



# MCB\*4510 Research Project in Molecular and Cellular Biology

W22

Winter 2022

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 1.00

Version 1.00 - January 07, 2022

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## 1 Course Details

### 1.1 Calendar Description

This course involves independent research of a practical or theoretical nature on a specific topic in molecular and cellular biology. It is carried out under the supervision of an individual faculty member. Students should make arrangements with both a faculty advisor and the course coordinator at least one semester in advance of taking the course. The signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from, and submitted to, the course coordinator no later than the 2nd class day of the semester in which the student is registered for the course.

**Pre-Requisites:**

MCB\*4500. Normally, students must have completed 6 semesters in an appropriate program in the biological sciences. Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors.

**Restrictions:**

Students in programs offering project courses cannot enroll in MCB\*4510. Grade requirements may be waived in exceptional circumstances at the discretion of faculty advisor and course coordinator. Course coordinator consent required.

### 1.2 Timetable

The scheduling of your work in the research lab is based on discussion between you, your faculty advisor, and other lab members.

Please note the proposed course format, schedule or location for the Winter 2022 semester may change up to the first day of classes due to personnel, resource, and public health circumstances and if conditions cannot be met to ensure the safety of our students and

instructors. Continue to watch the Student Planning website as format information could be updated until the first day of classes.

### 1.3 Final Exam

There is no final exam for this course

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## 2 Instructional Support

### 2.1 Instructional Support Team

**Course Co-ordinator:** Dr. Enoka Wijekoon  
**Email:** ewijekoo@uoguelph.ca  
**Telephone:** +1-519-824-4120 x56095  
**Office:** SC1 3517

Your Faculty Advisor is the most important member of your Teaching team. Students should be sure that they know how to contact them for guidance and advice.

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## 3 Learning Resources

### 3.1 Required Resources

#### Courselink (Website)

<https://courselink.uoguelph.ca>

There is a Courselink site for this course. Information on the Courselink site include:

- Deadlines for all assignments in the Courselink Calendar
- Assignment outlines, grading rubrics with standards
- This course outline

#### Zoom (Software)

In case in-person meetings are not able to be held due to public health guidelines, we will be using Zoom (<https://zoom.us>) for meetings, sessions and presentations in this course.

### 3.2 Recommended Resources

#### High speed internet connection (Equipment)

Although high speed connection to the internet is not required, it is highly recommended so that a better online experience with the tools, videos, and other materials used in the course can be achieved.

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## 4 Learning Outcomes

The Research Project course 2 is an extension of the Research Project course 1 and the final undergraduate capstone course for students doing molecular bioscience research. The main qualities of the course are immersion in real, current research going on in a faculty advisor's laboratory, where students can apply their accumulated knowledge and experience to performing real research in a real laboratory setting.

### 4.1 Intended Learning Outcomes

If students work diligently, they will:

#### 1. Problem Solving and Critical Thinking

- Present and assess original research results they have generated through writing a scientific manuscript in the format used for submission to the journal *Cell* and making a scientific poster presentation of their research
- Evaluate the limits of and troubleshoot experimental approaches through hands on research

#### 2. Communication

- Write a scientific manuscript in the format used for submission to the journal *Cell*
- Deliver a poster presentation of their research to students and faculty

#### 3. Professional and Ethical Behaviour

- Work effectively independently and in the context of a team, taking responsibility for their own research
- Demonstrate good work ethic by setting goals and meeting deadlines
- Add to their career planning by determining if they are capable of graduate school through direct experience with genuine research

#### 4. Scientific Method

- Conduct and troubleshoot authentic experiments on a real research problem
- Record, analyze and interpret scientific data with relevant tools in a scientific manuscript and through a scientific poster presentation

#### 5. Breadth & Depth of Understanding in a Particular Discipline

- Demonstrate advanced, contemporary and relevant knowledge in the research area of their choice through written and oral communication

#### 6. Scientific Technology & Techniques in a Scientific Discipline

- Conduct and troubleshoot experiments using relevant techniques, using relevant technologies as reported through a scientific manuscript and poster presentation
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## 5 Teaching and Learning Activities

The primary activities of this course are the production of a scientific manuscript outlining your research, a poster presentation of the research to an audience of your peers, and activity in a research group under the supervision of a faculty advisor.

### 5.1 Responsibilities

**Students (see *Research Performance Rubric* for how you will be assessed for your research work):**

- Participate in real research in an area of your choice
- Initiate discussions with faculty advisor or others to solve problems
- Display independence in the lab
- Conduct research in the laboratory
- Prepare a scientific manuscript outlining the research
- Present a scientific poster to other students and faculty

**Faculty Advisor:**

- Provides direction to the project
- Provides safety training and a safe environment in which to work
- Provides resources for the project, including mentoring, supplies, and certifications
  - May assign a day-to-day mentor, but is ultimately responsible for supervision
- Assesses their student's scientific manuscript\*
- Assesses the scientific manuscript/s of one or more other MCB\*4510 student/s assigned by the course coordinator. The number of papers assigned to each

faculty advisor will depend on the number of MCB\*4510 students each person advises (1 other paper per each student they advise).

