

## IMM250H1S “IMMUNITY AND INFECTION” – Winter 2018

Students will be introduced to the basic concepts of immunity to infectious disease. We will trace the history of current ideas in immunology by examining how bacteria and viruses cause disease and the initial discoveries that led to such developments as vaccination. Current topical and newsworthy infectious diseases (HIV, Ebola, avian flu, Sepsis) will be used as examples of how the immune system copes with microbial infections and how breakdown of the immune response can lead to diseases such as autoimmunity.

IMM250 is a required course for all immunology programs, however it is designed to fulfill breadth requirements and is an appropriate choice for students in other science or humanities programs. Development of writing skills through the composition of a science article for the general public is one objective of this course.

**Recommended Preparation:** BIO120H, BIO130H

### COURSE DATES AND POLICIES

**Class time:** Wednesdays, 9am-11am, Location: Convocation Hall

#### Course coordinators and lecturers:

Dr. Dana Philpott: [dana.philpott@utoronto.ca](mailto:dana.philpott@utoronto.ca)

Dr. Jennifer Gommerman: [jen.gommerman@utoronto.ca](mailto:jen.gommerman@utoronto.ca)

#### Course administrator and contact person:

Dr. Liliana Clemenza [liliana.clemenza@utoronto.ca](mailto:liliana.clemenza@utoronto.ca)

Office hours: Mondays 12:30-2:30pm, room MSB 7267. Please email in advance for appointment. Other meeting arrangements can be made upon request.

All postings (lecture material and announcements) will be done on Blackboard.

Please check the Portal regularly

#### Guest Lecturer:

Dr. Tania Watts

#### In-class response system and interactive textbook

We will be using the **custom-built interactive Immunology 250 course pack** within Top Hat for this class. In addition, we will be using the Top Hat classroom response system during tutorials ([www.tophat.com](http://www.tophat.com)). You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message.

You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center

which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

Top Hat will require a paid subscription; for example a one-term subscription is \$26 for use across all your courses that use the Top Hat system. A full breakdown of all subscription options available can be found here: [www.tophat.com/pricing](http://www.tophat.com/pricing). After you pick your subscription, your textbook will be applied at checkout for an additional \$20. The course content will be made available to you as we progress through the semester.

Should you require assistance with Top Hat at any time,, please contact their Support Team directly by either email ([support@tophat.com](mailto:support@tophat.com)), the in-app support button, or by calling 1-888-663-5491. They will require your specific user information to troubleshoot any issues.

**\*Note: The Top Hat subscription and the purchase of the interactive textbook are NOT mandatory. However, a small percentage (5%) of the course grades will be allocated for participation in the in-class response system and in the interactive textbook. 70% of Top Hat activity (readings and submission of the questions embedded in the textbook) is required in order to qualify for the 5% bonus. If you do not wish to register as a Top Hat user or if you do not meet the minimum participation requirement, the 5% grade for interactive participation will be allocated to percentage weighting of your final exam (See table below)**

	With Top Hat	Without Top Hat
Midterm	30%	30%
Paper or online test	20%	20%
In-class participation	5%	0%
Final exam	45%	50%

### Evaluation Summary and Event Dates:

**1. Midterm Test: Weight 30%** (multiple-choice questions), it will include the first 4 lectures.

Time: **Wednesday February 7 2018, 9am-11am**

Location: Exam Centre, rooms: TBA, 255 McCaul Street.

**Last day to drop courses with 'S' section codes: March 14, 2018**

**2. Assignment (term paper) or online Test- Weight 20%. Time: March 12 2018.**

A "Science & Society" paper is usually part of the assessment tools for this course. In lieu of this, we may have an online multiple-choice test. More information to follow.

**3. Final Exam: Weight 50% (or 45% see table above).** Date and location will be

announced. The format of the final exam is multiple-choice and cumulative but biased towards the second part of the course.

