1. Course Information

**Physiology 4730B - Cell Signaling in Tissue Injury & Repair**  
2017-2018 Winter Term

Cellular and molecular physiology is an exciting and rapidly changing area of biology. Physiology 4730B is a one-term half-course designed to introduce students to advanced concepts in selected areas of current research.

The objective of the course is to examine the basic principles and survey molecular mechanisms in regulation of cellular function that are integrated to support survival, repair and regeneration. Changes to the intracellular and extracellular environments of the cell will be examined to illustrate physiological responses to stimuli.

The models studied will be the skin and the nervous system and associated signal transduction pathways and relevant diseases. Reference to published scientific literature will be used as appropriate. The format of the course will be a series of lectures on the selected topics introduced by two faculty members. The oral critique will be led by individual (or small groups) students, but all students should have read the papers and are expected to participate in the critique. Students are also expected to be able to recall and critically evaluate facts, recognize general concepts, use new information to solve problems, be aware of the historical development of the research field, and be familiar with current literature and research methods. Oral and written skills will be also emphasized.

**Lectures:**  
Wednesday/1:30 – 3:30 pm  
Talbot College Room 342

**Requisites:**  
Prerequisite(s): Physiology 3120

Corequisite(s): N/A  
Antirequisite(s): N/A

**Senate regulation regarding the student’s responsibility regarding requisites:**  
Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

*Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also*
wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

2. Instructor Information

Dr. Sean Cregan  scregan@robarts.ca  RRI 3244  519-931-5777 x24134
[Course Manager]

Dr. Andrew Leask  Andrew.Leask@Schulich.uwo.ca  DSB 0067  519-661-2111 x81102

OWL:
Students with OWL issues should see: https://owl.uwo.ca/portal/site/owldocs

3. Course Syllabus

The objective of the course is to examine the basic principles and survey molecular mechanisms in regulation of cellular function that are integrated to support survival and tissue repair. Changes to the intracellular and extracellular environments of the cell will be examined to illustrate physiological responses to stimuli. The models studied will be the skin and the nervous system and associated signal transduction pathways and relevant diseases. Current concepts in inflammation, fibrosis and wound healing will be taught with an emphasis on clinical applications.

Learning Outcomes:

By the end of the semester, the successful student will be able to:

1. Define key concepts in neuronal injury and apply these to critically analyze neuroprotective strategies.

2. Utilize concepts in neural stem cell specification to design strategies to enhance neuronal repair/regeneration.

3. Critically evaluate the literature and understand what experimental procedures one would use to assess whether a pathway is essential for fibrosis.

4. Critically evaluate the fibrosis and wound healing field and suggest why basic research observations have not been successfully translated to the clinic.
### COURSE TOPICS & SCHEDULE:

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecturer</th>
<th>Topic</th>
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<tbody>
<tr>
<td>January 10</td>
<td>Cregan</td>
<td>Lecture #1: Mechanisms of neuronal injury and disease</td>
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<tr>
<td>January 17</td>
<td>Cregan</td>
<td>Lecture #2: Neuroinflammation/ Mechanisms of cell death I</td>
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<td>January 24</td>
<td>Cregan</td>
<td>Quiz #1</td>
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<td>Lecture #3: Mechanisms of cell death II</td>
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<td>January 31</td>
<td>Cregan</td>
<td>Lecture #4: Stem cells in neuronal repair &amp; Regeneration</td>
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<td>February 7</td>
<td>Leask</td>
<td>Lecture #1: Wound healing &amp; fibrosis</td>
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<td>February 14</td>
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<td>Midterm Exam (in class)</td>
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<td>February 19-23</td>
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<td>Reading week – Class cancelled</td>
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<tr>
<td>February 28</td>
<td>Leask</td>
<td>Lecture #2: Myofibroblast origin</td>
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<tr>
<td>March 7</td>
<td>Leask</td>
<td>Quiz #2</td>
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<td>Lecture #3: Growth factors in wound healing and fibrosis</td>
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<tr>
<td>March 14</td>
<td>Leask</td>
<td>Lecture #4: Microenvironment in wound healing and fibrosis</td>
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<td>March 21</td>
<td>Cregan/Leask</td>
<td>Student Presentations &amp; Quiz #1</td>
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<tr>
<td>March 28</td>
<td>Cregan/Leask</td>
<td>Student Presentations &amp; Quiz #2</td>
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<tr>
<td>April 4</td>
<td>Cregan/Leask</td>
<td>Student Presentations &amp; Quiz #3</td>
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<tr>
<td>April 11</td>
<td>Cregan/Leask</td>
<td>Student Presentations &amp; Quiz #4</td>
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<tr>
<td>April 14-30</td>
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<td>Final Exam – date TBD</td>
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4. Course Materials
Textbook: N/A
Supplemental Information: Review literature to be assigned
Laboratory Manual: N/A

