Project 1.6. Modulation of the injured nerve microenvironment to support axon regeneration and spinal cord motoneuron survival

Supervisor: dr hab. Małgorzata Zawadzka

Laboratory: Laboratory of Neuromuscular Plasticity

Background:

The Ph.D. candidate will participate in the implementation of research tasks of the OPUS project, entitled " Modulation of the injured nerve microenvironment to support axon regeneration and spinal cord motoneuron survival - molecular mechanisms and functional implications".

Research tasks will focus on investigating whether modulating of expression of selected microenvironmental characteristics produced in the damaged peripheral nerves may result in axonal regeneration and reconstruction of neuromuscular connections, and ultimately restoration of lost motor functions.

The project will use both traditional neuroanatomical and neurophysiological methods as well as in vitro cell culture techniques and modern high-throughput molecular biology techniques.

Key responsibilities of Ph.D. candidate will include:

1. planning and conducting experimental work,
2. conducting experiments using in vitro cell cultures,
3. analysis of gene expression using RT-PCR and in situ hybridization,
4. participation in experiments conducted in vivo in animal models (rodents),
5. data analysis and reporting the results,
6. manuscript preparation.

Aim:

The aim of the project will be to investigate the role of experimentally selected inhibitors of regeneration of the damaged sciatic nerve by silencing their production and determining whether it will trigger functional improvement. In addition, the aim of the research will be to identify the specific profiles of gene expression in motor neurons at an early stage of their reaction to the nerve damage in the presence or absence of pro-regenerative signals.

Requirements:

- M.Sc. degree (or equivalent) in biology, molecular biology, biochemistry, biotechnology, medical or veterinary sciences
- exceptional motivation for the scientific research. Strong interest in the neuroscience.
- ability to perform experiments and analyse their results independently.
- hands-on experience in basic molecular biology and/or biochemistry techniques, fluorescent and confocal microscopy as well as in vitro cell culture.

- prior experience in working with animal models will be of advantage but is not mandatory – training will be provided.
- proficiency in spoken and written English
- previous experience with animal models will be of advantage but is not mandatory.
- general abilities: good work organization, creative thinking, ability to cooperate well as a part of a team.
- a list of scientific publications and/or references of the candidate's thesis tutor will be of advantage but is not mandatory.