

Course Name. Advanced Immunology [BIO-3445/ BIO-4445/ BIO-6445]

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Overview. This course is for students who want to apply basic knowledge (from textbooks) towards understanding current research questions in immunology. Over the duration of the course, students will read, discuss and present talks on an instructor-determined set of 8-10 published or pre-print papers.

What are the expectations from students? It is important that students clarify doubts as we progress through the course. Students are expected to take active part in their learning experience and contribute to an environment conducive to learning by

- Staying current with any mandatory reading / videos / knowledge checks / quizzes / assignments etc.
- sharing thoughts, questions or doubts as we progress; actively participating in discussions. This can be done ideally in class but if not, then over google classroom or over email.
- being enthusiastic about learning the subject, being mentally and physically present in class.

Prerequisites. Students are required to have a fundamental knowledge of the immune system (students can do a self-assessment here <https://forms.gle/pfRKVditAp1BDBpr6> - if you can easily answer at least 8 out of 10 questions, then this course is for you). If you have learnt immunology through self-study or as a course taught in your previous degree, please do the quiz and talk to the instructor.

Learning Outcomes

1. Recall:

- a. Recall the fundamental principles and concepts of immunology.
- b. Identify key terms, processes, and pathways that we come across in our readings.

2. Understand:

- a. Explain some of the current research questions in immunology.
- b. Interpret and summarize information from published or pre-print papers.
- c. Demonstrate an understanding of the relationship between basic immunological concepts and published research.

3. Apply basic immunological knowledge to analyze and critique research methodologies used in selected papers.

Course Content. Please find the tentative weekly plan for course topics, the specific papers are from the Spring 2023 course (published no earlier than the year 2000). Selection of papers may change to reflect current research. While this serves as the foundational guide, I emphasize my commitment to responsive teaching: *The plan is*

subject to adjustments based on real-time class engagement and comprehension. If necessary, we may slow down for clarity or new content introduced to align with student interests or goals. The teaching plan is flexible to ensure the most effective and relevant learning experience, guided by student learning needs, assessments and participation.

Week	Broad topics to be covered	Details (subtopics)
Week 1	-Class expectations and logistics - Paper 1	- Preparation, pre- and post-work - Addressing specific learning needs, making a environment conducive to learning - Attendance and Presence - Timelines, assessments, office hours. - Paper 1 group exercise
Week 2	Paper 1	- Paper 1 Methods - Paper 1 Instructor presentation and class discussion
Week 3	Paper 2	- Group exercise - Methods
Week 4	Paper 2	- Instructor presentation and class discussion
Week 5	Paper 3	- Methods - Instructor led presentations and class discussion
Week 6	Paper 4	- Ungraded knowledge check quiz - Introduction
Week 7	Paper 4	- Student presentation on methods - Instructor led presentation and discussion
Week 8	Paper 5,6	- Instructor presentation - Interactive board exercise - class discussion
Week 9	Paper 5,6	- Group exercise and Methods - Instructor led presentation and class discussion
Week 10	Paper 7	- Introduction and methods - Preparation for debate

Week 11	Paper 7	- Paper 7 team-based debate.
Week 12	Class presentations	Students presented other papers they selected as part of the course assessment.

Requirements (Reading List and other materials)

6-10 main papers published in last 20 years or pre-prints (to be determined by the instructor). Textbooks for a refresher of fundamental concepts : Lauren Sompayrac’s How the immune system works and Kuby’s immunology. Lower on the list (only for specific topics) : Janeway’s Immunobiology.

List of full papers discussed in Spring 2023.

- 2004, Brinkmann et al (Neutrophil extracellular traps)
- 2015, Shi et al; 2016 Ding et al (Gasdermin, two papers one main)
- 2002, Martinon et al (Inflammasome)
- 2012, Odumade et al (Acute stage of EBV in humans)
- 2004, Pancer (Somatic diversification in Lampreys)
- 2009, Sun et al (Memory in NK cells)
- 2012, Stevens et al (Role of complement in CNS).

Attendance policy. As per OAA guidelines, students are allowed up to three absences with no questions asked and no documents required. This course allows for one more absence with no documentation but with prior information to the instructor. Further absences will need a valid reason and a timely doctor’s note or documentation as necessary. There is a 10 percent grade for attendance, absences beyond 6 classes will impact your final grade.

Assessment plan. Attendance - 10%; Paper presentation - 40% (20% for each of two talks, you can give up to four talks so the best two are counted); Evaluation of your talk by your classmates - 10% (5% for each of two talks)
 In class written assignments or low mark tests - 40%
 The final grade will be determined using relative grading.