



# MCB\*6310 Advanced Topics in Molecular and Cellular Biology

01

Fall 2022

Section(s): 01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - September 06, 2022

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## 1 Course Details

### 1.1 Calendar Description

This course will consider fundamental cellular processes from multiple perspectives: biochemistry, cell biology, microbiology, molecular biology and genetics, and plant biology. Topics will vary from semester to semester but a multi-disciplinary approach to advanced concepts and experimental strategies will be a common theme.

### 1.2 Course Description

**Description:**

The ability to respond to stress is a critical cellular function for both bacterial and eukaryotic cells. For example, cells must respond to stress caused by rapid environmental changes in temperature, pH, and nutrient and water availability, among others. Cells also respond to internal sources of stress such as the accumulation of potentially toxic metabolites, misfolded proteins or modified membranes. Stress responses can also be activated by interactions with competitors, or through the effects of drugs, antimicrobial compounds, and toxins.

In this graduate level course, we will examine cellular stress responses from both biochemical and physiological perspectives with a focus on the plant response to cold and dehydration, and gut microbiota and pathogens. For example, we will see how plants counter dehydration at the *in vitro* level through the expression of stress-response proteins. As a second example, we will explore how the microbiota and pathogens respond to xenobiotics, competition, and host-driven stress. Stress responses will be explored through scientific readings, student-led presentations, and grant writing/review.

**Recommended background:** The course is designed for students who have met the requirements for entry to the M.Sc. or Ph.D. programs of the Department of Molecular and Cellular Biology, having completed an honours (science) B.Sc. degree or the equivalent. It is expected that students have a good working knowledge of basic biochemistry, microbiology and cell biology.

### 1.3 Timetable

Classes are Mondays, 1:30 - 4:20 pm in SSC 3317.

### 1.4 Final Exam

There is no final exam for this course.

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## 2 Instructional Support

### 2.1 Instructional Support Team

<b>Instructor:</b>	Steffen Graether
<b>Email:</b>	graether@uoguelph.ca
<b>Office:</b>	SSC 2255
<b>Office Hours:</b>	By appointment over Microsoft Teams.

<b>Instructor:</b>	Matthew Sorbara
<b>Email:</b>	msorbara@uoguelph.ca
<b>Office:</b>	SSC 3255
<b>Office Hours:</b>	By Appointment

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## 3 Learning Resources

### 3.1 Recommended Resources

**CourseLink (Website)**

<https://courselink.uoguelph.ca>

Course material, news, announcements, and grades will be regularly posted to the MCB\*6310 CourseLink site. You are responsible for checking the site regularly.

## 3.2 Additional Resources

**Writing Resources (Other)**

<https://www.lib.uoguelph.ca/writing-studying/writing-resources-workshops>

The University of Guelph Library provides an array of writing resources and workshops. Participants are encouraged to consult these resources when preparing the grant review document for this class.

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# 4 Learning Outcomes

## 4.1 Course Learning Outcomes

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

1.
    - Understand the damage caused by stress to an organism or system, and how they respond to the stress
    - Provide examples of techniques and technologies used to study stress response
    - Identify similarities and differences in stress response across different organisms
    - Gain experience reading scientific literature and presenting them to an audience with diverse expertise
    - Gain practice with scientific writing and become familiar with the grant review process
    - Improve critical thinking skills through reading the scientific literature and group discussions
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# 5 Teaching and Learning Activities

## 5.1 Schedule of Activities

**Draft schedule - subject to change**

**September 12**

Dr. Steffen Graether

Review course outline and course expectations

Biochemical basis for plant stress response

Outline for how to give oral presentations

**September 19**

Dr. Matthew Sorbara

Stress responses of the microbiota and pathogens in the gut

Timeline for grant review panel

Outline of grant review assignments

**September 26 (Presentations in groups of 2 students, if necessary. The final schedule will depend on the final enrolment.)**

**First round of presentations - Biochemistry of stress response in plants**

Presentation 1.1 - Presenter: TBA; Title: TBD

Presentation 1.2 - Presenter: TBA; Title: TBD

Presentation 1.3 - Presenter: TBA; Title: TBD

**October 3**

Presentation 1.4 - Presenter: TBA; Title: TBD

Presentation 1.5 - Presenter: TBA; Title: TBD

Presentation 1.6 - Presenter: TBA; Title: TBD

**October 10 – Thanksgiving holiday (no class)**

**October 17**

Presentation 1.7 - Presenter: TBA; Title: TBD

Presentation 1.8 - Presenter: TBA; Title: TBD

Presentation 1.9 - Presenter: TBA; Title: TBD

**October 24**

Presentation 1.10 - Presenter: TBA; Title: TBD

Presentation 1.11 - Presenter: TBA; Title: TBD

Presentation 1.12 - Presenter: TBA; Title: TBD

**October 31 (Presentations in groups of 2 students, if necessary)**

**Second round - Microbial stress responses in the gut**

Presentation 2.1 - Presenter: TBA; Title: TBD

Presentation 2.2 - Presenter: TBA; Title: TBD

Presentation 2.3 - Presenter: TBA; Title: TBD

**November 7**

Presentation 2.4 - Presenter: TBA; Title: TBD

Presentation 2.5 - Presenter: TBA; Title: TBD

Presentation 2.6 - Presenter: TBA; Title: TBD

**November 14**

Presentation 2.7 - Presenter: TBA; Title: TBD

Presentation 2.8 - Presenter: TBA; Title: TBD

Presentation 2.9 - Presenter: TBA; Title: TBD

**November 21**

Presentation 2.10 - Presenter: TBA; Title: TBD

Presentation 2.11 - Presenter: TBA; Title: TBD

Presentation 2.12 - Presenter: TBA; Title: TBD

Grants distributed for review

**November 28**

Grant review panel I

**Friday, December 2**



Grant review panel II

Wrap-up

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## 6 Assessments

### 6.1 Marking Schemes & Distributions

#### Tentative

1. Presentation I (slides = 20%; speech = 20%; content - 30%; leading discussion = 30%): **25%**
2. Presentation II (slides = 20%; speech = 20%; content - 30%; leading discussion = 30%): **25%**
3. Grant writing and review (content = 15%; figures and formatting = 5%; grammar and scientific style = 5%; feedback during review = 10%): **35%**
4. Overall participation (2% available for each presentation week: 0.5 - 1% for attendance and 1-1.5% for pre-submission of 2-3 questions for the presented paper(s)): **15%**

### 6.2 Submitting Semester Assignment

**Due date: Friday, November 18**

The grant writing exercise will include a 4-page grant on a topic selected from any of the presentations/papers covered in class. The grant will be submitted and distributed for feedback from your peers. A double-blind peer review process will be used. Grading will be

based on content, formatting, grammar, incorporation of figures/tables, and quality of feedback.

Grants will be graded by each instructor and two peer reviewers. An average of the scores will account for 25% of the grant writing exercise grade. The remaining 10% will be based on the quality of feedback the student gives to other grants during the review process.

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## 7 Department of Molecular and Cellular Biology

### Statements

#### 7.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

#### 7.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

#### 7.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>

- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.selfregulationskills.ca/>

## 7.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar. (<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

## 7.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

# 8 University Statements

## 8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

## 8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals  
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration  
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions  
<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

### 8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses  
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes  
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses  
<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

### 8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

### 8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website  
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

## 8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

## 8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## 8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

## 8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

## **8.10 Illness**

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

## **8.11 Covid-19 Safety Protocols**

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campusess/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campusess/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

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