

Vorschlag für ein Promotionsprojekt im Rahmen des VorSPrUNG-Programms

Hauptbetreuer (VorSPrUNG-Konzept): Prof. Dr. Martin Weber

Project Title: "**Evaluation of Biomarkers for Disease Activity and Progression in Multiple Sclerosis**"

Multiple sclerosis (MS) is one of the most common immune-mediated neurological diseases of the central nervous system. Peripheral as well as central pathomechanisms require a targeted and effective therapy to prevent the disease activity and progression. In addition, biological markers that robustly reflect the risk of disease progression are still lacking.

The goal of this project is to gain a detailed understanding of the molecular differences in blood and cerebrospinal fluid samples from patients with MS. A direct comparison will be conducted between untreated patients with MS and those who have received a B-cell depleting therapy.

This includes quantifying destruction markers (neurofilament, GFAP, Tau) in both materials. In addition, an analysis of cytokines and chemokines (CXCL13, ChiL3, IL-10, IL-6, MCP1), recognized as critical mediators of the immune response in MS, will be performed. These factors will be tested for possible differences in their expression between the two patient groups in order to investigate their potential use in personalized therapy.

Accurate capture and analysis of these parameters could contribute to the improvement of clinical decision-making and individualization of MS therapy. It could also provide new insights into the mechanisms of disease progression and treatment success, potentially leading to the development of new therapeutic approaches.