IMMUNOLOGY BICD140
SPRING 2024

Course Organizer, Professor Li-Fan Lu

Natural Science Building 5314 lifanlu@ucsd.edu

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COURSE WEBSITE:

https://canvas.ucsd.edu/courses/54662

LECTURES: Tuesdays and Thursdays 5:00p-6:20p @ MOS 0114. Lectures will provide much information not contained in the reading, please come to the lecture!

OFFICE HOURS WITH DR LU: Tuesday from 3:45-4:45pm @ Tata 3103. Moreover, no office hours for the first week of class and when there has been an exam that week (instead there will be a Q&A section). I would be happy to talk with you about the class, Immunology in general, science and your studies. I am a wasted resource if you do not take advantage of my office hours!

Q&A SECTION:

	Day & Time	Location
Midterm1	Mon, 4/22 (11a-12p)	BH 2130
Midterm2	Wed, 5/15 (11a-12p)	TBD
Final	Fri, 6/7 (11a-12p)	Muir 1138

TEXT BOOK: The Immune System, Garland publishing, Third or newer Edition by Parham. The textbook is NOT mandatory; there will be reading in it associated with every lecture. The lectures will make extensive use of the figures in the text, as well as other material.

PREREQUISITES: BICD100 (Genetics) and BIMM100 (Molecular Biology), and their prerequisites. If a prerequisite has been waived to allow you to take this class, it is your personal responsibility to make up any deficiencies that you may have.

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INSTRUCTIONAL ASSISTANTS:

Blair Chang yac046@ucsd.edu

Arturo Agramont aagramon@ucsd.edu

Duncan Hong dshong@ucsd.edu

OFFICE HOURS:

	Time	Location
Blair	Mondays 3:30-4:30 pm	Tata Hall 3102
Arturo	Tuesdays 2-3 pm	Town Square
Duncan	Fridays 9-10 am	Art of Espresso

DISCUSSION SECTIONS: (SPECIFIC IAS WILL BE ANNOUNCED IN WEBSITE AND FIRST WEEK OF LECTURE)

SECTION	DAY & TIME		LINK	IA
A01	M	9:00-9:50 am	Zoom Link	Blair

Discussion sections are a valuable part of this course, and although discussion sections are not mandatory, I highly recommend that you take part in them. These sections serve to clarify, emphasize and expand points that have been introduced in lecture. The answers to problem sets will be available during discussion, **but will not be posted**, so attendance will be highly valuable in preparation for exams. The section leaders craft each meeting to include opportunities for problem-solving, discussion, and expansion on particularly timely topics.

There are three discussion sections touching Special Topics, which are scheduled as follows:

April 10th -April 14th: Flow Cytometry

May 1st -May 5th: Transgenic mice

May 29th -June 2nd: Antibodies: measurement, characterization and applications.

PDF files for the aforementioned discussion sections are in the website under "Downloads"

There will be no sections or office hours the first week of class. Sections will begin the second week of class.

PROBLEM SETS: Three Problem Sets will be assigned through the website. Problem sets will not be graded, but the material covered will be central to the exams and a very valuable study guide. Written answers will be provided in the discussion sections.

REVIEW SESSIONS:

The IA will hold 2 hour review sessions before each midterm and the final on the Sundays before the Exams. Final times to be announced in class and on the website.

	Day/Time	Location	IAs
Mid 1	4/21 Sun 10-12a	Zoom	Blair and Arturo
Mid 2	5/12 Sun 10-12a	Zoom	Blair and Duncan
Final	6/9 Sun 5-7p	Zoom	All IAs

*The review will usually be held for two hours, with the extra time in case the review runs longer.

GRADING: Your performance in the course will be evaluated by assignments, 2 midterm exams and the final exam.

Assignments: All students will need to submit one to two thoughtful questions to the IA after each lecture. Question must be in multiple choice format (see example questions on the class website) and is due by 11:59 PM the same day of the lecture. (2 points x 6 = 12% of grade for each exam). IA will pick the 25 questions from each lecture to form the question bank (total 25 x 6 = 150 questions) that will be made available on the class website before each exam.

