

University of Florida
Department of Microbiology and Cell Science

IMMUNOLOGY
PCB 5235 (3 credits)

SPRING SEMESTER 2023

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

Dr. Joseph Larkin III

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MCS Building, Room 1253 (all office hours by Zoom)

OFFICE HOURS:

Phone: 352-392-6884

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 Jan 26th, Feb 16th, or April 20th)

TAs:

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BEST WAY TO CONTACT: Email through canvas

WEB PAGE:
E-learning (Canvas)

LECTURES: Monday, Wednesday, and Friday (4th period) 10:40-11:30 Microbiology and Cell Science Seminar Room or Zoom. Zoom lectures will be recorded and available asynchronously accessed on canvas.

MATERIALS:

COURSE REQUIREMENT:

Achieve for Owen, Punt, Stranford. 2019, *Kuby Immunology, Eight Edition. Macmillan Learning, New York.*

Please access materials through All Access connected to Immunology Canvas Website

Please note the website below. Many 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 Δ 32/ Δ 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 of 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

We will be utilizing the Hy-Flex method of teaching this semester. Lectures will be available Live-Brick (Microbiology and Cell Science seminar room) and Mortar, Live-Zoom (available through Canvas), and asynchronous recorded Zoom Lectures. Remaining current in the class is strongly encouraged

CT- No physical class (camtasia or pre-recorded lecture)

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

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

Online Assignments/"Quizzes"

Open book Assignments "Quizzes" are located within the quiz section eLearning. No Proctoring will be involved in the completion of open book assignments. You will have 10 assignments to complete. Each one is worth 5 points for a total of 50 points. The due dates are listed below.

Assignment 1 - Section 1	Tuesday	1/17/23
Assignment 2 - Section 2	Tuesday	1/17/22
Assignment 3 - Sections 3&4	Tuesday	1/31/22
Assignment 4 - Sections 4&5	Tuesday	2/07/23
Assignment 5 - Section 6	Tuesday	2/21/23
Assignment 6 - Section 7	Tuesday	2/28/23
Assignment 7 - Section 8	Tuesday	3/07/23
Assignment 8 - Sections 9&10	Tuesday	3/28/23
Assignment 9 - Section 11	Tuesday	4/04/23
Assignment 10 - Sections 12&13	Tuesday	4/18/23

Pretest

A pretest will be assigned at the beginning of the course to serve as a diagnostic test. It will not negatively contribute to your grade and is purely for diagnostic purposes. Completion will result in 10 points."

Adaptive Quizzes

The goal of adaptive quizzes is to assist in preparation for exams. They are in Macmillan adaptive

Chapter 1 adaptive quiz	Jan 19th
Chapter 2 adaptive quiz	Feb 9th
Chapter 3 adaptive quiz	Feb 23rd
Chapter 4 adaptive quiz	Mar 2nd
Chapter 20 adaptive quiz	Mar 9th
Chapter 5 adaptive quiz	Mar 30th
Chapter 6 adaptive quiz	Apr 6th
Chapter 7 adaptive quiz	Apr 11th
Chapter 8 adaptive quiz	Apr 20th
Chapter 10 adaptive quiz	Apr 24th

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 canvas, with due dates listed below. There will be 4 assignments due at 10pm on their respective due dates. Each Online Project will be worth twenty-five points each for a total of 100 points.

Project 1	Monday 1/23/23
Project 2	Monday 2/27/23
Project 3	Monday 3/27/23
Project 4	Monday 4/17/23

Examinations

Four (4) computer based, fifty minute exams will be administered, consisting of approximately 30 multiple choice-format. The best 3 of the 4 exams will be utilized to calculate class grade (180 points each for a total of 540 points, with the lowest grade excluded from grade calculation.

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.

Exams will be administered through Honorlock. Exams will open at 6am on the day assigned and close at 11pm the following day, giving approximately a two-day window. It is expected that cameras remain active and functional during entire exam.

Makeup policy: Students will be directed to <https://care.dso.ufl.edu/instructor-notifications/> for approval to make up missed assignments. Exams will be given only with advanced written permission from the instructor. Only cases of serious illness, bereavement, or activities that fall under the Twelve-Day rule will be considered for makeup. You must provide official documentation for all cases. *A missed (in semester) exam, without appropriate instructor approval, will be considered the lowest exam grade and excluded from grade calculation.*

Please note: Professional Schools **will** reschedule interviews if they conflict with an exam. Take care of conflicts and other problems immediately.

