

An opportunity for international PhD study at the SCRC and the Nencki Institute (Warsaw, Poland) is available supported by the program:

Bio4Med: International PhD Program in Biological Bases of Human Diseases.

This program is a collaborative PhD program between the Nencki Institute of Experimental Biology, Warsaw, Poland, and international partners. Actually there are 22 positions available (<http://studia.nencki.gov.pl/?a=bio4med>). One of them is a collaborative research project involving Urszula Slawinska of the Nencki Institute and Larry M. Jordan at the SCRC, Winnipeg, Canada.

This project is entitled: *Studies on afferents crucial for locomotor recovery after spinal cord injury*

In our project we want to clarify the brainstem structures involved in production of locomotion from the MLR, and the interaction of this descending system with intraspinal locomotor neurons and peripheral afferents. The neural system crucial for locomotor recovery after spinal cord injury is under the control of a serotonergic descending pathway, an intraspinal cholinergic propriospinal system, and input from peripheral afferents. Cutaneous afferents from the plantar surface of the paw of cats and rats are necessary for locomotion after spinal cord injury. The intraspinal cholinergic propriospinal system has the capacity to drastically reduce cutaneous input from the limb, thus interfering with locomotor recovery. The balance between these factors determines the success of recovery after injury. Understanding the detailed physiology of these systems is the major goal of this research program.

Aims:

- Explanation of role(s) of the various serotonergic nuclei in the production of locomotion using novel methods (pharmacogenetic and optogenetic) to activate and inactivate the MLR and its brainstem targets
- Determination of combined effects of brainstem locomotor neurons and cutaneous and proprioceptive afferents using denervation and electrical stimulation approaches.
- Morphological verification of the afferent fiber terminations in the spinal cord (anterograde tracing, immunohistochemistry, and electrophysiological recordings of field potentials).
- Determine the distribution of serotonergic and cholinergic receptors on the terminals of these afferents and their target cells (intracellular anterograde filling and immunohistochemistry).

Methodology:

- Behavioral and chronic electrophysiological methods routinely in use in the Slawinska lab.
- Acute electrophysiological investigations to map the field potentials produced in the spinal cord in response to brainstem and peripheral afferent stimulation - methods routinely in use in the Jordan lab.

- Intrathecal and intra-cerebral application of serotonergic and cholinergic drugs – methods used in the Slawinska laboratory as well as the Jordan laboratory.
- Use pharmacogenetic approaches to determine the involvement of specific identified neurons and receptors in the control of locomotion.

Our requirements for the Candidate are:

- Experience with and/or desire to learn electrophysiological and behavioral techniques for experimenting on intact and injured rats and mice.
- Basic knowledge of neuroscience.
- Experience with computer techniques for acquisition and analysis of data.

This is an attractive program, because the monthly stipend is high compared to other programs (1700Euro monthly for 4 years), and it offers opportunities for work both in Warsaw and in Winnipeg.

Candidates for Bio4Med International PhD Program must not have resided or carried out their main activity (work, studies, etc.) in Poland for more than 12 months in the past 3 years. Candidates should not be longer than 4 years after their Master's Degree.

The deadline is June 1, 2015, so there is not much time. The information about this program is attached in the poster.