**Deferred Exam**

Students who miss the final exam for a valid reason may petition to the Faculty of Arts and Science to write the deferred exam. **The format of the deferred exam is written short-answer questions and is cumulative.**

**Tutorials: TBA**

**Missed Term Test Policy**

If a term test is missed due to illness, then:

1. The student must obtain the University of Toronto ‘Verification of Student Illness or Injury form’, have it filled out by their Physician, Surgeon, Nurse Practitioner, Registered Psychologist, or Dentist, and submit it to the Immunology Office (Room 7205, Medical Sciences Building), within one week of the missed exam. Forms submitted by email will not be accepted.

2. **If** the note confirms that the student was incapacitated on the day of the test, **then** the weighting of the students other graded work (including the final exam) will be increased by the amount of the missed test.

**If** the note does not confirm that the student was incapacitated on the date of the test, **then** a grade of “0” will be assigned for the test.

**THERE ARE NO MAKE UP MID-TERM TESTS**

**LECTURE OVERVIEW**

Date	Lecture	Lecturer
January 10	Course Business/History and overview of the immune response	Philpott
January 17	<b>Innate Immunity: the first line of defense to infection</b> Types of pathogens; mechanisms of pathogenicity Case study - <b>Helicobacter pylori, Barry Marshall and his self-induced infection</b> Overview of the immune response Steps of innate immunity Recognition of pathogens: sensing infection: Pattern recognition receptors and activation of innate cells	Philpott
January 24	<b>Innate immunity: the first line of defense to infection</b> Soluble and cellular mediators of innate	Philpott

	<p>immunity:</p> <ul style="list-style-type: none"> <li>- cytokines, complement</li> <li>- Phagocytes and other cells of the innate immune system</li> </ul> <p>Case study - <b>Phagocyte disorders: Chronic granulomatous disease</b> Inflammation and how the innate immune response develops</p> <p>Case study - <b>Septic shock: when the immune response goes out of control</b></p>	
January 31	<p><b>Immunology of the gastrointestinal tract - Anatomical and chemical barriers to intruders</b></p> <p>Immune function of epithelial cells Keeping microbial growth in check through stratification in the gut lumen: mucus and mucins, defensins, IgA Breaking through the barriers: <b>Salmonella infection</b> Gut microbiota-immune system crosstalk; Case study - <b>Losing tolerance to gut microbiota: Crohn's disease</b></p>	Philpott
<b>February 7</b>	<b>Midterm</b>	
February 14	Overview of the adaptive immune response: Characteristics of adaptive immunity; general features of lymphocyte biology. Recognition of antigens.	Gommerman
February 21	No class – reading week	
February 28	<p><b>Forming the army - Growing an Adaptive Immune System</b></p> <p>The lecture includes a basic introduction to the adaptive immune system and how B and T cells develop. Case Study: <b>A Human example of immunodeficiency.</b></p>	Gommerman
March 7	<p><b>Equipping the Army: The role of Antibodies in Host Defense and Medicine</b></p> <p>How antibodies are generated. How antibodies are fine-tuned for function</p> <p>Antibody effector functions: How antibodies work</p>	Gommerman

	<p>What is a monoclonal antibody and why is it so special? Case study: <b>Treatment of lymphoma with Rituximab</b></p> <p>Case study: <b>Grace's story - hu3F8</b></p>	
<b>Monday March 12</b>	<b>Paper submission deadline or online test</b>	
March 14	<p><b>Influenza infection:</b> description of viral types, pathogenesis, pandemics in history, H5N1 flu, vaccines</p>	Watts
March 21	<p><b>Coordinating the Battle Field - Lymph nodes are designed to support the adaptive immune responses.</b> The structure of lymphoid organs and mechanisms of lymphocyte trafficking are explained.</p> <p>Case study: <b>Lymphoma</b></p>	Gommerman
March 28	<p><b>Retreat! - How to regulate the adaptive immune response</b> Adaptive immune responses can go rogue. This lecture deals with how the immune system keeps itself in check. Case study: <b>Multiple sclerosis</b></p>	Gommerman
April 4	Review class	Clemenza