



Project B03 - Molecular mechanisms and in vivo tracking of leukocyte penetration of the blood-brain barrier (BBB) in autoimmune CNS inflammation

Subcluster: Immune cell trafficking

Project Summary: The proteins MMP-2 and MMP-9 are essential for penetration of the blood-brain barrier (BBB). In their absence experimental autoimmune encephalomyelitis (EAE) – the animal model of Multiple Sclerosis (MS) - does not occur. They are produced by different cells and have different effects at the BBB. Data suggests that imaging of MMP-2/-9 activity is possible and that they are sensitive markers specifically for BBB penetrating immune cells. Considering this, our goal is to understand the function of MMP-2/-9 at the parenchymal border and to exploit MMP activity as an imaging biomarker for leukocytes penetrating the BBB in correlation to imaging of T cell dynamics in vivo. We intend to define the function of MMP-2/-9 at the BBB to better understand lesion formation and resolution. This will require correlation of MMP-2/-9 activity and function at the parenchymal border with dynamics of T cell populations. This information will be employed to correlate molecular imaging of T cell populations and MMP-2/-9 activity with conventional MRI imaging technologies in a hybrid PET-MRI approach in both EAE and MS patients.

Principal Investigators:

Prof. Dr. rer. nat. Lydia Sorokin

Institut für Physiologische Chemie und Pathobiochemie
Universität Münster
Waldeyerstraße 15
48149 Münster
Tel.: + 49 251 83 55581
E-Mail: sorokin@uni-muenster.de

Prof. Dr. med. Michael Schäfers

Klinik für Nuklearmedizin
Universitätsklinikum Münster
Albert-Schweitzer-Campus 1, Gebäude A1
48149 Münster
Tel.: +49 251 83 47362
E-Mail: schafmi@uni-muenster.de