EXAMS: In the remaining 88% of grade for each exam, 28% comes from the exam questions chosen from the aforementioned question bank. Therefore, if you turn

in all your assignments in time and practice the provided question bank, in theory, you should be able to easily get 40% of grade for each exam already.

There are no scheduled make-up exams. Extraordinary circumstances preventing you from taking an exam must be discussed in advance with the Student Affairs Office and Dr. Lu. If exceptions are made for these special circumstances, the make-up will be an ORAL exam given by Dr. Lu. Exams will consist of fill in the blank (with the answer bank) and multiple choice questions. An ID card (student ID or driver's license) will be required at every exam.

Midterms (25% for each midterm of grade; will be conducted remotely via Zoom): Exam 1, covering all material covered and reading material assigned for lectures 1-6. Exam 2, covering all material covered and reading material assigned for lectures 8-13.

Final (50% of grade): Covering all lecture and reading material assigned the entire class with emphasis on material and reading assigned for lectures 15-20.

Bonus points: To encourage students to come up with thoughtful questions, students get will 2 more points in the exam for each question that has been selected by the IA into the corresponding question bank.

LETTER GRADE: The grading is normalized to the higher score (top 5%). 60-70% of that score will be a D, 70-80% will be a C, 80-90% will be a B, and 90-100% of that will be an A. If everyone did well, then it would be possible for the entire class to receive A's or at least a high B; however, given the challenging nature of Immunology, this is unlikely. You are not competing with your fellow students. There is no shortage of high grades for those who do well. It is my hope that everyone will study hard enough to demonstrate sufficient knowledge of Immunology to earn an A or B. However, do not rely on your peers doing poorly...it is you against the material. If you have a concern about your grade or your performance on an exam, you must address this with me within one week of the exam, no exceptions. Do work that you can be proud of and stand by your performance.

REGRADE POLICY:

1. Send an email specifying which specific problem should be looked at and fully describe why you think the problem was wrongly graded.

2. Include BICD140 regrade request in your email subject.

3. The regrade request must be emailed within 1 week after the exams are graded.

EMAIL COMMUNICATION (TO DR. LU AND IAS): Please remember to include your first and last name in the body of the email and WRITE BICD140 IN E-MAIL SUBJECT (your e-mail will not be read if you do not write that). I will not respond to any questions regarding the content of the exams by email or answer lengthy questions on course material or anything else that can be done in person before/after class or during office hours. I will address questions about the course material during office hours. Please come talk to me in person.

LECTURE NOTES: The lecture slides will be posted on the website the day before the lecture. It is your responsibility to keep track of last minutes changes in the slides. Students are required to have access to the internet in order to obtain class information (syllabus, IA sections) and materials (problem sets). Information available on the website will not be handed out in class.

GOALS OF THE COURSE:

Immunology is the study of the physiological mechanisms that organisms use to defend their bodies from invasion by other organisms. The origins of the subject lie in the practice of medicine and in historical observations that people who survived the ravages of epidemic disease were untouched when faced with the same disease again—they had become immune to infection. Infectious diseases are caused by microorganisms, which have the advantage of reproducing and evolving much more rapidly than do their human hosts. During the course of an infection, the microorganism can pit enormous populations of its species against an individual. In response, the human body invests heavily in cells dedicated to defense, which collectively form the immune system. Parham 3rd Edition.

During this quarter, we will explore the complex biology of the many cell types that defend the human body from infectious agents with the final goal of understanding how the immune system unites molecular, cellular, evolutionary and genetic principles to fight the war against pathogens.

ACHIEVING THE COURSE GOALS:

Learning Immunology: Immunology is not a linear discipline. You have to bring together several concepts simultaneously in order to understand each aspect of immunity. As you read and review, you will find that you have to look up terms and definitions, and it is an interactive process. You learn subjects 1, 2, and 3, and then you can go back and understand subject 1 with more clarity. **You**

cannot learn immunology in one pass and <u>you cannot learn it quickly before the exam.</u> Start studying from the first week, and do not fall behind.

