

Master of Science Thesis in CNS autoimmunity

Towards a better understanding of the contribution of immune cells to neuropathological disease working at the interphase of Immunology and neuroscience

For 9-12 months in the laboratory of Dr. Sarah Mundt (www.neuroimmunology.ch)

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Research Topics:

1) Disentangling pathogenic and protective features of central nervous system (CNS) phagocytes

Mer proto-oncogene tyrosine kinase (MERTK) is a receptor involved in turnover of apoptotic cells and lipids. MERTK gene polymorphisms linked to susceptibility and varying disease activity in Multiple Sclerosis (MS), the most common chronic inflammatory disease of the CNS. Elevated levels of MERTK have been observed in brain lesions of patients with MS. MERTK is not only expressed by CNS resident cells including astrocytes and macrophages, but also by CNS infiltrating monocyte derived cells. In this project, we will disentangle the contribution of different MERTK expressing cellular subsets on neuroinflammation

2) 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. In this project, we will characterize a novel preclinical mouse model that uniquely displays robust inflammatory infiltration and demyelination 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.

Methods: The candidate will learn cutting edge research techniques such as conditional gene targeting, high-dimensional (spectral) flow cytometry, computational data analysis (R, Python), multiplexed immunofluorescence, and mouse models of MS (70% wet lab/ 30% dry lab)

Requirements

- Intrinsic motivation and curiosity for research
- Organisation and communication skills (English)
- Rigor and precision in experiments
- Strong team spirit

We are looking forward to your application. Please include a CV containing a brief statement of research experiences and send your documents to: mundt@immunology.uzh.ch