5. Evaluation:

<table>
<thead>
<tr>
<th>Evaluation Item</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Lecture Quiz (2)</td>
<td>10%</td>
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<tr>
<td>Midterm Test (2h)</td>
<td>30%</td>
</tr>
<tr>
<td>Student Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Presentation Quiz (best 2 of 4)</td>
<td>10%</td>
</tr>
<tr>
<td>Final Examination (2h)</td>
<td>30%</td>
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Lecture Quizzes will be held in class at the beginning of the 3rd lecture given by Dr. Cregan (January 24) and Dr. Leask (March 7) and will cover lecture material presented in previous two lectures given by the corresponding instructor. The quizzes will be short answer style and students will be given 15 minutes to complete the quiz. Each quiz will be worth 5% of final grade (10% total).

Midterm Test and Final Examination will include one essay and short answer questions. The midterm exam will cover lecture materials and review paper assignments by Dr. Cregan only. The midterm exam will be 2 hours in length and will be held during class on February 14th, 2018. The final examination will be 2 hours and will cover lecture material and review paper assignments by Dr. Leask only. The exam will be held during the final exam period – time and room to be determined. Each exam is worth 30% of final grade.

Student Presentation: Students will be assigned papers in groups of two (or three if necessary). The student group will prepare a power point presentation in which they provide necessary background and summarize the key research methods and findings of the paper. They will also discuss the implications of the research findings and provide a critique of the study. Papers to be used for student presentation will be posted on WebCT two weeks prior to presentation date. Presentations will be 15 minutes in duration, and discussion of the content of each paper by fellow students and instructors will last for 5 minutes following each presentation. This time limit will be strictly enforced. All students should have read the papers and are expected to participate in the discussion. The mark for the oral presentation is worth 20% of final grade.

Presentation Quizzes: Students are expected to have read all student presentation paper assignments. There will be a multiple-choice quiz at the beginning of each presentation session related to the papers assigned for that session (1 question per presentation/paper for a total of 5 questions). Each presentation quiz will count for 5% of the final course grade. The best 2 out of 4 presentation quiz scores will count towards the final grade (10% total).
Note: it is the policy of the Department of Physiology and Pharmacology and the BMSc program in the Schulich School of Medicine and Dentistry to report the grade you earned in the course. Grades will not be “bumped”. For example, if your final grade is 78.45%, it will be entered as 79% and will not be “bumped” to 80%.

6. Additional Information/Statements

**Statement on Use of Electronic Devices**
Personal computers and communication devices (e.g. cell phones) will not be permitted to be used during quizzes, tests and examinations.

**Statement on Academic Offences**
“Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf.”

7. Absence from course commitments

**A. Absence for medical illness:**
Information about “Accommodation for Medical Illness – Undergraduates: POLICY ON ACCOMMODATION FOR MEDICAL ILLNESS - UNDERGRADUATE STUDENTS” can be found in the Academic Handbook at http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf Students must familiarize themselves with the Policy on Accommodation for Medical Illness: https://studentservices.uwo.ca/secure/index.cfm

**Statement from the Dean’s Office, Faculty of Science**
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: http://www.uwo.ca/univsec/handbook/appeals/medical.pdf
A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: https://studentservices.uwo.ca/secure/medical_document.pdf
The Policy on Accommodation for Medical Illness is also available on the BMSUE secure site: www.uwo.ca/bmsc
B. Absence for non-medical reasons:
Non-medical absences from assignments, quizzes or mid-term exams will be dealt with on a situational basis. If documentation is required, such documentation must be submitted by the student directly to the appropriate Faculty Dean’s Office and not to the instructor. It will subsequently be the Dean’s Office that will determine if accommodation is warranted.

C. 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.
A Special Examination must be written at the University or an Affiliated University College no later than 30 days after the end of the examination period involved. To accommodate unusual circumstances, a date later than this may be arranged at the time permission is first given by the Dean of the Faculty. The Dean will consult with the instructor and Department Chair and, if a later date is arranged, will communicate this to Registrarial Services. If a student fails to write a scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered.

Support Services:
Registrarial Services: http://www3.registrar.uwo.ca/index.cfm
Academic Counselling (Science and Basic Medical Sciences): http://www.uwo.ca/sci/counselling/index.html
Student Development Services: http://www.sds.uwo.ca
Student Health Services: http://www.shs.uwo.ca/