

### IMM 428H/1428H Molecular Immunology 2019

*This course will focus on the molecular and cellular biology of immune recognition. The course will emphasize historical and recent experimental evidence leading to our current understanding of immune recognition. Undergraduate students will be graded on two non-cumulative term tests worth 32% each and a 36% non-cumulative final exam. Graduate students will have an additional essay component- see below. All exams are long answer and emphasize problem solving and critical thinking. **Term tests are held in class as indicated in the calendar. The final exam in the December exam period. TBA.***

*All classes will be held in room 2170 MS Tuesday/Thursday 10:10 am -11 am*

*Term test 1 and 2 will be 50 minutes in class*

Date	Lecture Subject	Prof.
Sept. 5	Introduction to the course content and operational procedures. VDJ recombination	THW AM
Sept 10	VDJ recombination	AM
Sept.12	VDJ recombination	AM
Sept 17	Affinity Maturation and class switch	AM
Sept. 19	Affinity maturation and class switch	AM
Sept 24	Affinity maturation and class switch	AM
Sept. 26	Antibody structure	JPJ
Oct. 1	Antibody Functions and Applications	JPJ
Oct. 3	Assays used to measure MHC restriction/T cell recognition	THW
October 8	<b>TERM TEST 1: Held in class, during class time 50 minutes 32% of course</b>	JPJ AM
October 10	T cell recognition continued	THW
October 15	Antigen Processing MHC I and II	THW
October 17	Antigen Processing MHC II	THW
Oct 22	Antigen processing MHC I	THW

Oct 24	T cell activation and costimulation	THW
Oct 29	T cell costimulation continued	THW
Oct 31	Innate pattern recognition - TLRs	DP
Nov 4-9	<i>Reading Week no classes- a review session for TT2 will be scheduled this week</i>	
Nov. 12	<b>Term test 2, Watts material, in class 50 minutes, 32% of course</b>	TW
Nov. 14	Innate pattern recognition – cytosolic sensors	DP
Nov. 19	Innate pattern recognition – cytosolic sensors, inflammasomes	DP
Nov 21	Biology and function of innate lymphoid cells	AMo
Nov. 26	Biology and function of innate lymphoid cells	AMo
Nov. 28	Biology and function of innate lymphoid cells	AMo
Dec 3	ILC continued	AMo

**Reference Material:** Although there is no required text for this course, any recent edition of Janeway, Travers *et al.* Immunobiology text (e.g. 9<sup>th</sup> Edition), which most of you already have, will serve as a "first resource" for you. Instructors will be providing you with reference lists of key papers or reviews that they will be discussing. In fourth year courses we expect you to start reading some of the primary literature. Immunology is an experimental science and you will find that in this course it is not just facts and concepts that are being relayed, but also that the experimental foundations for these facts and concepts are stressed. Thus, you may have to consult the primary literature to clarify in your mind an experimental approach which was discussed in class but which you did not fully grasp because you were unfamiliar with it. **We highly recommend that you read the recommended papers and do the practice exam questions to become familiar with the kind of problems we ask on the exam.**

*Handouts of lecture power points will be made available to students through Quercus.*

**Review Sessions:** Although you are always free to seek out individual instructors for clarification of the lecture material, be it by phone, e-mail, or in person, for the past several years the classes have found it useful that we held some group review sessions at which TA and/or instructors were present to answer questions posed by the students. These are strictly optional and no new material is deliberately presented. A group review session will be held a few days before each term test- to be arranged by the TA for each section. A third session covering the remainder of the course will be held in December at a time mutually agreeable to the instructors and the majority of the class.

**Examinations:** There will be two term tests and one final exam. Exams are not cumulative, but it is possible that techniques covered in an early exam could come up again in another context.

