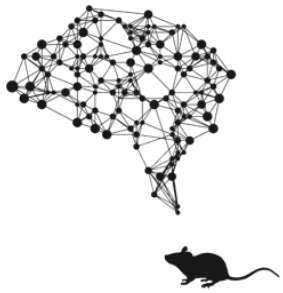
Master of Science Thesis in Neuroimmunology

Duration: 12 months

Dr. Sarah Mundt
Institute of Experimental Immunology (www.neuroimmunology.ch)

Prof. Aiman Saab
Institute of Pharmacology and Toxicology
(https://www.pharma.uzh.ch/en/research/neurohomeostasis.html)



Research Topic: Characterization of optic neuritis in mice
CNS neuroinflammatory demyelinating diseases, such as Multiple Sclerosis (MS), Neuromyelitis Optica Spectrum Disease (NMOSD), and Myelin Oligodendrocyte Glycoprotein Antibody Disease (MOGAD), present overlapping clinical features, including optic neuritis, which significantly impacts patients' vision and quality of life. Although traditional animal models, such as experimental autoimmune encephalomyelitis (EAE), capture some clinical and histopathological features of these diseases, they typically do not exhibit optic nerve involvement. This gap presents a major challenge in modeling and studying optic nerve-specific demyelination and neurodegeneration.
In this project, we aim to characterize a novel preclinical mouse model that uniquely displays robust inflammatory infiltration and demyelination in the optic nerve. By combining spectral flow cytometry, computational analysis, and advanced imaging, we will dissect the cellular and molecular mechanisms underlying immune cell infiltration and histopathological damage in the optic nerve. This model offers a promising platform for testing potential therapeutic strategies targeting optic neuritis and related neuroinflammatory damage in the CNS. The project will be co-supervised by Dr. Sarah Mundt and Prof. Aiman Saab, offering an interdisciplinary training experience in neuroimmunology and neuroscience.

Tasks/aims:
- Perform animal experiments (LTK 1 course required)
- Establish/adapt methodological approaches (e.g. designing high-dimensional flow cytometry and immunofluorescence panels)
- Computational analysis of cytometry data and published scRNAseq data (R, Phyton)

We offer:
- Access to cutting-edge research technologies
- A collaborative project between Neuroimmunology and Neuroscience
- Dynamic young and international teams in thriving and supportive research environments
- Regular group meetings and seminars discussing ongoing research projects

Requirements:
- Genuine interest in neuroimmunological research
- High intrinsic motivation
- Good communication skills and fluency in English
- Enthusiasm for Teamwork
- Experience in working with animals (mice) in flow cytometry (FlowJo) or programming skills are a plus

We are looking forward to your application. Please send your documents to:
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