Master of Science Thesis Position

Duration: 9-12 months (start: spring 2023)

Where: In the laboratory of Dr. Sarah Mundt, Institute of Experimental Immunology, University Zurich: www.neuroimmunology.ch

Co-Supervisors:
PD Dr. Bettina Schreiner (Dep. of Neurology, USZ)
Dr. Sarah Mundt

Research Topic:
Profiling of Immune Checkpoint Inhibitor Induced Neuromuscular Inflammation to identify Therapeutic Pathways

Immune checkpoint inhibitor (ICI) therapy has become a powerful weapon in fighting cancer. However, ICIs can also cause autoimmune adverse events, including myasthenia-gravis-like disorders, neuritis, or myositis. A better understanding of the immune cell features of ICI-induced neuromuscular inflammation is clinically highly relevant, as it lays the foundation for further mechanistic studies and new therapeutic approaches. This study aims to uncover transcriptomic profiles in ICI-induced neuromuscular inflammation, to pin down pathways that may be targeted to treat such toxicities in patients.

Specifically, we will use novel cutting-edge single cell omics and algorithm-guided computational analysis to gain important insights into immune cell compositions of liquid and tissue biopsies of patients. The prospective candidate`s task will be to re-analyze publicly available single-cell RNA sequencing (seq) datasets from patients that developed ICI-related adverse events. We aim to identify adverse event specific pathogenic leukocyte signatures which can be used to screen immunotherapy patients and exploited as potential therapeutic targets.

Aims:
- Employ and adapt computational tools (e.g. Seurat, scvi-tools, etc.) to explore publicly available single-cell RNA seq data sets
- Characterize the immune compositions in liquid and tissue biopsies of ICI-treated cancer patients with neuromuscular inflammation as adverse event
- Develop high-dimensional flow cytometry panels to screen patient biopsies (CSF and blood) for pathogenic cell signatures (biomarker)

We offer:
- A translational project (biostatistics and immunotherapy research), with high clinical relevance
- Work in a dynamic young and international team in a thriving research environment at the Institute of Experimental Immunology, University Zurich
- Participation in weekly group meetings, journal flow and seminars

Requirements:
- Experience in bioinformatics (programming in R and/or Python)
- Genuine interest in immunological research
- High intrinsic motivation
- Good communication skills and fluency in English

Applications:

Applications (English or German) should include a CV containing a brief statement of research experiences.

Please send your application to: **bettina.schreiner@uzh.ch**