MICB302 – Immunology (2020W)

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0 for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: http://academic.ubc.ca/support-resources/freedom-expression.

Calendar Description: Cells, molecules, and mechanisms of innate and adaptive immunity. Antigen presenting cells and the major histocompatibility complex, T and B lymphocytes and their antigen receptors, T and B cell development, innate and adaptive immune responses against pathogens, diseases associated with aberrant immune responses.

Lectures: Monday, Wednesday and Friday, 9 am – 9:50 am, via Zoom.

Instructor:

Dr. Tracy Kion, tkion@mail.ubc.ca, Office hours – TBA

Teaching assistants:

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Course objectives:

• To reinforce and build upon important concepts in immunology and cell biology developed in MICB202 and BIOL200.

• To gain an in-depth understanding of the cells and molecules of the immune system, the immune responses to infection by pathogens, and how the immune response can sometimes cause disease. Selected case studies will be used to provide examples of the concepts of the immune response in the infection and disease.

• Prerequisite for MICB402.
Prerequisites and assumed background for this course:

- **MICB202 (Introductory Medical Microbiology and Immunology)** We will assume that you are familiar with the major concepts in immunology that were discussed in MICB202. We will go over some of the key points, but please review your notes from this course.

- **BIOL200 or equivalent (Cell Biology)** We will assume that you are familiar with cellular organization and the functions of various organelles, the basic structures of DNA, proteins and membranes, and important cellular functions including transcription, mRNA splicing, translation, and protein secretion. Please look at relevant sections in the “Essential Cell Biology” or “Molecular Biology of the Cell” textbooks to refresh your memory.

**Course Reading Package**

The MICB302 Course Reading Package has been moved online to Canvas. Students can copy and paste the notes into their own documents and annotate them as appropriate.

All of the material in the MICB302 Reading Package is required reading and can be the subject of exam questions, even if not covered during the lecture periods.

**iClicker Cloud**

We will use iClickers in class to answer multiple-choice questions in many of the lectures, but they will not be used for any part of the course grade.

UBC has provided a subscription to iClicker Cloud for all students. iClicker Cloud will work similar to the iClicker system that you have used in the classrooms, but you’ll use your phone or tablet to answer questions. A student guide to iClicker Cloud can be found here [https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/](https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/) (this link is also on Canvas).

**MICB302 Canvas site:** Login at [https://canvas.ubc.ca](https://canvas.ubc.ca)

**The purpose of the website is to:**

- post figure sets, review questions, and other study aids.

- provide a forum for students to exchange views about the course and the course material (Discussion board).

- post news items and research items relating to current developments in immunology research.
The purpose of the lecture period is to:

- convey the important concepts that you will need to know for the exams using figures from the textbook as well as other figures to enhance your understanding of the material.
- point out areas of active research in immunology.

Learning objectives: By the end of the course, you should be able to:

1. Identify the major mechanisms (inflammatory responses, cytotoxic T cells, antibodies) by which immune cells protect us from different types of pathogens (viruses, extracellular bacteria, intravesicular bacteria, parasites) or from cancer cells.

2. Understand how immune cells detect the presence of pathogens and cancer cells (pattern recognition receptors, antigen receptors, antigen presentation pathways, NK cell receptors).

3. Describe processes that lead to the elimination of pathogens (e.g., opsonization, phagocytosis, neutralization, complement activation, cell-mediated cytotoxicity).

4. Describe the structure and function of key molecules that mediate immune responses including antibodies, antigen receptors, Toll-like receptors, MHC proteins, cytokines, chemokines.

5. Describe the main cell types of the immune system including their development, function, and for lymphocytes, how they generate antigen receptors.

6. Understand the processes that occur during T and B cell development that allow these cells to become tolerant to self-antigens and responsive to other antigens.

7. Describe the function of T and B lymphocytes in an immune response.

8. Describe all the innate and adaptive processes involved in an immune response to a pathogen (i.e., how immune cells perceive a pathogen, how they respond to it and how this usually results in clearance of the pathogen and a return to homeostasis).

9. To be able to predict what type of immune response you would need to combat a particular type of pathogen.

10. Describe how defects in immune cell regulation can lead to immunodeficiency diseases, autoimmune diseases and allergies.

11. Describe the basis for and application of current experimental approaches in immunology including, knockout and transgenic mice, CRISPR/Cas and Cre-lox gene editing.

12. Relate processes that occur in immune cells to similar processes that occur in all cell types and which have been described in previous cell biology courses (e.g., mRNA splicing, protein secretion, receptor signaling).
**Tutorials**: The tutorials will not run as formal tutorial sessions but as informal sessions or office hours for the TAs. During this time, you can ask your TAs questions about the course content or the review questions on the Canvas chapters. You can also ask them about research.

**Tutorials will start week 3 (week of Sept. 16th).**

**Grade Distribution:**

**Canvas assignments:**

Canvas assignments will consist of a combination:

1. Quizzes – consisting of multiple-choice questions (MCQs) and/or short answer questions (SAQ) and/or matching questions (MQs). Best 6 of 8 quiz grades are used for the calculation.

2. Case study assignments - a short story about a patient with a problem with their immune system. Students’ understanding of the problem will be assessed by SAQs and maybe some MCQs. Best 6 of 8 case study grades are used for the calculation.

Students are expected to work independently on these assignments.

**Exams:**

1. There will be one “take-home” midterm scheduled for October 28th

Details about the midterm exam will be released a week before the exam (i.e., the content that would be eligible for examination). The information will be sent by email using the University’s registration system and will be posted on Canvas. Therefore, it is important that your email address is recorded with the University.

