

**CAMB 510: IMMUNOLOGY for CAMB Students**  
**Spring 2012, BRB 252, 10:00-11:30AM**

<b>Date</b>	<b>Day</b>	<b>Topic</b>	<b>Instructor</b>	<b>Abbas Book Chapter</b>
<u>January</u> 1/11	Wed	<b>Introduction To The Immune System: Cells, Organs, and Basic Concepts</b>	C. Hunter	1, 3
1/16	Mon	<i>No class (MLK Day)</i>	-	-
1/18	Wed	<b>Innate Immune System And Innate Immunity I</b>	K. Sullivan	2
1/23	Mon	<b>Innate Immune System And Innate Immunity II</b>	K. Sullivan	2
1/25	Wed	<b>The Major Histocompatibility Complex</b>	A. Wells	5
1/30	Mon	<b>Antigen Processing And Presentation To T Cells</b>	A. Wells	6
<u>February</u> 2/1	Wed	<b>T Cell Development, TCR, And TCR Gene Rearrangement</b>	A. Caton	7, 8
2/6	Mon	<b>B Cell Development And BCR Gene Rearrangement</b>	E. Luning Prak	7, 8
2/8	Wed	<b>Signaling Through Immune System Receptors</b>	G. Koretzky	9
2/13	Mon	<b>Lymphocyte Activation and Differentiation</b>	A. Wells	9, 10
2/15	Wed	<b>Cytokines And T Cell Subsets</b>	P. Scott	12
2/20	Mon	<b>TBA</b>		
2/22	Wed	<i>No class</i>	-	-
2/27	Mon	<b>Mid-Term Exam</b>	-	-
<u>March</u> 2/29	Wed	<i>No class</i>	-	-
3/5	Mon	<i>No class (Spring Break)</i>	-	-
3/7	Wed	<i>No class (Spring Break)</i>	-	-
3/12	Mon	<b>Effector Mechanisms Of Immunity - T cells</b>	A. Wells	13, 18
3/14	Wed	<b>Effector Mechanisms Of Immunity - B cells, Ab, complement</b>	E. Luning Prak	10, 14, 19
3/19	Mon	<b>Immunologic Memory</b>	J. Wherry	9, 10
3/21	Wed	<b>Immunologic Tolerance</b>	Y. Chen	11

3/26	Mon	<b>Autoimmunity</b>	Y. Chen	18
3/28	Wed	<b>Immunity To Viruses</b>	S. Hensley	15
<u>April</u> 4/2	Mon	<b>Immunity To Parasites</b>	C. Hunter	15
4/4	Wed	<b>Immunity To Tumors</b>	Y. Paterson	17
4/9	Mon	<b>Immunity To Tumors</b>	Y. Paterson	17
4/11	Wed	<b>Acquired Immunodeficiency</b>	M. Betts	20
4/16	Mon	<b>Inherited immunodeficiency</b>	K. Sullivan	20
4/18	Wed	<b>Vaccines</b>	P. Offit	15
4/23	Mon	<i>No class</i>	-	-
4/25	Wed	<b>FINAL EXAM</b>	-	-

## COURSE SUMMARY

TITLE: CAMB 510-001 Immunology for CAMB Students

PREREQUISITE: BIOM 600 or instructor permit

DESCRIPTION: The purpose of this course is to give a thorough grounding in Immunology to Cell and Molecular Biology graduate students with an emphasis on the role of the immune system in combating infectious and neoplastic diseases and its role in immunopathological states such as autoimmunity and allergy. This is a required course for CAMB students in the Microbiology, Virology and Parasitology program and the Vaccine and Gene Therapy program, replacing IMMU 506 (Immune Mechanisms). It may also be used as an elective by other CAMB students such as those from the Cancer Biology program and Cell Biology and Physiology program.

The course is divided into two parts. The first deals with innate and adaptive immune mechanisms, the structure, function, and molecular biology of antigen receptors and major histocompatibility complex molecules, and the development, activation, and differentiation of lymphocytes and other hematopoietic cells involved in immunity. The second part will cover the immune response in infection by bacteria, viruses, and parasites, and in pathological states such as cancer, allergy, and autoimmunity. The course is comprised of two 1.5-hour lectures per week.

EXAMS: There will be two exams. The first will be taken after part I, and the second after part II of the course. Both will be open book and in-class exams. The exam will consist of essay or brief answer questions based on experimental design and/or data. Each exam is weighed equally in determining the final letter grades of students. The grades are based solely on the exams.

COURSE WEBSITE: <https://courseweb.library.upenn.edu/>. To access this site, you will need your PENNKEY and password.

