IMMUNOLOGY BICD140
SPRING 2013

Course Organizer, Professor Li-Fan Lu

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COURSE WEBSITE:

http://classes.biology.ucsd.edu/bicd140.SP13

Username: bicd140sp13

Password: immunity

OFFICE HOURS WITH DR LU: Tuesday from 2-3pm in 5314 on the 5th floor of Natural Science Building, except 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	Monday, 4/22 (11a-12p)	Pacific Hall 3500
Midterm2	Tuesday, 5/14 (2-3p)	Pacific Hall 3500
Final	Thursday, 6/6 (11a-12p)	Pacific Hall 3500

TEXT BOOK: The Immune System, Garland publishing, Third Edition by Parham. The textbook is 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. There are a limited number of texts on reserve at the Biomedical Library along with a somewhat more detailed book, Immunobiology -- by Charles Janeway, Jr. and Paul Travers. Immunobiology is available online (http://www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.View..ShowTOC&rid=imm.TOC&depth=2) and the link is also on the class website.

LECTURES: Tuesdays and Thursdays 8-9:20 LEDDN AUD. Lectures will provide much information not contained in the reading, please come to lecture!

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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TEACHING ASSISTANTS:

Fares-Frederickson, Nancy	nfares@ucsd.edu
Bruckman, Rachel	rbruckma@ucsd.edu
Yeung, Andrew A.	aayeung@ucsd.edu
Lund, Sean	slund@ucsd.edu

OFFICE HOURS:

	Time	Location
Nancy	Wednesday 4-5p	Bonner Hall 3146
Rachel	Thursday 9-10a	Student Center B
Andrew	Monday 5-6p	Treehouse Lounge (Student Center)
Sean	Friday 9:30-10:30a	Café Roma (Price Center)

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

SECTION	DAY & TIME		LOCATION		TA
A01	Tu	5:00p - 5:50p	CENTR	220	Nancy
A02	Tu	6:00p - 6:50p	CENTR	220	Nancy
A03	W	8:00a - 8:50a	CENTR	220	Rachel
A04	W	7:00p - 7:50p	CENTR	220	Sean
A05	F	8:00a - 8:50a	CENTR	220	Rachel
A06	F	3:00p - 3:50p	CENTR	220	Andrew

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:

Week April 8th -April 12th : Flow Cytometry

Week April 29th –May 3rd : Transgenic mice

Week May 20th -May 24th : 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, you may chose to attend any section you like.

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 NOT be provided but will be addressed in the discussion sections.

REVIEW SESSIONS:

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

	Day/Time	Location	TAs
Midterm 1	Friday, 4/19 (5-8p)*	CSB 002	Rachel and Sean
Midterm 2	Monday, 5/13 (4-6:50p)*	Solis 104	Nancy and Andrew
Final	Friday, 6/7 (4-6:50p)*	Center 212	All TAs

*The times reflect the time the room is reserved. Most likely, the review will actually be held for the first two hours of the reservation, with the extra time in case the review runs longer.

EXAMS: Your performance in the course will be evaluated by 2 midterm exams (25% each) and the final exam (50%). The midterms are optional (see below for details). There will be only one final given as it is impossible to accommodate those with multiple finals on the same day. There are no scheduled make-up

exams. Failure to take the final exam will result in a zero. Extraordinary circumstances preventing you from taking an exam must be discussed in advance with the Student Affairs Office (1128 Pacific Hall) 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. A #2 pencil and an ID card (student ID or driver's license) will be required at every exam.

Midterms: 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. You have the option to drop one or both midterms after taking it. However, if you chose to do so, you must notify me by email using your UCSD email account **by 11:59pm in the same day after taking the exam**. Your final grade will be determined by your performance on the final exam and the number of the midterms you have taken (ex. dropping one midterm results in 37.5% on the remaining one and 62.5% on the final; dropping both results in 100% on the final).

Final: Covering all lecture and reading material assigned the entire class with emphasis on material and reading assigned for lectures 15-20.