Students are required independently to work on the take-home component of the exams (if this is part of the exam). Students that submit exams where the answers have been copied will be awarded a mark of zero for this portion of the exam.

2. The final exam will be held during the final exam period. The final exam will be comprehensive, but more emphasis will be placed on the content from the after the midterms cut-off date. The material in the latter part of the course builds on earlier material; thus, you will need to be familiar with the major concepts from the first half of the course.

The exam period is set for Monday Dec. 7th – Tuesday Dec. 22nd, 2019 inclusive.

**Missed Final Exams**: Students that are absent during the final exam must report to the Dean’s Office as soon as possible and request a form for a Deferred Exams. The Dean's office will require valid documentation to explain your absence from an exam. Deferred Exams are scheduled by the Enrolment Services and are usually held in late July/early August.
Note that instructors are not permitted to rearrange the times of final exams for students other than in a case of exam hardship. An exam hardship is defined as 3 exams within a 24-hour period. For example, Student “A” has an exam at 8:30 am, 12:00 noon and 7 pm; this is an exam hardship and the 2nd exam would be rescheduled (probably to the following day). An example of what is NOT an exam hardship: Student “B” has exams scheduled at 8 am, 12:00 noon, then 8 am the following day. The third exam is in the next 24-hour period.

Students will be permitted to access the Canvas course notes and their personal notes during both exams.

Clear and concise writing is better than a large volume. Responses that have the right answer, but with lots of incorrect or irrelevant information may receive lower scores than responses that are correct and concise.

Tip: Outline your response first as opposed to writing a “stream of consciousness” answer.

**Reach Out for Success:**

University students often encounter setbacks from time to time that can impact academic performance. Discuss your situation with your instructor or an academic advisor. Learn about how you can plan for success at: [www.students.ubc.ca](http://www.students.ubc.ca).

For help addressing mental or physical health concerns, including seeing a UBC counsellor or doctor, visit: [www.students.ubc.ca/livewelllearnwell](http://www.students.ubc.ca/livewelllearnwell).

For tips to address the transition to online learning, visit: [https://keeplearning.ubc.ca](https://keeplearning.ubc.ca).

**Supporting Learning with Academic Integrity (adapted from Dr. C. Rawn, Dept. of Psychology, UBC).**

In the academic community—a community of which you are now a part—we deal in ideas. That’s our currency, our way of advancing knowledge. By representing our own and others’ contributions in an honest way, we are (1) respecting the rules of this academic community, and (2) showcasing how our own novel ideas are distinct from but relate to their ideas. This gives us a formal way to indicate where our ideas end and where others’ begin.

But academic integrity goes well beyond formal citation. **Welcome to the academic community. You are expected to act honestly and ethically in all your academic activities, just like the rest of us.**

Make sure you understand UBC’s definitions of academic misconduct, consequences, and expectation that students must clarify how academic honesty applies for a given assignment. **Please ask if you’re not sure.** (While you’re checking out the calendar, you might want to check out the “Student Declaration and Responsibility” statement you agreed to when you registered.)

**What does academic integrity look like in MICB 202?**

*At any time: if you are unsure if a certain type of assistance is authorized, please ask. If you have a*
need that is unmet by existing course materials, course structure, and/or our learning community members, please ask.

DO your own work. All individual work that you submit should be completed by you and submitted by you. All assessments, large and small, are designed to help you learn and understand the concepts in the course and apply your knowledge to solve problems.

- It is unacceptable to buy/sell/swap/share assignment questions or answers on any platform.
- It is unacceptable to misrepresent your identity by using someone else to complete any portion of a course (e.g., comment on a discussion board, complete a quiz question).
- It is unacceptable to help someone else cheat.

AVOID collusion. Collusion is a form of academic integrity violation that involves working too closely together without authorization, such that the resulting submitted work gains unfair advantage over other students because is a measurement of the group/pair/others’ understanding rather than the individual understanding. For example, collusion on an open book assignment or test includes working together to write answers or answering someone else’s question in any forum. Assignments that are explicitly the product of group collaboration have authorization, so don’t count as collusion. Preparing to individually complete an assignment or test by studying together (e.g., discussing concepts, quizzes each other and giving feedback on each others’ answers) doesn’t count as collusion. In this course, your assignments and tests must be individually written.

Can I work with a classmate to co-create study notes? Yes, you can create your own original collaborative notes, but it is unacceptable to post them on file-sharing websites (e.g., CourseHero, GoogleDocs). I recommend using the features in Canvas groups to ensure your work remains protected. Send me a message using Canvas Inbox, and I’ll create a Group just for you. That will allow you to upload and share notes, and to work collaboratively on Pages (see this site for an introduction to these features). I also recommend starting your collaboration with a written agreement that addresses integrity issues, such as these: Who else can see/use/contribute to these notes? How will we ensure we are not violating copyright?

DO NOT share materials provided for you to use in this course. We are working hard to provide all the materials you need to succeed in this course. In return, please respect our work. All assignment instructions, quiz questions and answers, discussion questions, announcements, PowerPoint slides, audio/video recordings, Canvas modules, and any other materials provided to you by the Teaching Team are for use in this course by students currently enrolled in MICB 202 section 101.

- It is unacceptable to share any of these materials beyond our course, including by posting on file-sharing websites (e.g., CourseHero, GoogleDocs).
- It is unacceptable to copy and paste sentences from the textbook (e.g., definitions) into for-profit software (e.g., Quizlet) for use in studying. Respect the Teaching Team and textbook authors’ intellectual property, and follow copyright law.