

**Physiology and Pharmacology**  
**Physiology 4520B: Stem Cells and Regenerative Medicine**

Course outline for Winter 2022



Although this academic year might be different, Western University is committed to a **thriving campus**. We encourage you to check out the [Digital Student Experience](#) website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>.

**1. Technical Requirements:**



Stable internet connection



Laptop or computer



Working microphone



Working webcam

**2. Important Dates:**



| Classes Resume | Reading Week   | Classes End | Study day(s) | Exam Period |
|----------------|----------------|-------------|--------------|-------------|
| January 10     | February 19–27 | April 8     | April 9      | April 10–30 |

\* March 14, 2022: Last day to drop a second-term half course or a second-term full course without penalty

**3. Contact Information**



| Course Coordinator | Contact Information |
|--------------------|---------------------|
| Dr. David Hess     | dhess@robarts.ca    |

| Instructor(s) or Teaching Assistant(s) | Contact Information  |
|--|--|
| Dr. Tyler Cooper                       | tcoope2@uwo.ca   |
| Dr. John Di Guglielmo                  | <a href="mailto:john.diguqlielmo@schulich.uwo.ca">john.diguqlielmo@schulich.uwo.ca</a> |
| Mr. Kaiyuan Wang                       | kwang562@uwo.ca  |
| Ms. Nazihah Rasiwalla                  | <a href="mailto:nrasiwal@uwo.ca">nrasiwal@uwo.ca</a>                                   |

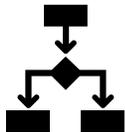
## 4. Course Description and Design

**Delivery Mode:** asynchronous recorded lectures + in-person review of central concepts (every 2<sup>nd</sup> week, up to 2 hours)

Central concepts in regenerative medicine are explored, with a focus on the preclinical development of stem cell therapies. Emphasized are: fundamentals of tissue-specific (post-natal) stem cell isolation, expansion and functional characterization using xenotransplantation into immunodeficient mouse models and transgenic mouse models for the treatment of human hematopoietic disorders, ischemic vascular diseases, diabetes, and diseases of the gastrointestinal system and skin. The role of stem cells in the development of cancer will also be discussed.

### Timetabled Sessions

| Component | Date(s) | Time           |
|-----------|---------|----------------|
| Lecture   | Tuesday | 2:30 – 4:30 pm |



- Asynchronous pre-work must be completed prior to sessions
- Attendance at sessions is required
- Missed work should be completed within 24 hours
- A recording will be provided of the sessions

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

### Course delivery with respect to the COVID-19 pandemic

Although the intent is for this course to be delivered in-person, the changing COVID-19 landscape may necessitate some or all of the course to be delivered online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any assessments affected will be conducted online as determined by the course instructor.

When deemed necessary, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: <https://remoteproctoring.uwo.ca>.

## 5. Learning Outcomes



Upon successful completion of this course, students will be able to:

- Understand fundamental concepts in stem cell biology and current laboratory techniques employed to study stem cell functions *in vitro* and *in vivo*.
- Discuss the promise and controversy over the use of different stem cell types and their potential for treating human disease.
- Understand the challenges surrounding the use of stem cell transplantation in the treatment of hematopoietic disorders, ischemic vascular disease, diabetes, and cancer.
- Understand the development of rational cell-based therapies from basic science, through clinical trials, to standard of care.
- Critically evaluate novel and emerging regenerative therapies for human disease.

## 6. Course Content and Schedule



| Week | Dates        | Topic   | Instructor       |
|------|--------------|---|------------------|
| 1    | Jan 10–14    | Fundamental concepts in stem cell biology: A historical perspective     | David Hess       |
| 2    | Jan 17–21    | Hematopoietic stem cell biology and hematopoiesis                       | David Hess       |
| 3    | Jan 24–28    | Development of transplantation strategies for hematopoietic diseases    | David Hess       |
| 4    | Jan 31–Feb 4 | Circulating progenitor cells that mediate blood vessel regeneration     | David Hess       |
| 5    | Feb 7–11     | Development of transplantation strategies for ischemic diseases         | David Hess       |
| 6    | Feb 14–18    | <b>In-class Mid-term Exam (35%)</b>                                     | David Hess       |
| 7    | Feb 21–25    | Reading Week  | David Hess       |
| 8    | Feb 28–Mar 4 | Roles of multipotent stromal cells in tissue repair and regeneration    | N/A              |
| 9    | Mar 7–11     | Strategies for diabetes therapy: Islet replacement versus regeneration  | David Hess       |
| 10   | Mar 14–18    | Stem cells of the GI system: Generation of intestinal organoids         | Tyler Cooper     |
| 11   | Mar 21–25    | Clinical applications for GI stem cells: From cystic fibrosis to cancer | Tyler Cooper     |
| 12   | Mar 28–Apr 1 | Multipotent skin progenitor cells in wound healing                      | John Diguglielmo |
| 13   | Apr 4–Apr 8  | Understanding the cancer stem cell hypothesis                           | John Diguglielmo |

## 7. Participation and Engagement



- Students are expected to participate and engage with content as much as possible
- Students can participate during in-class sessions or post comments on Owl after lecture
- Students can also participate by interacting in the forums with their peers and instructors