**Term test 1:** will be worth **32%** of the final mark and will cover the first 8 lectures. It will be a 50-minute examination held during class time. The questions will be a combination of problems,

essays and short answers on the material covered by Dr. Julien (8% of course) and Dr. Martin's lectures (24%). **Term test 1 grade will be made available before the drop date.**

**Drop date:**

Undergraduates: Nov. 4, 2019

Graduate students: October 28, 2019

**Term test 2:** will be worth **32%** of the final mark and will cover Dr. Watts' 7 lectures.

Final exam will be held in the Faculty of Arts and Science Christmas examination period, **December 7-20, 2019**. This exam is worth **36%** of the final mark and 2hrs will be allowed. It is anticipated that the marks distribution for the final exam will be as follows: **Dr. Philpott 18% and Dr. Mortha 18%**

**Missed tests:** Students who miss an examination must provide an **original** of the *verification of student illness or injury form*\* signed by a qualified physician and stamped with their address and phone number, otherwise a mark of zero will be assigned for that examination.

\*[http://www.illnessverification.utoronto.ca/document/Verification%20of%20Student%20Illness%20\(VOI\)%20-%20March%207%202018%20-%20AODA.pdf](http://www.illnessverification.utoronto.ca/document/Verification%20of%20Student%20Illness%20(VOI)%20-%20March%207%202018%20-%20AODA.pdf)

If you need the form for more than one course, when you bring the original document to the Immunology undergraduate office they can verify the original and take a copy. The student must inform the course instructor and a (different) make-up exam will be arranged. **Only one make up exam will be allowed per test. As we only want to hold one make-up exam, it is imperative that you communicate with course coordinator if your illness does not allow for a make-up exam within a week or so of the original exam.** The make-up exams for term test 1 and 2 will be scheduled by the faculty member(s) in charge of that section, whereas the final exam deferred exam is organized by Faculty of Arts and Science normally held during reading week the following term.

**Final exam schedule (exam period is Dec 7-20):** Please do not finalize your end of term travel plans until the date of the December examination is known.

**Accessibility Needs:** The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: [disability.services@utoronto.ca](mailto:disability.services@utoronto.ca) or <http://studentlife.utoronto.ca/accessibility>."

## **Molecular Immunology for Graduate Students: IMM 1428H**

IMM1428 is available as a graduate course. Note: Students in the Immunology Ph.D. program cannot use IMM1428 as part of their graduate credit requirement.

**TERM PAPER FOR GRADUATE STUDENTS:** For students enrolled in IMM1428H there will be an additional component in evaluating your performance in this course. You will be required to write a term paper of 10-12 double spaced pages in length on any major topic in the course. You may not, however, choose a topic that is closely related to your own research area. You are free to discuss possible topics with any of the instructors and you must obtain approval from the course coordinator (Dr. Watts) for your essay topic in advance. We are looking for an essay that demonstrates your critical thinking/evaluation of a focused area related to any topic touched on in the course not in your immediate research area. This approval must be obtained

by **November 8, 2019**. For grading purposes, the essay will contribute 20% of the final aggregate mark, the balance being made up of the final exam and the two term tests. Please send by email as attachment by due date of **December 6, 2019**. *Students are required to hand in the academic integrity check-list with their essays* (see link below under academic integrity statement). Essay will be graded by the course coordinator with potential input from another faculty member with expertise in the area.

**Academic integrity statement:** “Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.” See

<http://www.artsci.utoronto.ca/osai/instructors/downloadable-templates/ai-statements-checklist> .

**Instructors:**

**TW: Tania H. Watts, Ph.D. course coordinator**

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**DP: Dana Philpott, Ph.D.**

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**TAs:**

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TA part II (Watts lectures) Leslie Yee Tung Leung Email: [leslieyt.leung@mail.utoronto.ca](mailto:leslieyt.leung@mail.utoronto.ca)

TA part III (Philpott, Mortha lectures): Mark Gower Email: [mark.gower@mail.utoronto.ca](mailto:mark.gower@mail.utoronto.ca)