



# THE OHIO STATE UNIVERSITY

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## SYLLABUS

College of Medicine

Department of Microbial Infection and Immunity

### **MEDMCIM 7010: Molecular and Cellular Immunology**

**Course Directors:** Purnima Dubey, PhD, and Hazem Ghoneim, PhD

#### **Additional Instructors:**

Michael Bailey  
Prosper Boyaka  
Jon Butchar  
Patrick Collins  
Adriana Forero  
Emily Hemann  
Namal Liyanage  
Chan-Wang (Jerry) Lio  
Matthew Long  
Amy Lovett-Racke  
Ken Oestreich  
Eugene Oltz  
Steve Oghumu  
Santiago Partida-Sanchez  
Murugesan Rajaram  
Stephanie Seveau  
Ruoning Wang  
Haitao Wen  
Gang Xin  
Chack-Yung Yu

Email address (**preferred** contact method): Purnima.dubey@osumc.edu; Hazem.ghoneim@osumc.edu

Phone number: 614-292-9447 (Dubey office); 614-293-9608 (Ghoneim office).

Office hours: By appointment with the course directors

#### Class Meeting Schedule:

Class will meet in person in DHLRI, Room 165

M, W, F: 1:50pm – 2:45pm

Course Policies:

Attendance is mandatory. In case of an unavoidable conflict, contact the course directors for permission to miss a class.

Course Description:

Using didactic teaching, and in-class discussion, this course provides students with an understanding of basic immunological concepts. The lectures describe the various components of the innate and adaptive immune systems to provide the student with a detailed understanding of the development and function of individual immune components and their interactions in concert. This course is team taught by faculty experts.

Prerequisites:

BSGP 8050 and BSGP 7000 or permission of course directors.

Course Learning Objectives:

By the end of this course, students should successfully be able to:

1. Identify the innate and adaptive immune cell populations
2. Understand the development and cross-talk of the immune system
3. Understand how the host immune system responds to pathogens, allergens, or cancer

**Mode of delivery:** Face-to-face instruction.

**Pace of online activities:** The course meets three times per week for 55 minutes

**Credit hours and work expectations:** This is a **3-credit-hour course**. According to Ohio State policy ([go.osu.edu/credithours](http://go.osu.edu/credithours)), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) and 3 hours of material review.

**Attendance and participation requirements:** Students are required to attend all lectures. If you have a situation that might cause you to miss an entire class session, discuss it with the Course Director *as soon as possible*.

**COURSE MATERIALS AND TECHNOLOGIES**

## Textbooks

No textbooks are required.

Recommended textbook for further reading: Abbas et al, *Cellular and Molecular Immunology*, and Janeway's *Immunobiology* textbook (10<sup>th</sup> edition).

## Other fees or requirements

No additional course fees are required

## Course technology

### Technology support

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at [ocio.osu.edu/help/hours](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** [ocio.osu.edu/help](https://ocio.osu.edu/help)
- **Phone:** 614-688-4357(HELP)
- **Email:** [servicedesk@osu.edu](mailto:servicedesk@osu.edu)
- **TDD:** 614-688-8743

### Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen ([go.osu.edu/canvasstudent](https://go.osu.edu/canvasstudent))

### Required equipment

- Computer: current Mac (MacOs) or PC (Windows 10) with high-speed internet connection
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

### Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Full instructions for downloading and installation are at [go.osu.edu/office365help](https://go.osu.edu/office365help).

### Carmen access

You will need to use BuckeyePass ([buckeyepass.osu.edu](http://buckeyepass.osu.edu)) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, we recommend the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions ([go.osu.edu/add-device](http://go.osu.edu/add-device)).
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application ([go.osu.edu/install-duo](http://go.osu.edu/install-duo)) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

## GRADING

**Grading:** The course has three exams which will be administered via an online exam software. The final course grade will be an average of all three exams. The 3<sup>rd</sup> exam will be administered on the University determined final exam date for the course.

Letter grades will be assigned as follows based on the average of the 3 exams:

93-100	A
90	A-
87	B+
83	B
80	B-
77	C+
73	C
70	C-
67	D+
60	D
<60	F

## Instructor feedback and response time

- **Email:** The course directors will reply to messages on the preferred contact emails within 48 hours on days when class is in session at the university.

## OTHER COURSE POLICIES

### Academic integrity policy

#### Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's *Code of Student Conduct* ([studentconduct.osu.edu](http://studentconduct.osu.edu)), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

**If we suspect academic misconduct in this course, university rules obligate us to report suspicions to the Committee on Academic Misconduct.** If COAM determines that you have violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact the course directors.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct web page ([go.osu.edu/coam](http://go.osu.edu/coam))
- Ten Suggestions for Preserving Academic Integrity ([go.osu.edu/ten-suggestions](http://go.osu.edu/ten-suggestions))
- Eight Cardinal Rules of Academic Integrity ([go.osu.edu/cardinal-rules](http://go.osu.edu/cardinal-rules))

**Copyright for instructional materials (required)**

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

### **Statement on Title IX**

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at [titleix.osu.edu](https://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu). Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit [equity.osu.edu](https://equity.osu.edu) or email [equity@osu.edu](mailto:equity@osu.edu).

