

BIOL 515/MDSC 515
Cellular Mechanisms of Disease

Course Coordinator/Primary Instructor:

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Visiting Lecturers:

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Office Hours/Policy on Answering Student Emails

Office hours will be held in the hour immediately preceding each lecture (MW 14:30-15:30), either in person (in Dr. Mahé's office: Foothills Medical Clinic, McCaig Tower, 7th Floor, Room 7523) or by ZOOM. While these office hours are open to anyone, meetings (even during these time) should be prearranged. Dr. Mahé will endeavor to respond to emails within 24 hours of receipt. It is important to recognize, however, that Dr. Mahé is a practising physician; as such, occasional reply delays owing to clinical urgency may occur. Students are encouraged to cc Dr. Mahé's administrative assistant on all emails (see below).

Teaching Assistants:

Ms. Liz McGovern (administrative assistant to Dr. Mahé)
Elizabeth.mcgovern@albertapubliclabs.ca
Office: 403-944-1566

Course Time and Location:

The course is scheduled for MW 15:30 - 16:45 via Zoom

As required, lectures will be delivered either live, or through pre-recorded video, at the same time as the scheduled in-person lectures (*i.e.* synchronously). Dr. Mahé (and potentially the visiting speaker) will be available before and after the online presentation to field questions.

Prerequisite/Co-Requisite:

Biochemistry 341 or 393 and Biology 331 or Medical Science 351

Course Description:

The cellular and molecular mechanisms underlying basic human disease processes and how these can be influenced by lifestyle and environmental factors. The ways in which this knowledge can be used in the laboratory diagnosis of disease.

Overarching Theme

The course format consists of 25 didactic lectures provided by specialist physicians and clinical scientists, expert in the subject matter. The course is designed to cover the various mechanisms of disease and provide pathophysiological explanations for how diseases manifest, their environmental and genetic causes, the clinical consequences, and with some discussion about treatments if applicable. The course is designed to draw together numerous concepts in cell biology and physiology to help learners better understand the consequences of pathology in humans.

Global Objectives

To understand the basic general pathology of human diseases at organ, tissue, cell and molecular levels, with a focus on the cellular basis of disease.

Learning Objectives

By the end of this course, students will be able to understand the general principles of pathology of inflammation, neoplasia, immunology and related disorders, genetic disorders, infectious diseases, hematologic disorders and transplantation, gastrointestinal disease, cutaneous disorders, women's and men's health topics, neurological and musculoskeletal disorders, disorders of neonates, infancy and childhood, and others. The course opens with sessions relating to evidence and scientific discourse, as well as refresher topics related to basic cellular biology and metabolism.

Required Textbooks

None required

Recommended Textbooks/Readings

STRONGLY RECOMMENDED (available through the University of Calgary Bookstore):

Robbins And Cotran Pathologic Basis Of Disease 10E, Kumar, et al. Elsevier. ISBN: 9780323531139

Electronic versions (or comparable editions) of this textbook are available through the University of Calgary Library.

Recommended readings for course sections may be added to the lecture video files and will be posted as links on D2L. Students are encouraged to review the D2L content section to preview recommended readings BEFORE each lecture.

Students should be aware that many of the readings they will be assigned may be of an unfamiliar nature and style. Students should allot sufficient time to allow for several reads of the assigned material.

Learning Technology Requirements

Brightspace (by D2L) is located on the University of Calgary server and will be used extensively for communication with students. **It is the student's responsibility to ensure that they receive all posted communications and documents and that they receive emails sent by instructors or fellow students through D2L.** Only your @ucalgary.ca email address may be linked to D2L. Please ensure that you are regularly checking your @ucalgary.ca account.

In order to successfully engage in learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security and malware updates;
- A current and updated web browser;
- Webcam (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Broadband internet connection

Most current laptops will have a built-in webcam, speaker and microphone.

A laptop, desktop, tablet or mobile device is required for D2L access. If you need help accessing or using D2L, please visit the Desire2Learn resource page for students: <http://elearn.ucalgary.ca/d2l-student/>.

Evaluation

The University policy on grading and related matters is described in section F of the 2020-2021 Calendar.

