturo Chavez)
April 28, Lecture 10: Discussion Q/A

Week 6

May 3, Midterm Exam Midterm Exam (in class)
May 5, Lecture 11: Flu Viruses (Dr. Seema Lakdawala)

Week 7

May 10, Lecture 12: Diabetes/Obesity (Dr. Luke Wiseman)
May 12, Lecture 13: Discussion Q/A, Molecular Mechanisms of Cancer

Week 8

May 17, Lecture 14: Translational Research on Liver Fibrosis and Liver Cancer
(Dr. Dabanjan Dhal)
May 19, Lecture 15: Epigenetic diseases, X-inactivation

Week 9

May 24, Lecture 16: Neurodegenerative Disease 1: Alzheimer Disease
May 26, Lecture 17: Neurodegenerative Disease 2: Huntington, Parkinson

Week 10

May 31, Lecture 18: Multiple Myeloma (Dr. Leslie Crews)
June 2, Lecture 19: Current Topic

June 7, 11:30 am-2:29 pm Final exam

Student Resources

Academic Support

UC San Diego Library

- Ask a Librarian: <https://library.ucsd.edu/ask-us/>
- Library Help: <https://library.ucsd.edu/ask-us/triton-ed.html>

Teaching + Learning Commons

- Writing Hub: <https://writinghub.ucsd.edu/>
Improve writing skills and connect with a peer writing mentor
- Academic Achievement Hub: <https://aah.ucsd.edu/>
Supplemental instruction, content tutoring and learning strategy tutoring

Office of Academic Support & Instructional Services (OASIS): <https://oasis.ucsd.edu/>

Intellectual and personal development support

Student Success Coaching Program: <https://successcoaching.ucsd.edu/>

Peer mentor program that includes information, resources, and support in meeting your goals

Additional Student Resources for Your Personal Well-Being

The Hub Basic Needs

The Hub addresses basic needs insecurities you might face. They provide necessary resources, break stigma surrounding basic needs, and foster a sense of belonging for every student. The Hub builds community to help one another.

<https://basicneeds.ucsd.edu/> | basicneeds@ucsd.edu | (858) 246-2632

Counseling and Psychological Services (CAPS)

Services and programs that enhance the college experience, promote academic success, and help you develop effective coping skills.

<https://wellness.ucsd.edu/caps/> | (858) 534-3755

CARE at the Sexual Assault Resource Center

<https://care.ucsd.edu> | sarc@ucsd.edu | (858) 534-5793

Office for the Prevention of Harassment & Discrimination (for Students)

https://ophd.ucsd.edu/policies-procedures/polpro_student.html

Undocumented Student Services: <https://uss.ucsd.edu/>

Triton Concern Line: (858) 246-1111

<http://blink.ucsd.edu/go/students-of-concern>

Report students of concern

Student Accommodations

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) which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to Faculty (please make arrangements to contact me privately) and to the OSD Liaison in the department in advance so that accommodations may be arranged.

Office for Students with Disabilities (OSD)

<https://disabilities.ucsd.edu/> | osd@ucsd.edu | (858)534-4382

UC San Diego Principles of Community

The University of California, San Diego is dedicated to learning, teaching, and serving society through education, research, and public service. Our international reputation for excellence is due in large part to the cooperative and entrepreneurial nature of the UC San Diego community. UC San Diego faculty, staff, and students are encouraged to be creative and are rewarded for individual as well as collaborative achievements.

To foster the best possible working and learning environment, UC San Diego strives to maintain a climate of fairness, cooperation, and professionalism. These principles of community are vital to the success of the University and the well being of its constituents. UC San Diego faculty, staff, and students are expected to practice these basic principles as individuals and in groups. <https://ucsd.edu/about/principles.html>

Equity, Diversity and Inclusion

UC San Diego (as an institution) and I (as a human being and instructor of this course) are committed to full inclusion in education for all persons. Services and reasonable accommodations are available to students with temporary and permanent disabilities, to students with DACA or undocumented status, to students with health or other personal concerns, and to students with other kinds of support needs. Please feel free to let me know if there are circumstances affecting your ability to participate in class. Some resources that might be of use include:

Office of Equity, Diversity, and Inclusion

<https://diversity.ucsd.edu/> | diversity@ucsd.edu | (858) 822-3542

Equity and Inclusion During COVID-19:

<https://diversity.ucsd.edu/centers-resources/equity-and-inclusion-during-covid-19.html>

Student Life: Diversity

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

UC San Diego Policies

Academic Integrity

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. So, think carefully before you act by asking yourself:

a) is what I'm about to do or submit for credit an honest, fair, respectful, responsible & trustworthy representation of my knowledge and abilities at this time and,

b) would my instructor approve of my action?

You are ultimately the only person responsible for your behavior. So, if you are unsure, don't ask a friend—ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at <http://academicintegrity.ucsd.edu>

(Source: Academic Integrity Office, 2018)

UCSD Student Conduct Code

https://students.ucsd.edu/files/student-conduct/ucsandiego-student-conduct-code_interim-revisions1-16-18.pdf

University of California Diversity Statement

<https://regents.universityofcalifornia.edu/governance/policies/4400.html>

Religious Accommodation

[EPC Policies on Religious Accommodation, Final Exams, Midterm Exams](#)