



CELLULAR AND MOLECULAR BIOLOGY OF THE IMMUNE SYSTEM

BIOL 6351 SPRING 2026

TIME: MONDAY AND WEDNESDAY 10:00AM-11:15AM

LOCATION: CB1.206

INSTRUCTOR

Xintong Dong, Ph.D. (xintong.dong@utdallas.edu)

Office Hours: In person in BSB12.429 or via teams by appointment

COURSE DESCRIPTION

BIOL 6351 covers key topics in immunology including: innate immunity, complement system, V(D)J recombination, development and function of T and B lymphocytes and immunological memory. The last four weeks of the course will be dedicated to human diseases including allergy, autoimmune diseases, and cancer.

Students will read and discuss classical and contemporary papers weekly and complete weekly assignments.

COURSE LINKS AND MODALITY

This course will be taught in person.

We will be using eLearning. All materials can be found on the BIOL 6351 eLearning website.

STUDENT LEARNING OUTCOMES

Upon completion of this course, graduate students should be able to do the following:

1. Acquire systematic knowledge about the anatomy and physiology of the immune system.
2. Understand the development and function of key immune cell types, gene expression regulation, key ligand-receptor interactions for immune cell activation and suppression, and intracellular signaling pathways.
3. Understand the principles of key experimental techniques including flow cytometry, single cell RNA sequencing, cell activation assays and ELISA.
4. Read and critique research papers on topics such as immunology, infectious diseases and cancer.

TEXTBOOKS AND MATERIALS

1. Textbook: *Janeway's Immunobiology* by Murphy, Weaver and Berg
2. Web Browser

GRADING POLICY

- The final grade will be based on the following (see Course Policy for details):

Weekly journal clubs: 20%

Weekly assignments: 15%

Specific Aims page: 25%

Midterm exam: 20%

Final exam: 20%

- Final grade calculation:**

Item	Qty	Points	Total Points	% Final grade
Weekly journal clubs	10	20	200	20%
Weekly assignments	15	10	150	15%
Specific Aims topic pitch	1	50	50	5%
Specific Aims page	1	200	200	20%
Midterm exam	1	200	200	20%
Final exam	1	200	200	20%
TOTAL POINTS POSSIBLE	1000			

Your score percentage will be the total points earned divided by the “TOTAL POINTS POSSIBLE” amount shown above. This percentage will be rounded to the nearest integer, e.g., 89.5 = 90; 89.49 = 89.

- Grading scale:**

Grade	% cut off
A	90
A-	87
B+	84
B	80
B-	77
C+	74
C	70 and below

- Grades are determined based only on course performance. Grades are not based on need or effort. No points or fraction of a point will be awarded to increase to the next letter grade. **NO EXCEPTIONS.**
- In compliance with FERPA, grades and/or grade information will not be given to anyone other than the student and will not be discussed over the phone or emails.

COURSE POLICIES

LECTURES:

- Lectures will be on Mondays and Wednesdays in person.
- All lecture slides and reading materials will be provided in eLearning prior to each lecture.

WEEKLY JOURNAL CLUBS:

- There will be 10 journal club-style research paper discussions on Wednesdays (see course schedule). Each discussion is worth 20 points, adding up to 200 points total and will account for 20% of the final grade. Grading will be based on attendance, accurate explanation of experimental methods and data interpretation, and demonstration of critical thinking.
- The papers will be posted before the Monday lecture. All students are required to read the paper for the week before coming to class on Wednesday.
- Students will take turns explaining part of a data figure, the methods used to generate the data, what the results mean, and what's the conclusion. Students are also welcome to critique the authors' experimental design (choice of methods, proper controls, data interpretation).
- If a student must miss an in-person journal club discussion, a one-page summary of the paper shall be submitted as make-up to receive points. The summary page shall be emailed to the instructor by the end of the week (11:59pm on Sunday). Every student is allowed one make-up over the whole semester.

