

Course Syllabus

BILD 28 Immunity, Vaccination and Immunotherapy

Immunity is generally thought of as the mechanisms that organisms use to defend their bodies from invasion by other organisms. However, the immune system is also a central player in many diseases that do not involve infection including: autoimmunity, allergy, and cancers. Furthermore, inflammation contributes to the development of cardiovascular and metabolic diseases. In this course we will learn about strategies to influence the immune system in a variety of human diseases to improve health outcome—collectively termed immunotherapy. Vaccination, the original immunotherapy, being the most prominent and powerful medical intervention. Immunotherapy can be designed to induce, enhance, or suppress an immune response. Knowing the key players in how the human body fights disease is often the first step in designing novel therapeutic interventions. Many novel “drugs” are modifications of our immune system’s molecules and cells. We will use the appreciation of each example of immunotherapy to understand the underlying biological mechanisms of the immune system.

My office hours will be weekly on Tuesdays after class outside of Tata Hall 3:20-4:15 unless otherwise noted.

Tuesday April 4th Introduction to the immune system and disease

Thursday April 6th The players: pathogens and immune cells

Tuesday April 11th Overview of the challenges of the immune system.

Thursday April 13th Evolution of the immune system. Guest Prof. Hedrick

Tuesday April 18th Co Evolution of the Immune System and Pathogens. Guest Prof. Daugherty

Thursday April 20th. Antibodies and B cells and antibody functions. Guest Prof. Mikael Sigvardsson

Tuesday April 25th Secondary responses, booster vaccines and germinal centers.

Thursday April 27st. History of vaccination, the original immunotherapy. Different strategies to replace disease with a controlled pathogen exposure/vaccine.

Tuesday May 2nd Development of SARS-CoV-2 vaccines.

Thursday May 4th Vaccines continued

Tuesday May 9th Midterm

Thursday May 11th Living with infection: what happens when we can't eliminate a pathogen?

Tuesday May 16th Immunotherapies for cancer: Check point blockade. Guest Dr. Nicole Scharping

Thursday May 18th Immunotherapies for cancer: Adoptive cell therapies. Guest Dr. Miguel Reina-Campos

Tuesday May 23rd Immunotherapies for immunodeficiencies and blood cancers. Guest Dr. Max Heeg

Thursday May 25th Malignancies in the immune system. Guest Prof. Mikael Sigvardsson

Tuesday May 30th Unwanted immune responses-allergy and autoimmunity.

Thursday June 1st The Hygiene Hypothesis

Tuesday June 6th Immunotherapies for autoimmunity.

Thursday June 8th Additional Considerations.

Final: 06/13/2023 @ 3pm

You have registered for a weekly session, please plan on attending, as discussion sessions will support the topics covered in class.

BILD28 Immunology/Vaccines A00 Goldrath, Ananda T/Th 2:00PM-3:20 PM
TATA3201

A01	M	2:00 PM	2:50 PM	HSS 2150 Ya-Yuan
A02	W	3:00 PM	3:50 PM	HSS 2150 Gabriel
A03	F	11:00 PM	11:50 PM	HSS 2150 Gabriel
A04	F	12:00 PM	12:50 PM	HSS 2150 Michelle

Final 06/13/2023 @ 3pm

Your fabulous IA's this quarter are:

Gabriel Ascui: gascui@health.ucsd.edu

Ya-Yuan Chan: yachan@ucsd.edu

Michelle Chiew: mhchiew@ucsd.edu (<mailto:mhchiew@ucsd.edu>)

TA office Hours:

Ya-Yuan: Thursday HSS 1145L 12:30-1:30pm or by appointment.

Michelle: Monday APM Language Lab 3-4 PM or by appointment

Exams: Your performance in the course will be evaluated by weekly quizzes on Canvas, 4 small assignments, 1 midterm exam and the final exam. Exam and grading policies are as follows: The Midterm will consist of fill in the blank, short answer, multiple choice, and short essay questions. Pens, a #2 pencil and an ID card (student ID or driver's license) will be required at every exam. There are no scheduled make-up exams. 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 Professor Goldrath. IF exceptions are made for these special circumstances, the make-up will be an ORAL exam given by Professor Goldrath. There will be only one final given, I am sorry but it is impossible to accommodate those with multiple finals on the same day.

Quizzes: Worth 20% of your grade covering reading assigned and lectures. Will be posted on Thursdays and Due Sunday night. I will drop the lowest quiz grade.

Assignments: Worth 20% Short write ups requiring you to complete a reading or research a topic. A week will be given for each assignment.

Midterm: Worth 30% of your grade, covering all material covered and reading material assigned for lectures up to the exam on May 3rd.

Final: 30% of your grade. Covering all lecture and reading material assigned the entire class with emphasis on material and reading assigned for lectures 12-20.

Grading: The grading is normalized to the high score. 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 an A. If everyone did well, then it would possible for the whole 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. If you have concern about your grade or performance on an exam you must address this with me within one week of the exam, no exceptions. DO WORK THAT YOU WILL BE PROUD OF AND STAND BY YOUR PERFORMANCE.

email communication: is the appropriate email for all correspondence directly or through Canvas. Please put BILD28 in the subject and remember to include your first and last name in the body of the email. 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. Email communication that will receive a prompt answer from me will more along the lines of, "I am in the hospital and missed the exam..." Please come talk to me in person.

Academic integrity: 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 review UCSD's Policy on Academic Integrity: [http://www-senate.ucsd.edu](http://www-senate.ucsd.edu/manual/appendices/app2.htm#AP14) → [\(http://www-senate.ucsd.edu\)](http://www-senate.ucsd.edu/manual/appendices/app2.htm#AP14)

On your midterm 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.

Please note, letting someone cheat off of your exam is cheating!!

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

There will be no cheating tolerated in this class.

Resources:

Intro to the immune system:









<https://www.youtube.com/watch?v=k9QAYP3bYmc> → [\(https://www.youtube.com/watch?v=k9QAYP3bYmc\)](https://www.youtube.com/watch?v=k9QAYP3bYmc)



[\(https://www.youtube.com/watch?v=k9QAYP3bYmc\)](https://www.youtube.com/watch?v=k9QAYP3bYmc)

<https://www.nytimes.com/guides/smarterliving/improve-your-immune-system>

Course Summary:

Date	Details	Due
Mon Apr 10, 2023	 Program in Immunology Seminar https://canvas.ucsd.edu/calendar?event_id=893151&include_contexts=course_44959	9:30am to 10:30am
Tue Apr 25, 2023	 Quiz #1 https://canvas.ucsd.edu/courses/44959/assignments/641901	due by 2pm
Tue Apr 25, 2023	 Quiz #2 https://canvas.ucsd.edu/courses/44959/assignments/644546	due by 2pm
Tue May 2, 2023	 Quiz #3 https://canvas.ucsd.edu/courses/44959/assignments/646061	due by 2pm
Tue May 2, 2023	 Quiz #4 https://canvas.ucsd.edu/courses/44959/assignments/647513	due by 2pm
Mon May 8, 2023	 Second Assignment for credit--mRNA vaccine report https://canvas.ucsd.edu/courses/44959/assignments/646023	due by 11:59pm
Tue May 9, 2023	 First Assignment for possible credit--seminar w Dr. Lund April 10th. Write up. https://canvas.ucsd.edu/courses/44959/assignments/634340	due by 11:59pm
Fri Jun 2, 2023	 Assignment for credit--creative "illustration" of a key immunological idea that we have covered https://canvas.ucsd.edu/courses/44959/assignments/646497	due by 11:59pm