



RESEARCH SCHOLAR PROGRAM – 2018

SUPERVISOR & PROJECT INFORMATION FORM

Please complete and return, via email only (crems.programs@utoronto.ca) by **November 3rd 2017** (*forms received after this date will not be posted*).

Supervisor Information

Name: Michael G. Fehlings

Email: michael.fehlings@uhn.ca

Degree: MD, PhD, FRCSC, FACS, FCAHS, FRSC

SGS Appointment (IMS, IHPME, LMP etc.): IMS

Academic Rank: Professor

Field of Research: Preclinical basic science research
in central nervous system repair and regeneration

Research Institution Affiliation (if applicable): Krembil Research Institute, Toronto Western Hospital, University Health Network

Allocation of student contact time (number of hours per week YOU are available to the student for any concerns or to review progress): 1hr

Project Information

Title: Stem cell mediated repair and regeneration of the injured spinal cord

Description (max 500 words):

Spinal cord injury (SCI) is a devastating condition currently without a cure. Over half of all traumatic SCI occurs at the cervical level (C1 to C7-T1). Patients with cervical injuries suffer the most devastating neurological impairments, have the highest mortality rates, and are burdened with increased health care costs. One of the main hurdles in regenerative therapy for SCI is the very low intrinsic ability of the nervous system to repair itself. The promise of neural stem cell transplantation lies in its ability to replace neurons and glia lost due to traumatic injury. We have previously established that the transplantation of stem cells represents a promising therapeutic strategy for cSCI. Building on this finding we have established human derived induced pluripotent stem cell neural progenitor cells (hiPSC-NPCs) for the treatment of SCI. However, there remain critical shortfalls in this technology that limit the efficacious application to human cervical SCI. These limitations include: **a)** the lack of NPCs displaying a regional identity; **b)** the poor survival of NPCs post-transplantation, and **c)** the inhibitory micro-environment of the injured spinal cord. Building on our previous work we propose to generate stem cells expressing a regional identity and engineered to modify the injury micro-environment thus promoting survival, integration and repair / regeneration of the injured spinal cord

If human subjects are involved, have Ethics been obtained?

YES

NO

Application Submitted

N/A

Do you expect this work will be published within the 20 months?

YES

NO

Uncertain

Student's roles and responsibilities (please be specific)

The student will perform several techniques including, but not limited to, PCR, cloning, immunohistology, imaging and behavioral analysis. The student will report to a senior scientific associated within the lab and a PhD student who is also a 4th year neurosurgery resident.