In determining the overall grade in the course, the following weights will be used:

- **Weekly quizzes: 60% (5% for each of 12 quizzes)**
- **Writing Assignments:**
 - **Critical Appraisal Exercise: 10%**
 - **Scientific Study Proposal Exercise: 10%**
- **Registrar-scheduled final exam: 20%**

The final exam IS CUMULATIVE in scope and is entirely multiple-choice.

Weekly Quizzes:

The weekly quizzes will be held through the D2L quiz feature. D2L will allow students to take the quizzes at any point during quiz allotment timeframe, but once started, each student will have a limit of 1 hour to complete the quiz. Quizzes will contain 2 to 4 questions only.

Quiz questions are designed to be challenging and will consist of short answer questions. The general topic areas of the quizzes will relate to those speaker topics presented during the week, and quizzes are not meant to be cumulative. However, students may need to apply critical thinking skills and careful thought in generating their responses. This approach is not meant to be punitive, but rather to assess at how well students are able to apply knowledge obtained from the weekly speaker topics to potentially

challenging scenarios. Since each quiz is relatively low-stakes, students should see the quizzes as opportunities to further explore the topics of the week.

Writing Assignments:

Writing skills are important to academic study in all disciplines. In keeping with the University of Calgary's emphasis on the importance of academic writing in student assignments (section E.2 of 2020-21 Calendar), writing is emphasized, and the grading thereof in determining a student's mark in this course. The Bachelor of Health Sciences values excellence in writing. Competence in writing entails skills in crafting logical, clear, coherent, non-redundant sentences, paragraphs and broader arguments, as well as skills with the mechanics of writing (grammar, spelling, punctuation). The University of Calgary offers a number of instructional services through the Students' Success Centre's Writing Support Services (<http://www.ucalgary.ca/writingsupport/>) for students seeking feedback on assignments or seeking to improve their general writing skills. Students are **strongly encouraged** to take advantage of these programs.

General Guidelines FOR EACH ASSIGNMENT:

1. **Writing assignments must be submitted through the D2L dropbox. Assignments sent directly to the instructor/coordinator, admin assistant or any of the speakers will be ignored.**
2. Evaluation rubrics for each writing assignment will be posted to D2L in advance, along with any other materials required for the specific assignment.
3. Length must NOT EXCEED 2 pages single-spaced (no less than 1.0 spacing) at size no smaller than 11pt Times New Roman font with 0.5-inch margins. Bibliography/references, figures, charts and diagrams are optional and do not count against the page limits.
4. Sources/references: Primary sources such as journal articles are preferred, ideally those that are peer-reviewed. Secondary sources such as textbooks, review papers, internet sources, newspaper or magazines articles and others are less desirable. All sources must be properly cited according to the APA manual of style, as outlined by the Effective Writing Program at The U of C: <https://www.ucalgary.ca/student-services/student-success/writing-support>

Critical Appraisal Exercise:

This exercise aims to address students' abilities to critically appraise a piece of scientific literature. For this exercise, a series of several journal articles will be provided to students (through D2L). Students must select one of the articles provided, read and evaluate the contents of the article, and provide a structured assessment of the article's thesis, its manner of exposition and its validity. Students will be provided with example critical appraisal guides; these should serve as guides and NOT templates. An evaluation rubric will also be provided, although a specific structure to this assignment will not be enforced.

Scientific Study Proposal Exercise:

This exercise aims to address students' abilities to pose a scientifically valid and assessable question, to design an appropriate experimental protocol to address the question, and to demonstrate an understanding of what would be construed as appropriate evidence to answer the question. Given the content of the course, this exercise should be focused on clinically relevant questions. Students will be provided with examples of clinically relevant questions, as well as provided with a marking rubric.

Final Grade Scheme:

Course Percentage Range	Performance Description	Assigned Letter Grade
96-100	Outstanding performance	A+
90-95	Excellent performance	A
85-89	Approaching excellent performance	A-
80-84	Exceeding good performance	B+
75-79	Good performance	B
70-74	Approaching good performance	B-
65-69	Exceeding satisfactory performance	C+
60-64	Satisfactory performance	C
57-59	Approaching satisfactory performance	C-
54-56	Marginal pass	D+
50-53	Minimal pass	D
0-49	Did not meet course requirements	F

Missed Components of Term Work:

Late submission of assignments is strongly discouraged. Students will lose 5% of the assignment total value for every day of delay in submission (one day of delay will be considered to have passed one minute after the deadline for submission to D2L). Students who miss taking a quiz or who do not take the final exam will receive a mark of zero for that item.