- **At least one of the graders of each paper will be a faculty member of MCB**
- Assesses poster presentations\*
- Assesses their student's semester research performance

**\* In the rare instance when a faculty supervisor is unable to grade course assignments, the faculty supervisor is responsible for finding another faculty member to grade in their place.**

#### **Course Coordinator:**

- Administers the course
- Organizes and communicates the structure of the course, including sign-up, course outlines, Courselink, and assessments
  - Provides access to the Courselink page to all students and their faculty supervisors
- Schedules assessment deadlines
- Organizes seminar schedule
- Assigns a second grader for each student's scientific manuscript
- Collects and reports course grades

**Resolving conflict: Working in teams can involve differences of opinions or personalities. If you experience a conflict with a member of your lab, bring this conflict to the attention of your faculty advisor for help. If you experience a conflict with your faculty advisor that you are not able to resolve on your own, contact the Chair of the Department of Molecular and Cellular Biology for advice and assistance.**

## **6 Assessments**

### **6.1 Methods of Assessment**

Students will find details of all Assessments on CourseLink.

<b>Form of Assessment</b>	<b>Weight of Assessment</b>	<b>Due Date (2022)</b>	<b>Graders</b>
1. Progress Report	Ungraded requirement	February 16	Faculty Advisor
2. Poster Presentation	30%	Dropbox-April 1 @ 4 pm  Presentations – April 4-8	2 Faculty members
3. Scientific Manuscript	30%	Mon, April 18 @ 4 PM	Faculty advisor + one other faculty member
4. Research Performance	40%		Faculty advisor

## 6.2 POSTER PRESENTATIONS – 30%

See *Poster Presentation* Rubric for details of the criteria assessed and standards.

**Dropbox: April 1 @ 4 pm**

**Modifications to your poster can be done after this due date. There will be no late penalties for modifying and re-uploading the poster after the initial submission.**

**PRESENTATION DATES: April 4-8, 2022, in-person;** exact schedule TBD.

Students in MCB\*4510 are required to create and present a scientific **poster** similar to those presented at scientific conferences. You must prepare a poster summarizing your work and answer questions from faculty, and peers. Two faculty members will evaluate your poster and your knowledge of your research area, experimental design, results and conclusions.

### 6.3 SCIENTIFIC MANUSCRIPT WRITING – 30%

See *Scientific Manuscript* Rubric for details of the criteria assessed and standards.

**SUBMISSION: submit a pdf and a word copy of your manuscript to the Courselink Dropbox by the due date**

**LATE PENALTIES: 10% + 10% / day up to 50%, including weekends. A grade of zero will be assigned after 5 days late.**

Requirement: You will write a manuscript that mimics the format and style of a **submission to the journal Cell**. Read and follow the requirements outlined for submissions to Cell and associated webpages. Things to note are the length limits for the Summary (150 words) and that the introduction “should be succinct, without subheadings...” The introduction of your report for 4510 will therefore be very different from your literature review for 4500, requiring careful thought about the essential points needed for the reader to understand the context for the results.

Given MCB\*4510 is a continuation of your work in MCB\*4500, some overlap between MCB\*4500 and 4510 reports will be acceptable in the methods section.

Manuscripts that do not conform to the required format will be returned for revision and resubmission. Late penalties will be applied if the resubmission is after the due date.

Write your manuscript with a word processor. Insert your high-quality figures at the end of the submission. Please note that each figure is presented on its own page. It is also strongly suggested that you make use of referencing software to insert citations and format your final manuscript. Mendeley is a powerful, free reference managing software that works across computer platforms and integrates with Word.

The final grade for the Scientific manuscript will include grades for clear, concise and grammatically correct writing. Proofreading your manuscript is essential for high quality writing. Therefore, plan your writing to have your first complete draft done a week to 5 days before the due date to provide time for others to proofread your work and allow you enough time to make the necessary changes.

**NOTE:** Technical breakdowns are not a valid reason for requesting an accommodation. Important documents and drafts of documents should ALWAYS be backed up.

### 6.4 LABORATORY PERFORMANCE – 40%

See *Research Performance* Rubric for details of the criteria assessed and standards.

Students should realize that it is important that the experiments and analyses are done logically and thoroughly, so that results can be meaningfully interpreted. A lack of positive results in their project will not lead to a lower grade, as long as what has been done has been

properly carried out. “Negative” results may be useful if they demonstrate that an initial hypothesis was wrong, or if it can be shown that the experimental procedures used were not appropriate.

## 6.5 Turnitin

In this course, we will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

A major benefit of using Turnitin is that students can educate and empower themselves in preventing academic misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced the outside sources and materials in your assignment.

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## 7 Course Statements

### 7.1 Grading

Indicate all course policies regarding in-semester tests and assignment submissions, including time and place for submission of assignments and explicit penalties for late submissions.

## 8 Department of Molecular and Cellular Biology Statements

### 8.1 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](#)

### 8.2 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>

### 8.3 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/>

### 8.4 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>)

### 8.5 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.

## 9 University Statements

### 9.1 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.

### 9.2 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>

### 9.3 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>

### 9.4 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.

## 9.5 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>

## 9.6 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>

## 9.7 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.

## 9.8 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>

## 9.9 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.

## 9.10 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).

## 9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

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