**COURSE DIRECTORS:**

**Andrew Wells**, 916E Abramson Research Center, 215-898-1018, [adwells@mail.med.upenn.edu](mailto:adwells@mail.med.upenn.edu)  
**Youhai Chen**, 713 Stellar-Chance Labs, 215-898-4671, [yhc@mail.med.upenn.edu](mailto:yhc@mail.med.upenn.edu)

<b>INSTRUCTOR INFORMATION</b>		
<b>Instructor Name</b>	<b>Email Address</b>	<b>Office Phone #</b>
Andrew J. Caton, Ph.D.	<a href="mailto:caton@wistar.org">caton@wistar.org</a>	215-898-3871
Youhai H. Chen, M.D., Ph.D.	<a href="mailto:yhc@mail.med.upenn.edu">yhc@mail.med.upenn.edu</a>	215-898-4671
Gary Koretzky, M.D., Ph.D.	<a href="mailto:koretzky@mail.med.upenn.edu">koretzky@mail.med.upenn.edu</a>	215-746-5522
Scott Hensley, Ph.D.	<a href="mailto:shensley@wistar.org">shensley@wistar.org</a>	215-495-6864
Christopher A. Hunter, Ph.D.	<a href="mailto:chunter@vet.upenn.edu">chunter@vet.upenn.edu</a>	215-573-7772
Paul Offit, M.D.	<a href="mailto:offit@email.chop.edu">offit@email.chop.edu</a>	215-590-2020
Eline Luning Prak, M.D.	<a href="mailto:luning@mail.med.upenn.edu">luning@mail.med.upenn.edu</a>	215-746-5768
Yvonne J. Paterson, Ph.D.	<a href="mailto:yvonne@mail.med.upenn.edu">yvonne@mail.med.upenn.edu</a>	215-898-3461
Michael R. Betts, Ph.D.	<a href="mailto:betts@mail.med.upenn.edu">betts@mail.med.upenn.edu</a>	215-573-2773
Phillip Scott, Ph.D.	<a href="mailto:pscott@vet.upenn.edu">pscott@vet.upenn.edu</a>	215-898-1602
Kathleen E. Sullivan, M.D., Ph.D.	<a href="mailto:sullivak@mail.med.upenn.edu">sullivak@mail.med.upenn.edu</a>	215-590-1697
Andrew D. Wells, Ph.D.	<a href="mailto:adwells@mail.med.upenn.edu">adwells@mail.med.upenn.edu</a>	215-898-1018
E. John Wherry, Ph.D.	<a href="mailto:wherry@mail.med.upenn.edu">wherry@mail.med.upenn.edu</a>	215-746-8141

**RECOMMENDED TEXTBOOKS:**

Either one of the following books may be used for background readings, and the recommended chapters from the Abbas's book are listed in the Course Schedule. However, it must be emphasized that these are for background readings only, not a replacement for the lecture materials from the instructors. The exams will be based on the materials from the instructors. Each student is responsible for determining how much background readings he/she needs for this course.

1. **CELLULAR AND MOLECULAR IMMUNOLOGY**  
By Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai, Saunders

Section I. Introduction to the Immune System  
Chapter 1. Properties and Overview of Immune Responses  
Chapter 2. Innate Immunity  
Chapter 3. Cells and Tissues of the Adaptive Immune System  
Section II. Recognition of Antigens  
Chapter 4. Antibodies and Antigens  
Chapter 5. The Major Histocompatibility Complex  
Chapter 6. Antigen Processing and Presentation to T Lymphocytes  
Chapter 7. Antigen Receptors and Accessory Molecules of T Lymphocytes  
Section III. Maturation, Activation and Regulation of Lymphocytes  
Chapter 8. Lymphocyte Development and the Rearrangement and Expression of Antigen Receptor Genes  
Chapter 9. Activation of T Lymphocytes  
Chapter 10. B Cell Activation and Antibody Production  
Chapter 11. Immunologic Tolerance  
Section IV. Effector Mechanisms of Immune Responses  
Chapter 12. Cytokines  
Chapter 13. Effector Mechanisms of Cell-Mediated Immunity  
Chapter 14. Effector Mechanisms of Humoral Immunity  
Section V. The Immune System in Defense and Disease  
Chapter 15. Immunity to Microbes  
Chapter 16. Transplantation Immunology  
Chapter 17. Immunity to Tumors  
Chapter 18. Diseases Caused by Immune Responses: Hypersensitivity and Autoimmunity  
Chapter 19. Immediate Hypersensitivity  
Chapter 20. Congenital and Acquired Immunodeficiencies

2. **JANEWAY'S IMMUNOBIOLOGY**  
By K. Murphy, Garland Science

PART I An Introduction to Immunobiology and Innate Immunity  
Chapter 1 Basic Concepts in Immunology  
Chapter 2 Innate Immunity  
PART II The Recognition of Antigen  
Chapter 3 Antigen Recognition by B-cell and T-cell Receptors  
Chapter 4 The Generation of Lymphocyte Antigen Receptors  
Chapter 5 Antigen Presentation to T Lymphocytes  
PART III The Development of Mature Lymphocyte Receptor Repertoires  
Chapter 6 Signaling Through Immune System Receptors  
Chapter 7 The Development and Survival of Lymphocytes  
PART IV The Adaptive Immune Response  
Chapter 8 T Cell-Mediated Immunity  
Chapter 9 The Humoral Immune Response  
Chapter 10 Dynamics of Adaptive Immunity  
Chapter 11 The Mucosal Immune System  
PART V The Immune System in Health and Disease  
Chapter 12 Failures of Host Defense Mechanism  
Chapter 13 Allergy and Hypersensitivity  
Chapter 14 Autoimmunity and Transplantation  
Chapter 15 Manipulation of the Immune Response  
PART VI The Origins of Immune Responses  
Chapter 16 Evolution of the Immune System