Extra credit: To enrich your learning experience, I would like to encourage you to attend a research seminar on am important topic in Immunology (see below). You can earn up to 5% extra-credit to your final grade if you attend the following lectures (1% for attending one lecture, 2% for two lectures and 5% for attending at least three lectures). See class website for directions. There will be a designated TA at each of the seminars, to receive credit, **please sign in with the TA at the end…credit will not be assigned after the fact…you must sign in with the TA.**

SEMINAR LIST:

DAVID ARTIS TA: Andrew
"Immune regulation at barrier surfaces"
Wednesday 04/03/13 : 12:00 PM
La Jolla Institute for Allergy and Immunology
(http://www.liai.org/pages/directions)

PAUL ALLEN TA: Nancy
"Signaling and specificity of positive selection of CD4+ T cells"
Thursday 04/04/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

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KEN MURPHY TA: Andrew
"TBA" Likely transcriptional regulation in DC and T cell development
Wednesday 04/17/13 : 12:00 PM
La Jolla Institute for Allergy and Immunology
(http://www.liai.org/pages/directions)

ERIC PAMER TA: Sean
"Microbiota-mediated defense against intestinal infection"
Thursday 04/18/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

MARK ANSEL TA: Rachel
"TBA" Likely miRNA in T cell immunity
Wednesday 04/24/13 : 12:00 PM
La Jolla Institute for Allergy and Immunology
(http://www.liai.org/pages/directions)

FREDERICK ALT TA: Sean
"Antigen Receptor Locus Diversification, Genome Stability and Cancer in the Immune System"
Thursday 04/25/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

DAVID SCHATZ TA: Sean
"TBA" Likely V(D)J recombination
Thursday 05/02/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

MICHAEL DUSTIN TA: Rachel
"TBA" Likely lymphocyte migration
Wednesday 05/15/13 : 12:00 PM
La Jolla Institute for Allergy and Immunology
(http://www.liai.org/pages/directions)

AVERIL MA TA: Nancy
"TBA" Likely innate immune signaling
Thursday 05/16/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

RANJAN SEN TA: Andrew
"TBA" Likely V(D)J recombination
Monday 05/20/13 : 10:00 AM
Natural Science 1205 at UCSD

GARY KORETZKY TA: Rachel
"TBA" Likely lymphocyte signaling
Wednesday 06/05/13 : 12:00 PM
La Jolla Institute for Allergy and Immunology
(http://www.liai.org/pages/directions)

DARIO VIGNALI TA: Nancy
"TBA" Likely T cell signaling and type I diabetes
Thursday 06/06/13 : 12:00 PM
Committee Lecture Hall Molecular Biology Building at Scripps Research
(http://www.scripps.edu/research/ims_affinity/directions.html)

GRADING: 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.

We count the number of exams handed out, the number of exams turned in…and the number we hand back…and copy the exams.

REGRADE POLICY:

1. Write a cover letter specifying which specific problem should be looked at and fully describe why you think the problem was wrongly graded.

2. Include your email address in your cover letter so that I can contact you regarding the decision on the regrade.

3. Attach the cover letter to the exam and deliver to Dr. Lu. The regrade request must be delivered within 1 week after the graded exams are returned.

4. Please be advised that a random sampling of exams will be photocopied. If exams submitted for regrade are found to be altered, this will be considered a breach in academic honesty and will result in failure of the course.

EMAIL COMMUNICATION (TO DR. LU AND TAS): 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 schedule a meeting with you 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, TA 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 you cannot learn it quickly before the exam.** 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 notes are **not** intended to replace lecture, and there will be material presented in class that does not appear in the lecture slides. You will be responsible for information provided in lecture in addition to the material assigned in the text.

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.** You will note that at the end of each chapter, problems and lists of key concepts are given. You are encouraged to try solving these problems and make use of supplementary material before lecture.

Problem Solving: In addition to problems given at the end of the chapter, three problem sets will be assigned. They will be posted on the website under "downloads" 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 **not** be posted, but they will be 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.

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.

There will be NO written material allowed for reference during any of the exams.

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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 (PDF on website).

Lecture 2: April 4. Innate Immunity. Read Chapter 2, 3rd Edition (PDF on website).

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. This lecture will be taught by Dr. Ananda Goldrath.

Lecture 11: May 7. T cell development cont. Read Chapter 7, 3rd Edition. This lecture will be taught by Dr. Ananda Goldrath.

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 11th. 8:00a - 11:00a including all lecture and reading material assigned for the entire course with emphasis on material and reading assigned for lectures 15-20.