Lecture: Lectures are held twice a week and cover the major concepts indicated on the schedule. Please note that the indicated schedule and readings may be modified somewhat during the quarter, and any changes will be announced in lecture. While lecture slides will be posted on the class website before the class, these slides are **not** intended to replace lecture, and there will be material presented in class that does not appear in the lecture slides. <u>You will be responsible for information provided in lecture in addition to the material assigned in the text.</u>

Reading: Reading assignments are noted on the schedule. Any additional reading will be announced in lecture and on the web site. **You are strongly encouraged to read text material *before* lectures.**

Problem Solving: Three problem sets will be assigned. They will be posted on the website under "Files" and announced in class. You are encouraged to work these problems before section and to be prepared to discuss the answers during section. The answers will be provided and discussed during discussion sections.

The Learning Environment: Participation in class (e.g. questions or responses to questions by the instructor) is strongly encouraged and contributes to a rich, interactive learning environment. Please refrain from eating, reading newspapers, scanning the web, and engaging in conversations during lectures and sections. Cell phones and messaging devices should be turned off. If you must leave class early, please sit in the back in an aisle seat so that you do not disturb others. Following these guidelines will help you, your colleagues, and instructors to stay focused on the material.

POLICY FOR POTENTIAL REFERENCE LETTER REQUEST: Having a letter does not always help you. In fact having a lukewarm letter will hurt you more than you think. <u>A good letter needs real examples not just good words!</u>

1. You need to be top 10% in the class.

2. You need to catch my attention either during or outside the class and office hours.

3. You need to catch IA's attention during the discussion sections or review sessions.

Academic integrity: Work on exams must be solely your own. Cheating will not be tolerated and will result in an F in the course, as well as any additional disciplinary actions as indicated by the policy to maintain academic honesty. Please note, letting someone cheat off of your exam is cheating!!

Please review UCSD's Policy on Academic Integrity:

http://www-senate.ucsd.edu/manual/appendices/app2.htm#AP14

On each of your midterms I will ask you to sign an honor code stating:

I pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

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SCHEDULE FOR LECTURES & EXAMS AND READING MATERIAL

Lecture 1: April 2. Overview of the Immune System. Adaptive vs. Innate Immunity. Read Chapter 1, 3rd Edition.

Lecture 2: April 4. Innate Immunity. Read Chapter 2, 3rd Edition.

Lecture 3. April 9. Innate Immunity cont. Read Chapter 2, 3rd Edition.

Lecture 4: April 11. Adaptive Immunity. Read Chapter 3, 3rd Edition.

Lecture 5: April 16. Antibodies: What are they, what do they do and how do they come to be? Read Chapter 4, 3rd Edition.

Lecture 6: April 18. B cell development and rearrangement of antibody genes. Read chapter 6, 3rd Edition.

Lecture 7: April 23. EXAM# 1, including all material covered and reading material assigned for lectures 1-6.

Lecture 8: April 25. T cell recognition of antigen. Read chapter 5, 3rd Edition.

Lecture 9: April 30. T cell recognition of antigen cont. Read chapter 5 & 15 (15-1~15-10), 3rd Edition.

Lecture 10: May 2. T cell development. Read Chapter 7, 3rd Edition.

Lecture 11: May 7. T cell development cont. Read Chapter 7, 3rd Edition.

Lecture 12: May 9. T cell activation. Read Chapter 8, 3rd Edition.

Lecture 13: May 14. T cell activation cont. Read Chapter 8, 3rd Edition.

Lecture 14: May 16. EXAM #2, including all material covered and reading material assigned for lectures 8-13.

Lecture 15: May 21. B and T cell collaboration. Read Chapter 8 & 9, 3rd Edition.

Lecture 16: May 23. B cell activation and antibody mediated immunity. Read Chapter 9, 3rd Edition.

Lecture 17: May 28. Hypersensitivity. Read Chapter 12, 3rd Edition.

Lecture 18: May 30. Autoimmunity. Read Chapter 13, 3rd Edition. This lecture will be taught by Dr. Ye Zheng.

Lecture 19: June 4. Vaccines and infectious disease. Read Chapter 11&14, 3rd Edition.

Lecture 20: June 6. Tumor immunity. Review Chapter 16, 3rd Edition.

FINAL EXAM: June 13th. 7:00p - 10:00p including all lecture and reading material assigned for the entire course with emphasis on material and reading assigned for lectures 15-20.