

COURSE OVERVIEW AND SYLLABUS

CAMB 510 – Immunology for CAMB

Spring 2025

Monday, Wednesday, and Friday - 10:15am-12noon
BRB 252

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GOALS: There are several goals for this course. One is to introduce students to basic fundamental principles and emerging therapeutics concepts in key areas of immunology. A second goal is to challenge students to think about how these principles and concepts were shaped through experiments, as well as their implications, limits and caveats. A third goal is to hone the ability of students to think clearly and critically about testing of specific hypotheses through experimental design and data interpretation. These goals will be achieved through lectures, discussions, assignments, and take-home exams. The course aims to provide students with foundations that will enable them to keep abreast of basic and translational immunology topics by appraisal of literature and seminars. The lectures are organized into three sections: innate immune mechanisms, adaptive immune mechanisms, and integrated immune responses.

CLASS FORMAT AND EXPECTATIONS: Each class will involve a 90-minute faculty lecture and a subsequent 30-minute faculty-led discussion and answering questions. Nearly each class will involve a different faculty who has volunteered to teach within their research area of expertise. As a result, class material will be presented and discussed in different styles, providing students the opportunity to develop the vital professional skill of extracting and integrating the most useful information from diverse scientists and topics, respectively. The TA and at least one faculty course director will be in attendance for each class.

READING: As some faculty will lecture assuming students have familiarity with the topic, it is recommended that, before each class, students read relevant chapters in the Janeway's Immunobiology text book (pdf available on Canvas) and review(s) recommended by the lecturer. Faculty also might recommend an experimental research paper. Reading materials will be posted on the course Canvas website as soon as provided by faculty, hopefully by one week before their lecture as requested.

CLASS PARTICIPATION: Student class attendance (in person), asking and answering questions, and engaging in discussions with subject matter expert faculty are very important parts of the learning curriculum. In this regard, the 30-minute faculty-led discussions and question answering sessions provide students opportunities to develop communication and critical thinking skills. To facilitate discussion, students will be assigned to ask questions for specific lectures, which they can do by raising their hand in class or submitting a question onto Canvas before or during classes. The TA will record attendance and participation and read questions posted to Canvas.

EXAMS: There will be two take-home exams: a mid-term and a final. They are intended to encourage critical thinking about immunology generally, experimental data interpretation, and/or deeper reading of important areas that, because of time constraints, could not be given the coverage that they warrant during lectures. Students will have a week to work on each exam utilizing any materials from class or outside as resources. It is expected that answers will reflect this and will reference appropriate sources. However, students cannot work together to answer the exam questions or ask other persons for help.

ARTICLE CRITIQUE: During the second half of the course, each student will select one primary research article from a selection of papers provided by the course directors. From the selected article, each student will work by themselves to:

- 1- Identify a weakness in a specific experiment and explain why it is a weakness (5 pts).
- 2- Propose two ways to improve that particular experiment (5 pts).
- 3- Describe two additional experiments to verify the conclusions reached by that experiment (10 pts).

This assignment will be due no later than [Wednesday, April 24th](#).

COURSE GRADE: The course grade will be based on: 35% mid-term exam, 35% final exam, 20% article critique, and 10% class participation.

CANVAS: The Course Overview and Syllabus and Janeway's Immunobiology are posted. Reviews and papers recommended by faculty and their lectures will be posted as soon as they are provided, with a requested deadline of one week before the class. The mid-term and final exams and articles for critique will be posted at appropriate times.

Date	Lecture Topic	Faculty Lecturer
Jan 15 - Wed	Introduction to the Immune System	Mike Cancro
Jan 17 - Fri	Introduction to Flow Cytometry	Taylor Miller-Ensminger
	Innate Immunity Section	
Jan 22 - Wed	Complement	Wenchao Song
Jan 27 - Mon	Hematopoiesis and Lymphogenesis	Warren Pear
Jan 29 - Wed	Pattern Recognition and Toll-Like Receptors	Kellie Jurado
Feb 3 - Mon	Monocytes, Macrophages, and Inflammation	Malay Halder
Feb 5 - Wed	Dendritic Cells	Chengcheng Jin
Feb 10 - Mon	Natural Killer, Natural Killer T, and other Innate Lymphoid Cells	Scott Gordon
	Adaptive Immunity Section	
Feb 12 - Wed	Antigen Receptor Gene Diversification	Craig Bassing
Feb 17 - Mon	Immunoglobulin Structure and Function	Dave Allman
Feb 19 - Wed	Antibody Diversification	Craig Bassing
Feb 24 - Mon	B Cell Repertoire Selections/Regulation of B Cell Response	Dave Allman
Feb 26 - Wed	Antigen Processing, Presentation, and Recognition	Ike Eisenlohr
Mar 3 - Mon	Early Thymocyte Development	Craig Bassing
Mar 5 - Wed	MHC Restriction and T Cell Selection	Ike Eisenlohr
Mar 10 - Mon	Th Cell Subsets	Chris Hunter
Mar 12 - Wed	Germinal Center Formation/Tfh Cells	Michela Locci
Mar 17 - Mon	Class-I CD8 T Cells and T Cell Exhaustion	John Wherry
Mar 19 - Wed	No Class, Mid-term Exam Week	
	Integrated Immune Responses Section	
Mar 24 - Mon	Lymphoid Organ Organization and Lymphocyte Trafficking	Mike May
Mar 26 - Wed	Tolerance and Immune Privilege	Paula Oliver
Mar 31 - Mon	Mucosal Immunity and Microbiome	Michael Abt
Apr 2 - Wed	V(D)J Recombination, Antibody Repertoires, etc.	Nina Luning Prak
Apr 4 - Fri	Vaccine Development and Challenges	Norbert Pardi
Apr 7 - Mon	Immune Responses to Gene Therapies	Jonathan Miner
Apr 9 - Wed	Immune Response to HIV	Mike Bets
Apr 16 - Wed	Metabolic Regulation of Immune Responses	Will Bailis
Apr 21 - Mon	Neutrophils in Regulation of Anti-Tumor Immunity	Eventy Eruslanov
Apr 23 - Wed	Anti-Cancer Immune Responses	Joe Fraietta
Apr 28 - Mon	Immune Checkpoint Therapies	Alex Huang
Apr 30 - Wed	Mechanisms Regulating T Cell Immunosurveillance in Cancer	Gregory Beatty
May 5 - Mon	No Class, Final Exam Week	