Department of Physiology & Pathophysiology

Neuroscience Graduate Course Offerings

IMED 7104: Neural Stem Cells: Biology and Regenerative Medicine Applications

1.5 credit hour course (Winter term, March-April, 2025)

Wednesdays 9:15am-noon

'in person' delivery on RFHS campus

Registration is open to all **graduate students** enrolled in any Faculty/College/Department interested in Neuroscience from the Fort Garry or RFHS Campuses, and the St. Boniface Research Centre.

General Course Description

This course will discuss current concepts in Neural Stem Cells biology in the central nervous system including their development, fate specification and maintenance. Additionally, a major component of this course will discuss the therapeutic potential of these stem cells through cell transplantation as well as gene and drug delivery for treating a variety of neurological disorders including brain and spinal cord injuries, stroke, multiple sclerosis, neurodevelopmental and neurodegenerative disorders. Neural stem cells play critical roles in the nervous system. The course is of high educational value for neuroscience-focused students in all the basic sciences and clinical departments and programs at the Fort Garry or RFHS Campuses, and the St. Boniface Research Centre with relevant research focus. Course material will be presented through the use of lectures, the use of student presentations, targeted examination of scientific literature, or the use of a combination of these approaches. For student presentations, the topics and bibliography to be covered will be guided by the instructor(s) and will depend on the specific research area of the student, as well
academic background.

Course Schedule:

Date	Lecture Title	Instructor
March 5, 2025 9:15 am-12:00pm	Introduction to neural stem cell development and differentiation	Dr. Lindsey
	Neural stem cell plasticity and epigenetic/genetic regulation	
March 12, 2025 9:15am-12:00pm	Role of microenvironment in regulation of neural stem cell properties in the mammalian brain and spinal cord	Dr. Karimi
	Regenerative properties of endogenous neural stem cells in the mammalian CNS in homeostasis and injury	
March 19, 2025 9:15am-12:00pm	Regenerative properties of adult neural stem cells in non-mammalian vertebrates	Dr. Lindsey
	Neural stem cells protocols and technologies	Dr. Eftekharpour
March 26, 2025 9:15am-12:00pm	Development of neural stem cell-based therapies for brain and spinal cord repair	Dr. Karimi
	Sources of neural stem cells for clinical applications (e.g. embryonic and fetal derived NPCs, cell programming and iPS technology)	
April 2, 2025 9:15am-12:00pm	Neural stem cells for gene and drug delivery to the central nervous system	Dr. Eftekharpour
	Current status of neural stem cells trials for neurotrauma and neurodegenerative disorders	
April 9, 2025 9:15am-12:00pm	Course Assignment: Interactive student presentations/discussions	Drs. Eftekharpour, Karimi, Lindsey
April 16, 2025 1:00-3:00 pm	Course Exam (BMSB- TBD)	Dr. Karimi

For more information contact:
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