

MCB 250: **Advanced Immunology** Spring 2014

The course explores the molecular and cellular basis of the immune response with an emphasis on immune responses to infectious disease agents and cancer and diseases resulting from dysregulation of the immune response. The class emphasizes concepts and methodology, and especially the experimental basis for the current understanding of the immune response. The covered topics include innate immunity, pathogen sensors, antibodies and T cell receptors, lymphocyte activation, tolerance and selection, antigen processing, T cell subtypes, and T regulatory cells. NK cells, tumor surveillance, and AIDS. The course is predicated on the notion that microbiology is essential for understanding the immune response, but the material emphasizes the perspective of the host, rather than the perspective of the microbe. The course consists of lectures covering all the major areas of immunological research, and round table discussions in which research papers are dissected in detail in a manner to reveal the experimental approaches and their strengths and shortcomings as well as the conceptual and practical implications of the findings.

Lect	Topic	Date
1	Introduction: overview of immunity	21-Jan
2	Dendritic cells and initiation of immune responses	23-Jan
3	Innate immunity and pattern recognition receptors	28-Jan
4	Cytokine regulation of lymphoid organogenesis and trafficking	30-Jan
	Discussion 1	30-Jan
5	Antibody structure and function	4-Feb
6	V(D)J recombination, class switching, and somatic hypermutation	6-Feb
	Discussion 2	6-Feb
7	Antigen independent and dependent B cell development	11-Feb
8	FcRs and complement – control of antibody responses by innate systems	13-Feb
	Discussion 3	13-Feb
9	Major Histocompatibility Complex (MHC) and T cell Receptor (TCR)	18-Feb
10	Antigen processing and presentation (class II MHC)-Role of DC	20-Feb
	Discussion 4	20-Feb
11	Antigen processing and presentation (class I MHC)	25-Feb
12	TCR-MHC interactions/T cell triggering	27-Feb
	Discussion 5	27-Feb
13	Costimulation - Linking Innate and Adaptive Immunity	4-Mar
14	T cell:B cell interactions in T-dependent antibody responses	6-Mar
	Discussion 6-exam practice	6-Mar
15	T cell dynamics, memory/gamma-delta T cells	11-Mar
16	NK cells and NKT cells	13-Mar
	Discussion 7-EXAM 1	13-Mar
17	Cancer surveillance and immunotherapy	18-Mar
18	T cell activation and signaling	20-Mar
	Discussion 8	20-Mar
19	T cell development I	1-Apr
20	T cell development II	3-Apr
	Discussion 9	3-Apr
21	T cell central tolerance mechanisms	8-Apr
22	T regulatory cells	10-Apr
	Discussion 10	10-Apr
23	Helper T cells and innate lymphoid cells	15-Apr
24	Helper T cells and infection	17-Apr
	Discussion 11	17-Apr
25	Mucosal Immunity	22-Apr
26	Neuro-immunology	24-Apr
	Discussion 12	24-Apr
27	AIDS	29-Apr
28	Autoimmunity	1-May
	Exam practice	8-May
	SECOND EXAM FINALS WEEK Thursday May 15, 2014, 8-11 AM	15-May

(Note, spring break 3/24-3/28)

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Spring 2014 209 DWINELLE

Discussions (110 Barker), Most Thursdays 5-6:00 PM)

In each discussion meeting we have a round table discussion of a single selected research paper concerning an important immunological topic. We dissect the gap the paper intended to fill, the methodology and logic employed to address the question, the strengths and weaknesses of the results in addressing the problem, and the implications.

We emphasize methodological, conceptual and practical aspects of the paper and the field.

Grading (300 points total)

100 pts (33%) EXAM 1 (covering lectures 1-14; discussions 1-5): , Thursday March 13, during discussion

100 pts (33%) EXAM 2 (covering lectures 15-28; discussions 8-12): Thursday May 15, 2014, 8-11 AM

100 pts (33%) Discussion Participation

Accessory Text Book

Murphy ., Janeway's Immunobiology, 8th Edition, Garland, 2011

Library Reserve

BioSciences Library, VLSB