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# IMMUNOLOGY BICD140

FALL 2023

## 1) PROFESSOR AND INSTRUCTIONAL ASSISTANTS:

**PROFESSOR: DR. ELINA ZUNIGA** <http://biology.ucsd.edu/research/faculty/eizuniga>

E-mail address: eizuniga@ucsd.edu

## **INSTRUCTIONAL ASSISTANTS:**

NAME	POSITION	E-MAIL
Shannon D'Ambrosio	Graduate Instructional Apprentice	sdambros@ucsd.edu

**EMAIL COMMUNICATION (TO DR. ZUNIGA AND IAS):** Please remember to include your first and last name in the body of the email and WRITE BICD140 IN E-MAIL SUBJECT (we may miss your email if you do not write BICD140 in the subject). We 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 lectures, discussion sections or during office hours. We will address questions about the course material during office hours. Please talk to us during this time.

## 2) COURSE WEBSITE:

<https://canvas.ucsd.edu>

## 3) 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 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 3<sup>rd</sup> 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.

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**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.

## **4) 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.

## **5) TEXT BOOK:**

**The Immune System**, Garland publishing, Fourth or Fifth Edition by Parham. The textbook is optional but highly recommended, 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>).

## **6) LECTURES:**

**Note that we will use different formats for the different the lectures (i.e. Zoom, recorded, in person regular lecture and in person flipped classroom) as indicated for each lecture in the schedule below. In person lectures and flipped classrooms will be at:**

**Tuesdays and Thursdays 3:30p-4:50p (US Pacific Time)**

**LOCATION: YORK 2622.**

Lectures will provide much information not contained in the reading and cover the major concepts indicated on the schedule. Please note that the schedule and readings indicated below 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 lectures, 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. It is your responsibility to keep track of last minutes changes in the slides. Information available on the website will not be handed out in class.

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**Reading:** Reading assignments are noted on the schedule below. Any additional reading will be announced in lecture and on the web site. **You are strongly encouraged to read text material *before* lectures and/or use the reading to clarify and deepen concepts that were covered in lectures.**

## SCHEDULE FOR LECTURES & EXAMS AND READING MATERIAL

### Thursday Sept 28<sup>th</sup>

**Lecture 1: Overview of the Immune System. Adaptive vs. Innate Immunity.** Read Chapter 1. This lecture will be via **Zoom ONLY** and a Zoom link will be available in the course website. There will NOT be an in-person lecture on this date.

### Tuesday Oct 3<sup>rd</sup> and Thursday Oct 5<sup>th</sup>

*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 2-4 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture to answer any question you may have on the material recorded in an optional office hour format.*

**Lecture 2: Innate Immunity.** Read Chapter 2&3. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 3: Innate Immunity cont.** Read Chapter 2&3. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 4. Adaptive Immunity.** Read Chapter 4. **Where is the immune system?** Read Chapter 1 (1-11 to 1-14). This lecture will be recorded ONLY and will be available in the course website.

### Tuesday Oct 10<sup>th</sup>

**Flipped classroom: Discussion & problem solving for lectures 1,2,3,4** Watch recording of lecture #1-4 **IN ADVANCE** and attend the lecture room in person.

### Thursday Oct 12<sup>th</sup>

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*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 5&6 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture to answer any question you may have on the material recorded in an optional office hour format.*

**Lecture 5: Antibodies: What are they, what do they do and how do they come to be?** Read Chapter 4. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 6: B cell development and rearrangement of antibody genes.** Read Chapter 6. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 7: B cell development and rearrangement of antibody genes cont.** Read Chapter 6. This lecture will be recorded ONLY and will be available in the course website.

**Tuesday Oct 17<sup>th</sup>**

**Flipped classroom: Discussion & problem solving for lectures 5&6&7** Watch recording of lecture #5,6&7 IN ADVANCE and attend the lecture room in person.

