

Effects of oxidative stress on adult neural stem cells

Master project

Department of Clinical Neuroscience, Karolinska Institutet
Autumn 2022 / Spring 2023

We are looking for a highly motivated master student to join our laboratory at Center for Molecular Medicine (CMM) Solna campus, earliest August 2022 for 6 months to a year. The project aims at dissecting the effects of inflammatory factors such as reactive oxygen species on the differentiation of neural stem cells (NSC). The more specific aim focuses on the transcription and phenotypic changes induced in NSC after exposure to hydrogen peroxide (H₂O₂).

Background

During injuries and inflammation in the central nervous system (CNS) NSCs are activated to proliferate and migrate into the injury. Our group works to identify mechanisms important for the regeneration from progenitor cells and how these mechanisms are affected by inflammatory mediators. In the H₂O₂ project, we have found that in response to H₂O₂ exposure NSCs show increased proliferation and shift to the oligodendrogenic fate. Oligodendrocytes are the cells predominantly effected during neurodegenerative diseases like Multiple Sclerosis. The aim of our research is to improve the CNS tissue restoration and limit the injury during neuroinflammation. Assessing the mechanisms behind oligodendrocyte differentiation is an important step to do so.

Description

The student will assess the impact of several candidate genes, obtained by RNAseq, on stem cell differentiation. The student will be introduced to various methods such as primary cell culture, cell transfections with DNA or siRNA, cell transductions with viral vectors, quantitative RT-PCR, immunocytochemistry and possibly work with different animal models for neurodegeneration. After an introductory period, the student is expected to work independently in the laboratory, collect and analyze data.

Please, send your CV to susanne.neumann@ki.se.

Contact information

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