A mandatory cumulative 2hr. final examination (250 points) will be administered. The exam will be available from Monday, May 1st at 6am to Tuesday, May 2nd at 10pm during final exams week. There is no make up for the final.

Exam Review Policy

Students are permitted to view previous exam results during appointments or office hours. Exam viewings for previous exams are available until the next exam is issued. At that time more distant exams are no longer available

Grading Format:

Pretest		10	points
Adaptive quizzes (open resource)	10@5points each	50	points
Assignments	10@5 points each	50	points
Online Projects	4@ 25 points each	100	points
In-Class Exams	3@180 points each	540	points
Final Examination		250	points
Total		1000	points

Extra Credit: Opportunities for small amounts of extra credit will be available throughout the semester

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

890 - 1030 points	=	A
860 - 889 points	=	A-
830 - 859 points	=	B+
800 - 829 points	=	B
770 – 799 points	=	B-
730 - 769 points	=	C+
670 - 729 points	=	C
620 - 699 points	=	D+
570 – 620 points	=	D
Less than 570 points	=	E

For questions regarding University of Florida Grading Policies please consult:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Cumulative Final exam: Monday, May 1stth 6am – Tuesday May 2nd 10pm

LECTURE SCHEDULE

Week	Day	Date	Lecture	Topic	PPT
1	M	1/9	1	Class Intro + Overview	1
	W	1/11	2	Historical Development	1
	F	1/13	3	Innate Immunity	2
2	M	1/16		No Class (MLK Day Observed)	
	W	1/18	4	Adaptive Immunity	3
	F	1/20	5	Cells of the Immune System	3
3	M	1/23	6	Cells of the Immune System	3
	W	1/25	7	Hematopoiesis	4

	F	1/27		Exam1-No class	
4	M	1/30	8	Hematopoiesis	4
	W	2/1	9	Immune System Organs/Lymphatics	4
	F	2/3	10	Immune System Organs/Lymphatics	5
5	M	2/6	11	Lymphatics	5
	W	2/8	12	Adaptive Immune System	5
	F	2/10	13	T and B lymphocytes	
6	M	2/13	14	Immune Dysfunction	6
	W	2/15		Exam 2-No Class	
	F	2/17	15	Receptors, Signaling, Antibodies	6
7	M	2/20	16	Receptors, Signaling, Antibodies	7
	W	2/22	17	Receptors, Signaling, Antibodies	7
	F	2/24	18	Receptors, Signaling, Ab + Cytokines	7
8	M	2/27	19	Cytokines,	7
	W	3/1	20	Cytokines, innate Immunity	8
	F	3/3	21	Innate Immunity	
9	M	3/6	22	Experimental Systems	8
	W	3/8	23	Experimental Systems	9
	F	3/10	24	Experimental Systems	9
10	M	3/13		SPRING BREAK (no Class)	
	W	3/15		SPRING BREAK (no Class)	
	F	3/17		SPRING BREAK (no Class)	
11	M	3/20		Exam 3 – No Class	
	W	3/22	25	Guest Lecture: Dr. Hoffman (Complement) (rec)	11
	F	3/24	26	Guest Lecture: Dr. Hoffman (Complement) (rec)	11
12	M	3/27	27	Larkin Complement Review	11
	W	3/29	28	Ig Organization and Expression	11
	F	3/31	29	Ig Organization and Expression	11
13	M	4/3	30	Ig Organization and Expression	
	W	4/5	31	MHC	
	F	4/7	32	MHC	
14	M	4/10	33	MHC	
	W	4/12		Exam 4 – No Class	12
	F	4/14	34	Guest lecture (rec)	12
15	M	4/17	35	Guest lecture (rec)	12
	W	4/19	36	Guest lecture (rec)	13
	F	4/21	37	T Cell Development	13
16	M	4/24	38	T Cell Development/course wrap up	14
	W	4/26		Reading Day _No Class	
		5/1- 5/2		Cumulative Final exam	

NOTES: Some components regarding the schedule are subject to change based on how the class is flowing. Exams have been set on the aforementioned dates regardless of content covered; however, exam material will be adjusted to reflect the covered content

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

Privacy Statement

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

The university's honesty policy regarding cheating, plagiarism, etc.

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Honor Code](#). Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

University Police Department: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#)

Academic Resources

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

On-Line Students Complaints: [View the Distance Learning Student Complaint Process.](#)

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.

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/

honesty policy regarding cheating, plagiarism, etc.