**Thursday Oct 19<sup>th</sup>**

**Lecture 8: Introduction to Flow cytometry and Q&A.** This lecture will be a regular in-person only lecture.

**Tuesday Oct 24<sup>th</sup>**

**EXAM# 1, including all material covered and reading material assigned for lectures 1-7. In-person only. Location: same room where lectures are delivered**

**Thursday Oct 26<sup>th</sup>**

*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 9&10 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture*

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*to answer any question you may have on the material recorded in an optional office hour format.*

**Lecture 9: T cell recognition of antigen.** Read Chapter 5. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 10: T cell recognition of antigen cont.** Read Chapter 5. This lecture will be recorded ONLY and will be available in the course website.

## Tuesday Oct 31<sup>st</sup>

**Flipped classroom: Discussion & problem solving for lectures 9&10. Introduction to transgenic and KO mice.** Watch recording of lecture #9&10 IN ADVANCE and attend the lecture room in person.

## Thursday Nov 2nd

*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 11&12 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture to answer any question you may have on the material recorded in an optional office hour format.*

**Lecture 11: T cell development.** Read Chapter 7. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 12: T cell development cont.** Read Chapter 7. This lecture will be recorded ONLY and will be available in the course website.

## Tuesday Nov 7<sup>th</sup>

**Flipped classroom: Discussion & problem solving for lectures 11&12** Watch recording of lecture #11&12 IN ADVANCE and attend the lecture room in person.

## Thursday Nov 9th

*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 13&14 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture to answer any question you may have on the material recorded in an optional office hour format.*

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**Lecture 13: T cell activation.** Read Chapter 8. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 14: T cell activation cont.** Read Chapter 8. This lecture will be recorded ONLY and will be available in the course website.

**Tuesday Nov 14<sup>th</sup>**

**Flipped classroom: Discussion & problem solving for lectures 13&14.** Watch recording of lecture #13&14 IN ADVANCE and attend the lecture room in person.

**Thursday Nov 16th**

*EXAM #2, including all material covered and reading material assigned for lectures 9-14. In-person only. Location: same room where lectures are delivered*

**Tuesday Nov 21st**

*There will not be an in person or zoom lectures on this week. It is left free for you to watch Lectures 15&16 which will be recorded and available at course website. One of us will be available at the time and location corresponding to the lecture to answer any question you may have on the material recorded in an optional office hour format.*

**Lecture 15: B and T cell collaboration.** Read Chapter 9. This lecture will be recorded ONLY and will be available in the course website.

**Lecture 16: B cell activation and antibody mediated immunity.** Read Chapter 9. This lecture will be recorded ONLY and will be available in the course website.

**Thursday 23<sup>rd</sup>: Thanksgiving no lecture**

**Tuesday Nov 28<sup>th</sup>**

**Flipped classroom: Discussion & problem solving for lectures 15&16. Introduction to monoclonal antibodies.** Watch recording of lecture #15&16 IN ADVANCE and attend the lecture room in person.

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## Thursday Nov 30th

**Lecture 18: Vaccines (by Dr. Susan Kaeck).** Read Chapter 11&13. *The format of this lecture (in-person, Zoom or recorded) will be defined closer to the date based on Dr. Kaeck's availability.*

<https://www.salk.edu/scientist/susan-kaech/>

## Tuesday Dec 5th

**Lecture 19: Autoimmunity (by Dr. Ye Zheng).** Read Chapter 14&16. *The format of this lecture (in-person, Zoom or recorded) will be defined closer to the date based on Dr. Zheng's availability.*

<https://www.salk.edu/scientist/ye-zheng/>

## Thursday Dec 7th

**Lecture 19: 11/29. Hypersensitivity.** Read Chapter 14. *This lecture will be a regular in-person only lecture.*

***FINAL EXAM: Monday 12/11/2023 3-6 PM including all lecture and reading material assigned for the entire course with emphasis on material and reading assigned for lectures 16-20. In-person only. Location: TBA***

## 7) I-CLICKER:

To enrich your learning experience through class participation I will use i-clicker in all the *in person* lectures and flipped classroom sessions. I>clicker is a response system that allows you to respond to questions I pose during class. You are required to purchase an i>clicker remote (available in bookstore) and register it online for in-class participation. We will start using clicker and counting points on the third week of instruction and thereafter. PLEASE REGISTER YOUR I-CLICKER **BEFORE** THE THIRD WEEK OF INSTRUCTION.

