



MICB 323 – MOLECULAR IMMUNOLOGY & VIROLOGY LABORATORY

1 COURSE AND INSTRUCTOR DETAILS

Lectures: The first lecture will be **Monday January 7, 2019.**

L01	Mondays	1-3pm	IRC 5
	*Fridays	2-3pm	IRC 5 (*Note - Friday lectures/workshops will occur periodically as needed.)

Lab Sections: Please attend the lab in which you are registered. Labs will begin the **week of January 7, 2019.**

L01	Tuesdays	1-5pm	Room 109/111 Wesbrook
L02	Wednesdays	1-5pm	Room 109/111 Wesbrook
L03	Thursdays	1-5pm	Room 109/111 Wesbrook

Teaching team:

Instructor	Teaching Assistants
<p>Dr. Marcia Graves marcia.graves@ubc.ca</p> <p>Office: Wesbrook, Room 131 Office Hours: By appointment</p>	<p>Virginie Jean-Baptiste Iwona Niemietz Miguel Mejias Cordero</p> <p>All communication with TA's will be done in Lab and on the discussion forums on Canvas.</p>

2 PRE-REQUISITES

MICB 322 (Molecular Microbiology Laboratory)

This course is restricted to students in one of these programs: BSc with one of these specializations:

- Honours MBIM, OR
- Major MBIM

Recommended - MICB 202 (Introductory Medical Microbiology and Immunology)

Students should be familiar with the major concepts in virology and immunology that were discussed in MICB 202. We will review some key concepts before exploring these topics in more detail, but please review your notes from this course.

3 COURSE MATERIALS

Course Website: URL www.canvas.ubc.ca MICB 323 Section 201 - 2018W; requires UBC CWL ID.

For Canvas help, contact the Help Desk: <https://students.canvas.ubc.ca/help/>

i>Clicker classroom response system: Available at UBC Bookstore. Reef polling is enabled for MICB 323.

You are expected to have the following items:

- A Knee-length laboratory coat
- A bound lab notebook (see guidelines on how to keep a lab notebook posted on Canvas)
- A waterproof, permanent marker (sharpie) appropriate for labeling materials in the lab

4 COURSE EVALUATION

%	Assessment (numbers in parentheses indicate proportional number of marks for each assignment)
5	<u>Professional behavior and lab citizenship</u> <ul style="list-style-type: none"> • includes lecture attendance and lab participation, arriving on time, being prepared, working effectively as a member of a group, timely notice of absences, timely effort to make up missed work, collegiality, following safe and clean best practices at the bench and being a good “lab citizen.”
7	<u>Weekly quizzes and activities during lecture</u> <ul style="list-style-type: none"> • the lowest quiz mark is dropped (no makeups for absences) • Activities in lecture 1 (Jan 8th) will not count towards your grade
8	<u>Lab notebook Assessment</u> (see guidelines on how to keep a proper lab notebook, posted on Canvas) <ul style="list-style-type: none"> • includes all procedures, results, conclusions, troubleshooting exercises and explanations to improve failed or incomplete experiments • includes all calculations for the solutions that are used in the labs • includes all pre-lab questions/work • handed in twice; 3 marks for first marking, 5 marks for the second marking
10	Individual Assignment for Project 1 – Annotated bibliography
5	Group Assignment for Project 1 – Formal figure and figure legend (handed in as a group, but also included in all student’s lab notebooks).
15	Group Assignment for Project 2 – Mini Manuscript
15	Group Assignment for Project 3 – Mini Manuscript
10	Group Assignment for Project 4 – FACS protocol and figure
25	Lab course final Exam – Written (20)/Practical (5)
100	

5 IMPORTANT DATES FOR MAJOR ASSESSMENTS (COULD BE SUBJECT TO CHANGE)

Friday Feb 8 - Lab notebooks are due. Hand in either at the end of your lab session the week of Feb 5-8, or leave in the box outside Dr. Graves office door by Friday.

Monday Feb 11 - Annotated Bibliography is due. Individual electronic submission on Canvas.

Friday March 15 - Project 2 Manuscript is due. Electronic submission on Canvas (one per group).

Monday April 1 - Project 3 Manuscript is due. Electronic submission on Canvas (one per group).

Monday April 8 - Project 4 assignment is due. Electronic submission on Canvas (one per group).

Final exam date TBA - Lab notebooks will be due on the Final exam day.

6 COURSE GOALS

In MICB 323, students will demonstrate learning by:

- following all safety rules, and anticipating and preparing for any potential risks.
- correctly using and applying the selected laboratory techniques and tools.
- being able to perform standard calculations typically used to make solutions and make up working concentrations of reagents.
- keeping complete lab notes so that colleagues can figure out what experiments were done, why they were done, and how they were done.
- conducting experiments and working as a team to accomplish lab work.
- explaining the theory behind the experimental techniques.
- processing and analyzing raw data, and presenting data in a meaningful form.
- reporting the direct inferences from data, coming up with possible interpretations of the data, and connecting these interpretations to the research of others.
- evaluating and interpreting data from published research articles.
- demonstrating scientific writing skills and presenting the work performed in research paper format.

7 LAB SCHEDULE AND PROJECT DESCRIPTIONS

	Lab 1 Jan 7-11	Lab 2 Jan 14-18	Lab 3 Jan 21-25	Lab 4 Jan 28- Feb 1	Lab 5 Feb 4-8	BREAK	Lab 6 Feb 25-Mar 1	Lab 7 Mar 4-8	Lab 8 Mar 11-15	Lab 9 Mar 18-22	Lab 10 Mar 25- 29	Lab 11 Apr 1-4
Project #1	Transform competent bacteria Introduction to Eukaryotic cell culture	Mini-prep: plasmid isolation <u>Trypsinize</u> adherent cells Cell counting and plating	Phase Microscopy Transfection of adherent cells NEXT DAY: (Outside of lab time) PMA stimulation and cell fixation	Nuclear labeling, prep coverslips for imaging Epi-fluorescence Microscopy imaging Data Acquisition		BREAK						
Project #2				Prep separating gel for SDS-PAGE	T cell stimulation Cell lysis and protein assay quantification	BREAK	Prep stacking gel Run SDS-PAGE Transfer <u>Ponceau</u> membrane staining	Western blotting: Primary and secondary abs <u>Chemi-luminescence</u> Development				
Project #3						BREAK		Time course LPS stimulation of murine macrophages (0, 3h samples) NEXT DAY: (Outside of lab time) Collect 24h sample	ELISA for TNF- α secretion from media <u>supernatants</u> from LPS stimulated murine macrophages (0, 3h, 24 hr)	RNA isolation from LPS stimulated murine macrophages (0, 3h, 24 hr) QPCR for TNF expression		
Project #4						BREAK					Splenic lymphocyte cell isolation and immuno-labeling	FACS data analysis

*Family day – Monday Feb 18th

Project #1:

To determine the morphological alterations to cell shape and the actin cytoskeleton in response to phorbol ester-dependent cell activation.

Project #2:

Activation of signaling pathways in T cells in response to TCR crosslinking.

Project #3:

LPS-dependent production of TNF-alpha in a murine macrophage cell-line.

Project #4:

FACS analysis of isolated and immunolabelled murine splenic lymphocytes.