### **Commitment to a diverse and inclusive learning environment**

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

### **Your mental health**

As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, and feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities.

No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand resources are available at [go.osu.edu/ccsondemand](https://go.osu.edu/ccsondemand). You can reach an on-call counselor when CCS is closed at 614- 292-5766, and 24-hour emergency help is available through the 24/7 National Prevention Hotline at 1-800-273-TALK or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org). The Ohio State Wellness app is also a great resource available at [go.osu.edu/wellnessapp](https://go.osu.edu/wellnessapp).

## **ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

### **Requesting accommodations**

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, arrange with the course directors as soon as possible to discuss your accommodations. **SLDS contact information:** [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

### **Accessibility of course technology**

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Canvas accessibility ([go.osu.edu/canvas-accessibility](https://go.osu.edu/canvas-accessibility))
- Streaming audio and video

**Safety and health requirements:** All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a facemask in any indoor space and maintaining a safe physical distance at all times. Non-compliant students will first receive a warning and disciplinary actions may follow for repeated offenses.

**Conduct in the Classroom and Academic Learning Environment:** Students will adhere to the code of student conduct for The Ohio State University at all times.

**COURSE SCHEDULE (REFER TO THE CARMEN COURSE FOR THE MOST UP-TO-DATE INFORMATION)**

<b>Date</b>	<b>Day</b>	<b>Lecture</b>	<b>Topic</b>	<b>Instructor</b>
9-Jan	M	1	Intro/ Innate Immunity	Ghoneim/Seveau
11-Jan	W	2	Anatomy of Lymphoid Organs	Seveau
13-Jan	F	3	Inflammation and cell trafficking	Long
16-Jan	M		<b>MLK Day holiday</b>	
18-Jan	W	4	Defensins and antimicrobial peptides	Partida-Sanchez
20-Jan	F	5	Neutrophils	Partida-Sanchez
23-Jan	M	6	Macrophages	Xin
25-Jan	W	7	Natural Killer cells	Collins
27-Jan	F	8	Chemokines and chemokine receptors	Oghumu
30-Jan	M	9	Cytokines and cytokine receptors	Forero
1-Feb	W	10	Pattern recognition receptors-1	Wen
3-Feb	F	11	Pattern recognition receptors-2	Wen
6-Feb	M	12	MHC Structure, function and Genetics	Hemann
8-Feb	W	13	Dendritic cells	Dubey
10-Feb	F	14	Antigen processing and presentation	Lovett-Racke
13-Feb	M	15	<b>Exam 1 review session</b>	Dubey and Ghoneim
<b>15-Feb</b>	<b>W</b>	<b>1:30-3:00 pm</b>	<b>Exam 1 (Lectures 1-13)</b>	



17-Feb	F	16	Antibody structure and function	Wieland
20-Feb	M	17	Fc receptor signaling	Butchar
22-Feb	W	18	Complement-1	Yu
24-Feb	F	19	Complement-2	Yu ***Location: M100 Starling Loving
27-Feb	M	20	B cell maturation and activation	Lio
1-Mar	W	21	T cell maturation	Dubey
3-Mar	F	22	Antigen receptor gene rearrangement and class switch recombination	Oltz
6-Mar	M	23	T cell activation	Ghoneim
8-Mar	W	24	T helper cell subsets	Oestreich
10-Mar	F	25	CD8 T cell differentiation and exhaustion	Ghoneim
13-Mar	M		Spring break	
15-Mar	W		Spring break	
17-Mar	F		Spring break	

20-Mar	M	26	Tolerance and Clonal Deletion	Lovett-Racke
22-Mar	W	27	Autoimmunity	Lovett-Racke
24-Mar	F	28	<b>Exam 2 review session</b>	Dubey and Ghoneim
<b>27-Mar</b>	<b>M</b>	<b>1:30-3:00 pm</b>	<b>Exam 2 (Lectures 14-26)</b>	
29-Mar	W	29	Transplant Immunology	Dubey
31-Mar	F	30	Tumor Immunology	Dubey
3-Apr	M	31	Innate Lymphoid Cells	Collins
5-Apr	W	32	Mucosal Immunology	Rajaram
7-Apr	F	33	Metabolic Regulation of Immunity	Wang
10-Apr	M	34	Immune memory/Trained immunity	Liyanage
12-Apr	W	35	Neuroendocrine immunology	Bailey
14-Apr	F	36	Systems Immunology	Oltz
17-Apr	M	37	Human Immunology	Ghoneim
19-Apr	W	38	Vaccines	Boyaka
21-Apr	F	39	Allergy and hypersensitivity	Boyaka
24-Apr	M	40	Immunological Techniques	Oestreich
<b>3-May</b>	<b>Tue</b>	<b>4:00-5:45 pm</b>	<b>Exam 3 (Lectures 27-40)</b>	