## 8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

| Assessment                         | Format  | Weighting   | Due Date  |
|------------------------------------|---|---|---|
| Blog assignment / discussion forum | Written expert comment (200-300 words) on assigned blog topic   | <b>Total = 15%</b><br><br>Expert Comment: accuracy (3%), insightfulness (3%), responses (3%)<br><br>General discussion / participation (6%) | You are the expert for 1 out of 5 blog topics and a participant in the discussion on 3 additional blogs. Each blog runs concurrent with a 2-week module in the course |
| Midterm Exam                       | Written short- and long-answer questions (2 hour in-class exam) | <b>Total = 35%</b><br><br>Short Answer: 4 questions worth 5 marks each<br><br>Long Answer: Choose 1 of 2 questions worth 15 marks each      | February 15, 2022   |
| Final Exam                         | Written short- and long-answer questions (3 hour exam)          | <b>Total = 50%</b><br><br>Short Answer: 4 questions worth 5 marks each<br><br>Long Answer: Choose 2 of 4 questions worth 15 marks each      | TBD - See posted final exam schedule  |



- All assignments are due at 11:55 pm EST unless otherwise specified
- Written assignments will be submitted to Turnitin (statement in policies below)
- Students will have 1 submission to Turnitin
- Rubrics will be used to evaluate assessments and will be posted with the instructions
- After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

|    |          |   |
|----|----------|---|
| A+ | 90-100   | One could scarcely expect better from a student at this level   |
| A  | 80-89    | Superior work which is clearly above average                    |
| B  | 70-79    | Good work, meeting all requirements, and eminently satisfactory |
| C  | 60-69    | Competent work, meeting requirements                            |
| D  | 50-59    | Fair work, minimally acceptable                                 |
| F  | below 50 | Fail  |

### Information about late or missed evaluations:

- Late assessments without self-reported absences or accommodation will be subject to a late penalty 20%/day
- Late assessments with self-reported absences or accommodation should be submitted within 24 hours of the end of the self-report or accommodation (e.g., due Fri 11:55 pm; self-report covers Fri/Sat; new deadline is Sun by 11:55 pm OR 24 hours after the end of the accommodation period)
- One make-up test will be offered for the mid-term exam [February 15, 2022] OR if the mid-term is not written with accommodation the weight of the mid-term will be transferred to the final exam
- All course components (e.g., blog assignment, mid-term exam, final exam etc.) must be completed to pass the course. Students will receive INC if these elements are missed without accommodation
- If a make-up assessment is missed without documentation, the student will receive an INC and will complete the task the next time the course is offered

### 9. Communication:



- Students should check the OWL site every 24 – 48 hours
- Students should email their instructor(s) and teaching assistant(s) using [email, OWL etc.]
- Emails will be monitored daily; students will receive a response in 24 – 48 hours
- This course will use the Owl forum for discussions
- Students should post all course-related queries on the discussion forum so that everyone can access the questions and responses

### 10. Office Hours:



- Office hours will be held in-person at a time set by the instructor and student (Please email the instructor or TA to make an appointment).
- Office hours will be held at the students request (Please email the instructor or TA to make an appointment).

### 11. Resources



- All resources will be posted in OWL

### 12. Professionalism & Privacy:



Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:

- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed
- Students will be expected to take an academic integrity pledge before some assessments

### 13. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.



1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Follow weekly checklists created on OWL or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Treat this course as you would a face-to-face course. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

### 14. Western Academic Policies and Statements

#### Absence from Course Commitments

##### [Policy on Academic Consideration for Student Absences](#)

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a **self-reported absence** or via the **Academic Counselling** unit. Students have two self-reports to use throughout the academic year; absence from course commitments including tests, quizzes, presentations, labs, and assignments that are worth 30% or less can be self-reported. Self-reported absences cover a student for 48 hours (yesterday + today or today + tomorrow). Your instructor will receive notification of your consideration; however, you should contact your instructor immediately regarding your absence. Students are expected to submit missed work within 24 hours of the end of the 48-hour period. Please review details of the [university's policy on academic consideration for student absences](#).

If you have used both their self-reported absences or will miss more than 48 hours of course requirements, a Student Medical Certificate (SMC) should be signed by a licensed medical or mental health practitioner and you should contact academic counselling. Academic Counselling will be operating virtually this year and can be contacted at [scibmsac@uwo.ca](mailto:scibmsac@uwo.ca).

#### Accommodation for Religious Holidays

The policy on Accommodation for Religious Holidays can be viewed [here](#).

#### Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has

implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

### **Academic Offenses**

“Scholastic offences are taken seriously, and students are directed [here](#) to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

### **Accessibility Statement**

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review [The policy on Accommodation for Students with Disabilities](#).

### **Correspondence Statement**

The centrally administered **e-mail account** provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

### **Discovery Credit Statement**

Students are permitted to designate up to 1.0 Discovery Credit course (or equivalent) for pass/fail grading that can be counted toward the overall course credits required for their degree program. The details of this policy and the deadlines can be found [here](#).

### **Turnitin and other similarity review software**

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and [Turnitin.com](#).

## **15. BMSUE Academic Policies and Statements**

### **Cell Phone and Electronic Device Policy (for in-person tests and exams)**

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices **MUST** be left either at home or with the student’s bag/jacket at the front of the room and **MUST NOT** be at the test/exam desk or in the individual’s pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

### **Copyright and Audio/Video Recording Statement**

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

## **Rounding of Marks Statement**

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

## **16. Support Services**

The following links provide information about support services at Western University.

[Academic Counselling \(Science and Basic Medical Sciences\)](#)

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)