Exceptions relating to course work requirements and standards outlined herein can only be made in rare circumstances, as for example through a prescribed student accommodation plan (see below). This plan must be adhered to and should be provided to the instructor (and home programme) in advance. Other exceptions may be made in accordance with the University Calendar and Policies (e.g. illness, religious conviction, or domestic affliction) that are received in writing. It is considered proper comportment that the instructor be notified in advance of any anticipated exceptions or delays.

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A laptop, desktop, tablet or mobile device is required for D2L access. If you need help accessing or using D2L, please visit the Desire2Learn resource page for students: <http://elearn.ucalgary.ca/d2l-student/>.

Course Evaluations and Student Feedback

Student feedback will be sought at the end of the course through the Universal Student Rating of Instruction (USRI) and a qualitative student evaluation. Students are welcome to discuss the process and content of the course at any time with the instructor. Students may also address any concerns they may have with Dr. Ebba Kurz, Associate Dean (Undergraduate Health and Science Education) in the Cumming School of Medicine (kurz@ucalgary.ca).

Guidelines for Zoom Sessions

Zoom is a video conferencing program that will allow us to meet at specific times for a 'live' video conference, so that we can have the opportunity to meet each other virtually and discuss relevant course topics as a learning community.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. **Zoom links and passwords are only intended for students registered in the course.** Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

The use of video conferencing programs relies on participants to act ethically, honestly and with integrity; and in accordance with the principles of fairness, good faith, and respect (as the Code of Conduct). When entering Zoom or other video conferencing sessions, you play a role in helping create an effective, safe and respectful learning environment. Please be mindful of how your behaviour in these sessions may affect others. **Participants are required to use names officially associated with their UCID** (legal or preferred names listed in the Student Centre) when engaging in these activities.

Instructors/moderators can remove those whose names do not appear on class rosters. Non-compliance may be investigated under relevant University of Calgary conduct policies. If participants have difficulties complying with this requirement, they should email the instructor of the class explaining why, so the instructor may consider whether to grant an exception, and on what terms. For more information on how to get the most out of your zoom sessions visit: <https://elearn.ucalgary.ca/guidelines-for-zoom/>.

If you are unable to attend a Zoom session, please contact your instructor to arrange an alternative activity (where available). Please be prepared, as best as you are able, to join class in a quiet space that will allow you to be fully present and engaged in Zoom sessions. Students will be advised by their instructor when they are expected to turn on their webcam (such as for group work, presentations, etc).

The instructor may record online Zoom class sessions for the purposes of supporting student learning in this class – such as making the recording available for review of the session or for students who miss a session. Students will be advised before the instructor initiates a recording of a Zoom session. These recordings will be used to support student learning only.

Conduct During Lectures

The classroom (whether in-person or virtual) should be respected as a safe place to share ideas without judgement - a community in which we can all learn from one another. Students are expected to frame their comments and questions to lecturers in respectful and appropriate language, always maintaining sensitivity towards the topic. Students, employees, and academic staff are also expected to demonstrate behaviour in class that promotes and maintains a positive and productive learning environment.

As members of the University community, students, employees and academic staff are expected to demonstrate conduct that is consistent with the University of Calgary Calendar, the Code of Conduct and Non-Academic Misconduct policy and procedures, which can be found at <https://www.ucalgary.ca/policies/forms/title>.

Students are expected to take notes during class and should not rely solely on material supplied by the instructors.

Use of Internet and Electronic Communication Devices in Class

The Bachelor of Health Sciences program aims to create a supportive and respectful learning environment for all students. The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. However, research studies have found that inappropriate/off-topic use of electronic devices negatively affects the learning of the user and others during class time.

Students are responsible for being aware of the University's Internet and email use policy, which can be found at <https://www.ucalgary.ca/policies/files/policies/electronic-communications-policy.pdf>.

Attendance

Attendance (whether in person or online) is required and is monitored, although an attendance portion of the final grade in the course does not apply.

Policies Governing the Course:

Copyright

All students are required to reach the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf>) and requirements of the Copyright Act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks, etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy <https://www.ucalgary.ca/pubs/calendar/current/k.html>.

