

University of Florida
Department of Microbiology and Cell Science

IMMUNOLOGY
PCB 5235 (3 credits)

SPRING SEMESTER 2013

COURSE DESCRIPTION:

PCB 5235 is a comprehensive course in basic immunology designed for graduate students. Emphasis will be placed on fundamental aspects of immunology, and its application to real-world immunological research and concerns. Upon successful completion of the course, students will have a solid immunological information foundation suitable for future educational endeavors in the areas of biomedical research, or human/veterinary clinical applications. In addition, students will have a fundamental understanding of basic immunological experimental design. Student assessments in PCB 5235 will focus heavily on immunological facts, concepts, and problem solving based on the application of concepts. PCB 5235 will be co-taught with PCB 4233.

Prerequisite: MCB 3023 or equivalent. Students lacking prerequisite should consult the instructor prior to enrolling in this course.

INSTRUCTOR
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Dr. Joseph Larkin III
Microbiology & Cell Science Building, Room 1253
Phone: 352-392-6884

OFFICE HOURS:

Mondays and Tuesdays 2:45-3:45
(Note: Students unable to meet these hours may schedule appointments: email jlarkin3@ufl.edu. I will not be available for scheduled appointments on February 28th or April 30th)

WEB PAGE:

E-learning (Sakai) : <https://lss.at.ufl.edu>

LECTURES: Monday, Wednesday, and Friday (4th period) 10:40-11:30 MCCA G186. The majority of lectures administered throughout the semester will be posted on the UF mediasite website after their generation, and can be accessed through the Sakai (under heading **Recorded Lectures**).

Camtasia: Some lectures will be administered via the program Camtasia and will be accessed through Sakai

MATERIALS:

REQUIRED TEXTBOOK:

Kindt T.J., Goldsby R.A., and Osborne B.A. 2007. *Kuby Immunology*. Sixth Edition. W.

H. Freeman and Company, New York. ISBN-13: 978-0-7167-8590-3.

Also please note the website: <http://www.whfreeman.com/immunology6e>. In addition, valuable study tools can also be found at this website.

RECOMMENDED TEXTBOOK:

Murphy, K. 2012. *Janeway's Immunobiology* 8th edition. Garland Science, Taylor & Francis Group, LLC., New York. ISBN 978-0-8153-4243-4

Please note the website below. Essentially all animations used in class can be found on this website.

<http://www.youtube.com/user/garlandscience>

OUTSIDE ASSIGNED READINGS: The following journal articles will supplement class lectures and are available on class website:

Josefowicz SZ, Rudensky A. Control of regulatory T cell lineage commitment and maintenance. *Immunity* 2009; **30**: 616-625.

Izcue A, Coombes JL, Powrie F. Regulatory T cells and intestinal inflammation. *Ann Rev Immunol* 2009; **27**: 313-338.

Sokol CL, et al. Basophils function as antigen presenting cells for an allergen-induced T helper type 2 response. *Nat Immunol* 2009; **10**: 713-720.

Tussiwand R, et al. Tolerance checkpoints in B cell development: Johnny B good. *Eur J Immunol* 2009; **39**: 2317-2324.

Allers K, et al. Evidence for the cure of HIV infection by CCR5 $\Delta 32/\Delta 32$ stem cell transplantation. *Blood* 2010; doi:10.1182/blood-2010-09-309591.

Raison CL, et al. Inflammation, Sanitation, and Consternation. *Arch Gen Psychiatry* 2010; 67(12):1211-1224.

PUNCTUALITY: Class will begin promptly at 10:40 a.m. Please be on time and seated, with your cell phone turned off. Should you arrive late to class, please use the doors located at the rear of the room.

STUDENT LEARNING OUTCOMES: Upon successful completion students will -

- Be able to clearly state the role of the immune system
- Be able to compare and contrast the innate versus adaptive immune systems.
- Be able to articulate the roles of Toll-Like Receptors in the innate and adaptive immune responses and specifically identify select receptors.
- Be able to compare and contrast humoral versus cell-mediated immune responses.
- Be able to distinguish various cell types involved in immune responses and associated functions
- Be able to distinguish and characterize CD4⁺ T helper cell lineages TH1, TH2, TH17,

and regulatory T cell (Treg).