**How I-clicker answers will be graded?** You will be graded on participation. You will earn one point per lecture (beginning on the third week of instruction) only if you respond to ALL BUT ONE QUESTION, regardless of the answer (correct and incorrect answers will count the same). THE POINT IS EARNED FOR THE OVERALL LECTURE NOT INDIVIDUAL QUESTIONS. You will get NO point if you miss more than one question during the lecture (bring extra batteries). The i-



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clicker points earned during the whole course will count for up to 5% of extra-credit (more explanation about extra-credit grading below).

**How do I register my i-clicker?** Each clicker has a unique serial number on the back of the remote. Write down the number and place a piece of scotch tape over that bar code and ID to preserve it. In order to receive credit for your votes, YOU WILL NEED TO REGISTER YOUR I>CLICKER REMOTE ONLINE. For this, please go to our course website, look for “I-clicker registration” on the left menu and follow the instructions to register you i-clicker.

**8) OFFICE HOURS:** Office hours will be held every week, beginning the second week of instruction.

**OFFICE HOURS WITH DR ZUNIGA:** Office hours with Dr. Zuniga will be held every Friday from 3:00 PM to 4:00 PM at Tata Hall, Room 3102 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!

## OFFICE HOURS WITH IA:

IA	Day/Time	Location:
Shannon D'Ambrosio	Thursday 10:30 AM to 11:30 AM	Tables outside MOM's Café (aka Muir Woods Coffee House)

## 9) DISCUSSION SECTIONS:

There will be no discussion sections in this course

## 10) OPTIONAL SEMINARS:

Information about advanced seminars by renowned immunologists is available at:

[www.globalimmunotalks.org](http://www.globalimmunotalks.org)

Attendance to these seminars is optional. However, it can help you to expand your knowledge in immunology and learn about the cutting-edge research in the field. Seminars are live on Wednesdays 9 AM PST and also recorded since April 22<sup>nd</sup> 2020. Therefore, you have recordings available in YouTube channel named “Global Immunotalks” for a great variety of seminars to expand the concepts learned as much as you wish.

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## **11) EXAMS:**

Your performance in the course will be evaluated by i-clicker (5%), 2 midterm exams (25% each) and the final exam (45%). There are no scheduled make-up exams.

I estimate that we will use I-clicker in *approximately* 8 lectures. Thus, I-clicker participation per each lecture will be worth approximately 0.63 % of your grade (5% maximum divided 8 lectures=0.63%).

Exams will consist of short answers, fill in the blank and multiple choice questions. An ID card (student ID or driver's license) will be required at every exam. Failure to take the 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. Zuniga. If exceptions are made for these special circumstances, the make-up will be an ORAL exam given by Dr. Zuniga.

**Midterms:** Exam 1, covering all material covered and reading material assigned for **lectures 1-7**. Exam 2, covering all material covered and reading material assigned for **lectures 9-14**.

**Final:** Covering all lecture and reading material assigned the ENTIRE class with emphasis on material and reading assigned for **lectures 16-20**.

## **12) GRADING:**

The grading is normalized to the higher scores (average of top 5 scores). After score normalization, 60-70% will be a D, 70-80% will be a C (>76% C+), 80-90% will be a B (>86% B+), and 90-100% of that will be an A (>96% A+). 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 following the re-grade policy below, no exceptions.

### **REGRADE POLICY:**

1. Give Professor Zuniga a written letter (after lecture) specifying which specific problem should be looked at and fully describe why you think the problem was wrongly graded.
2. The re-grade request must be handed to Prof Zuniga in person after lecture within 1 week after the exams are graded.

**13) 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.

**14) 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://senate.ucsd.edu/Operating-Procedures/Senate-Manual/appendices/2>

On each of your exams 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.