Instructor Intellectual Property

Course materials created by instructors (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may **NOT** be reproduced, redistributed or copied without the explicit consent of the professor. **The posting of course materials to third party websites such as note-sharing sites without permission is prohibited.** Sharing of extracts of these course materials with other students enrolled in the course **at the same time** may be allowed under fair dealing.

Academic Accommodations

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at <https://ucalgary.ca/student-services/access/prospective-students/academic-accommodations>. Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (<https://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf>). Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their instructor.

SAS will process the request and issue letters of accommodations to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

Academic Misconduct

The University of Calgary is committed to the highest standards of academic integrity and honesty. The University of Calgary has created rules to govern all its members regarding the creation of knowledge and the demonstration of knowledge having been learned.

Academic Misconduct refers to student behaviour that compromises proper assessment of a student's academic activities and includes (but is not limited to): cheating, fabrication, falsification, plagiarism, unauthorized assistance, failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses, and failure to comply with exam regulations applied by the Registrar.

For information of the Student Academic Misconduct Policy and Procedures, please visit;

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Additional information is available on the Academic Integrity website at: <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

Recording of Lectures

Audio or video recording of lectures is **prohibited** except where explicit permission has been received from the instructor.

Other Important Information

Freedom of Information and Protection of Privacy Act

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Appeals

If there is a concern with the course, academic matter or a grade, first communicate with the instructor. If these concerns cannot be resolved, students can proceed with an academic appeal, as per Section I of the University Calendar. Students must follow the official reappraisal/appeal process and may contact the Student Ombuds' Office (<http://www.ucalgary.ca/ombuds>) for assistance with this and with any other academic concerns, including academic and non-academic misconduct. Students should be aware that concerns about graded term work may only be initiated **within 10 business days** of first being notified of the grade. <https://www.ucalgary.ca/pubs/calendar/current/i-2.html>

Resources for Support of Student Learning, Success, Safety and Wellness

Student Success Centre	http://www.ucalgary.ca/ssc/
Student Wellness Centre	http://www.ucalgary.ca/wellnesscentre/
Distress Centre	http://www.distresscentre.com/
Library Resources	http://library.ucalgary.ca

Sexual Violence Policy

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and

timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at <https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370 MacEwan Student Centre, <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy (<http://www.ucalgary.ca/mentalhealth/>).

Student Ombuds' Office

The Student Ombuds' Office supports and provides a safe, neutral space for students. For more information, please visit www.ucalgary.ca/ombuds/ or email ombuds@ucalgary.ca

BHSc Student Faculty Liaison Committee (SFLC)

The BHSc SFLC, with elected representatives from all majors, serves to raise issues of interest to BHSc students to the program administration, including items pertaining to curriculum, scheduling and events. A list of current representatives can be found on the BHSc website.

Student Union (SU) Information

The SU Vice-President Academic can be reached at (403) 220-3911 or suvpaca@ucalgary.ca; the SU representatives for the Cumming School of Medicine can be reached at medrep1@su.ucalgary.ca or medrep2@su.ucalgary.ca.

Student Success Centre

The Student Success Centre provides services and programs to ensure students can make the most of their time at the University of Calgary. Our advisors, learning support staff, and writing support staff assist students in enhancing their skills and achieving their academic goals. They provide tailored learning support and advising programs, as well as one-on-one services, free of charge to all undergraduate and graduate students. For more information visit: <https://www.ucalgary.ca/student-services/student-success>

Emergency Evacuation/Assembly Points

As part of the University of Calgary Emergency Evacuation plan, students, faculty, and staff should locate the closest Assembly Point in case of Fire Alarm. Safety signage is posted throughout the campus showing the locations and the possible route to these locations. All students, faculty, and staff are expected to promptly make their way to the nearest Assembly Point if the Fire Alarm is activated. No one is to return into campus facilities until an all clear is given to the warden in charge of the Assembly Area. For more information, see <https://www.ucalgary.ca/emergencyplan/building-evacuation/assembly-points>

Safewalk

Campus security will escort individuals, day or night, anywhere on campus (including McMahon Stadium, Health Sciences Centre, Student Family Housing, the Alberta Children's Hospital and the University LRT station). Call 403-220-5333 or visit <http://www.ucalgary.ca/security/safewalk>. Use any

campus phone, emergency phone or the yellow phone located at most parking lot pay booths. Please ensure your personal safety by taking advantage of this service.