- Be able to distinguish and characterize antibody isotypes, development, and functions.
- Understand the role of cytokines in immunity and immune cell activation; and be able to identify and characterize cytokines of particular immune importance.
- Understand the significance the Major Histocompatibility Complex in terms of immune response and transplantation.
- Be able to describe lymphocyte development and the expression of antigen receptors.
- Be able to characterize processes utilized by the immune system to mediate tolerance to self tissues
- Understand current scientific knowledge related to autoimmune disease etiologies
- Be able to articulate the ramifications of immunodeficiency with particular emphasis on acquired immunodeficiency.

STUDENT EVALUATION:

Class Attendance is strongly encouraged. Students are expected to read the Chapter in Kuby Immunology corresponding to lecture *prior* to the lecture. Students will at random be asked to participate in discussions pertaining to prior readings, lectures, and online Assignments.

Online Projects

Online projects will be based on outside readings, the text, and the lectures. Online assessments will involve experimental design and critical review of journal articles. Online projects will be available on the course website in Sakai, with due dates are listed below. There will be 5 assignments, due at 10pm on their respective due dates. Each Online Project will be worth twenty points each for a total of 100 points.

Project 1	Tuesday 1/15/13
Project 2	Tuesday 1/29/12
Project 3	Tuesday 2/19/13
Project 4	Tuesday 3/12/13
Project 5	Tuesday 4/23/13

Discussions

Peer to Peer interactions play an important role in the learning process. In order to facilitate these interactions, **6 discussions will be assigned**. Discussion entries will be due at 10pm of the dates listed below. Four of these discussions will involve the generation of a practice exam. Significantly, some questions posted on the discussion board will likely be used on the exams. Therefore, it is to the advantage of all students to review the questions posted on the student designed study guides. *Successful completion of 5/6 discussion will result in 5 points extra credit*

Discussion #1	Friday 1/18/13
Discussion #2	Friday 2/01/13
Discussion #3	Friday 2/22/13
Discussion #4	Friday 3/15/13
Discussion #5	Friday 4/12/13
Discussion #6	Friday 4/26/13

Pre-Exam

In preparation for future exams, a 15 question pre-exam, providing the types of questions on exams and an overview of the material covered in the class, must be completed by **Friday, January 11, 2013 at 10pm**. The pre-exam also allows the instructor to gauge pre-knowledge of immunology. Participation in the pre-exam will require accessing pretest in the Sakai website. Preparation for the pretest is not required (or expected) as **participation in the pre-exam will result in 10 points** of your final grade.

Examinations

Three (3) fifty minute In-Class exams (180 points each for a total of 540 points) will be administered consisting of varied question format. Although each exam will focus on a particular period of instruction, given the nature of the subject matter, all examinations will be cumulative. Questions will be related to all lectures given in the class, including guest lectures. Makeup exams will be given only with advanced written permission, from the instructor, under the most *extreme* circumstances. Only cases of serious illness, bereavement, or activities that fall under the Twelve-Day rule will be considered for makeup. *Makeup exams will be written (no multiple choice)*. You must provide official documentation for all cases. Please note: Professional Schools **will** reschedule interviews, if they conflict with an exam. Take care of conflicts and other problems immediately. The Instructor reserves the right to utilize **Proctor U** for makeup exams **at cost to students**.

A mandatory cumulative final examination (350 points) will be administered on Wednesday, May 1st, 3:00 p.m.-5:00 p.m. during final exams week. There is no make up for the final.

We also request that students utilize restroom facilities prior to exam sessions so that restroom usage will not occur during examination period.

PLEASE NOTE THAT EXAMS FOR PCB5235 WILL BE HELD IN THE MICROBIOLOGY BUILDING (to be discussed in more detail)

Grading Format:

Online Projects	5@20 points each	100	points
Pretest		10	points
In-Class Exams	3@180 pts/each	540	points
<u>Final Examination</u>		<u>350</u>	<u>points</u>
Total		1000	points

Final grades will be based on the following performance standard (1000 points total):

920 - 1000 points	=	A
900 - 919 points		A-
870 - 899 points	=	B+
830 - 869 points	=	B
800 - 829 points	=	B-

760 - 799 points	=	C+
700 - 759 points	=	C
650 - 699 points	=	D+
600 – 649 points	=	D
Less than 600 points	=	E

For questions regarding University of Florida Grading Policies please consult:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

COURSE SCHEDULE:

<u>Week 1</u>	Lect. #		
M 01/07	1	Class Intro/ Historical Perspectives	chapter 1
W 01/09	2	Introduction to Immunity	chapter 1,2
F 01/11	3	Hematopoiesis	chapter 2
<u>Week 2</u>			
M 01/14	4	Cells of the immune system	chapter 2
W 01/16	5	lymphoid organs and lymphatics	chapter 2
F 01/18	6	Adaptive immune response I	chapter 2
<u>Week 3</u>			
M 01/21		No Class (Martin Luther King, Jr. observed)	
W 01/23	7	Adaptive immune response II	chapter 2
F 01/25	8	Innate immunity	chapter 3
<u>Week 4</u>			
M 01/28	9	Innate immunity	chapter 3
W 01/30	10	Innate immunity	chapter 3
F 02/01		Review (chapters 1-3)	
<u>Week 5</u>			
M 02/04		Exam 1 (chapters 1-3)	
W 02/06	11	Antigens and antibodies	chapter 4
F 02/08	12	Antigens and antibodies	chapter 4
<u>Week 6</u>			
M 02/11	13	Antibody structure	chapter 4
W 02/13	14	Organization and expression of Ig genes	chapter 5
F 02/15	15	Immunoglobulin recombination	chapter 5
<u>Week 7</u>			
M 02/18	16	Immunoglobulin recombination	chapter 5
W 02/20	17	Antigen/antibody interactions	chapter 6
F 02/22	18	Antigen/antibody interactions	chapter 6
<u>Week 8</u>			
M 02/25	19	Catch up	
W 02/27		Review (chapters 4-6)	
F 03/01		Exam 2 (chapters 4-6)	
<u>Week 9</u>			
M 03/04		No Class	
W 03/06		No Class	
F 03/08		No Class	
<u>Week10</u>			
M 03/11	20	Experimental Techniques	Chapter 22

W 03/13	21	Introduction to Complement	Chapter 7
F 03/15	22	Mechanisms/regulation of complement	Chapter 7 Dr. Hoffmann
<u>Week 11</u>			
M 03/18	23	Defects in complement pathway	Chapter 7
W 03/20	24	Antigen Presentation/MHC	Chapter 8
F 03/22	25	Antigen Presentation/MHC	Chapter 8
<u>Week 12</u>			
M 03/25	26	Antigen Presentation/MHC	Chapter 8
W 03/27	27	T cell development and function	Chapter 9,10
F 03/29	28	T cell development and function	Chapter 9, 10
<u>Week 13</u>			
M 04/01	29	T cell development and function	Chapter 9, 10
W 04/03	30	Host response to Parasites	Dr. P. Kima
F 04/05	31	Mucosal Immunology	Dr. Volker Mai
<u>Week 14</u>			
M 04/08	32	Mucosal Immunology II	Dr. Langkamp-Henken
W 04/10		NKT cells	Dr. Percival
F 04/12		Review	
<u>Week 15</u>			
M 04/15		Exam 3 (chapter 7-9, 22)	
W 04/17	33	Immunity and HIV	Dr. Yamamoto
F 04/19	34	T cell maturation/activation/diff	Chapter 10
<u>Week 16</u>			
M 04/22	35	T cell maturation/activation/diff	Chapter 10
W 04/24		Review Session	

Cumulative Final exam: Wednesday, May 1st, 3:00 p.m.-5:00 p.m.

Academic Honesty, Software Use, UF Counseling Services, Services for Students with Disabilities

In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

(Source: 2009-2010 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. Both the Counseling Center and Student Mental Health Services provide confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health Services is located on the second floor of the Student Health Care Center in the Infirmary.

- *University Counseling Center*, 301 Peabody Hall, 392-1575, www.counsel.ufl.edu
- *Career Resource Center*, CR-100 JWRU, 392-1601 ext: 0, www.crc.ufl.edu/
- *Student Mental Health Services*, Rm. 245 Student Health Care Center, 392-1171, www.shcc.ufl.edu/smhs/

Alcohol and Substance Abuse Program (ASAP)

Attention Deficit Hyperactivity Disorder (ADHD)

Center for Sexual Assault / Abuse Recovery & Education (CARE)

Eating Disorders Program

Employee Assistance Program

Suicide Prevention Program

Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 392-8565, www.dso.ufl.edu/drc/