WEEKLY ASSIGNMENTS:

- There will be 15 weekly assignments on eLearning. Each assignment is worth 10 points. The total assignment points add up to 150 total points and will account for 15% of the final grade.
- Each assignment is due on eLearning on Sunday at 11:59pm. No extensions or make-ups will be allowed.
- You will have 1 hour to complete each assignment and 2 attempts. Once you start, do not stop, close the assignment, or log out.

SPECIFIC AIMS PAGE:

- Each student will be required to write a 1-page "Specific Aims" page for research proposal on a topic broadly related to immunology. Throughout the semester, we will slowly build up to it:
 - Week 7: Topic pitch. Each student should pick a specific topic for the proposal and email it to the instructor. The more specific the topic, the better (for example, "B cell development" would be too broad, but "the effect of molecule XXX on B cell development" will be much better). Everyone will make a topic pitch to the class on 3/4 and receive feedback. This assignment is worth 50 points.
 - Week 14: Specific aims page due. The specific aims page should include a brief introduction, statement of the main question and hypothesis, and experimental plans for 2-3 specific aims. The specific aims page will be due by email to the instructor on Sunday 5/3 at 11:59pm. The specific aims page is worth 200 points. Late submission will result in loss of points (5 points off every hour), submit on time!

EXAMS:

- There will be 1 Midterm and 1 Final Exam. Each is worth 200 points. Together, the 2 exams account for 40% of the final grade.
- The midterm exam will be held in class on 3/25 and will cover materials from the first 8 weeks (including all of T cell immunity but will not include B cell immunity).
- The final exam will be held in class on 5/6 and will cover materials from the whole semester.

Exam Format:

- Each exam will be 40 questions and worth 200 points.
- You will have 75 minutes to complete the exam. Average time to complete it should be 60 minutes.
- The structure of all exams will be mix of question styles divided as follows:
 - 80% multiple choice, true/false, matching questions
 - 20% fill-in the blank, short answer (1 paragraph maximum)
- Everything in the lectures is fair game for exams.
- Make-up lecture exams will be given only in extreme circumstances. Legitimate reasons to make-up missed exams are as follows: death of an immediate family member and bona fide medical emergencies. Any reason must be presented in writing prior to the exam start as is reasonably possible. A doctor's note is required for medical emergencies.

Exam Grading:

- I will try to have these scores posted within one week after the exam.
- Graded exams can be reviewed during the following week by appointment.
- All questions/issues regarding exam questions and grades must be resolved within the week after the exam is made available to review. After this week, the exam scores will be considered final. You may schedule an office hour time (see first page) to discuss any questions that you might have.

UT DALLAS SYLLABUS POLICIES AND PROCEDURES

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

THESE DESCRIPTIONS AND TIMELINES ARE SUBJECT TO CHANGE AT THE DISCRETION OF THE PROFESSORS.

TENTATIVE ACADEMIC CALENDAR

NOTE: The professor has the right to change the syllabus at any point during the semester.

Week	Assignment	Dates	Lecture	Journal club	Exam/SA page
1	1	1/21	Immune system overview		
2	2	1/26	Innate immunity		
		1/28		1	
3	3	2/2	Cytokines and chemokines		
		2/4		2	
4	4	2/9	Overview of adaptive immunity		
		2/11		3	
5	5	2/16	V(D)J recombination		
		2/18		4	
6	6	2/23	Antigen presentation and recognition		
		2/25		5	
7	7	3/2	T cell development		
		3/4			Research topic pitch
8	8	3/9	T cell mediated immunity		
		3/11		6	
Spring break					
9	9	3/23	B cell development		
		3/25			Midterm exam
10	10	3/30	Iggs and B cell diversity		
		4/1		7	
11	11	4/6	Antibody functions and complement		
		4/8		8	
12	12	4/13	Immune memory and vaccines		
		4/15		9	
13	13	4/20	Microbiome and mucosal immunity		
		4/22		10	
14	14	4/27	Allergy and hypersensitivity		Specific Aims page due 5/3 11:59pm
		4/29	Autoimmunity		
15	15	5/4	Cancer		
		5/6			Final exam