

Current Openings

DFG Research Training Group “Parasite Infections”



Project Title:

Glycomics in toxoplasmosis – *Toxoplasma gondii* glycans in innate immune recognition and their diagnostic potential

Research Group:

Prof. Dr. Peter Seeberger (Vaccine Glycobiology) and Dr. Bernd Lepenies (Glycoimmunology), Max Planck Institute of Colloids and Interfaces

Address: Max Planck Institute of Colloids and Interfaces, Am Mühlenberg 1, 14476 Potsdam
Freie Universität Berlin, Institute of Chemistry and Biochemistry, Arnimallee 22, 14167 Berlin

Supervisor: Prof. Dr. Peter H. Seeberger / Dr. Bernd Lepenies

Project Description:

Infectious diseases caused by protozoan parasites are one of the greatest public health problems worldwide. The cell surface of protozoa contains a shell of complex glycolipids, including a high number of glycosylphosphatidylinositols (GPIs) in both protein-linked and non-protein-linked forms. However, the function of the GPI variations is largely unknown. Pathogen recognition by innate immunity is mediated through pattern recognition receptors (PRRs). C-type lectin receptors (CLRs) are PRRs that recognize glycan structures on the surface of pathogens. Initial data indicate that CLRs are involved in immunity to parasitic diseases, including helminths and *Leishmania*. Still, little is known about the recognition of parasitic glycans by CLRs and their role in immunity during parasite infections.

The project aims at analyzing *T. gondii* innate recognition on the molecular level. Binding of *T. gondii* to CLRs will be investigated and distinct ligands will be identified by ligand fishing and the glycan array platform. To elucidate the role of CLRs during toxoplasmosis *in vivo*, relevant CLR-deficient mouse strains will be infected with *T. gondii*.

A second major part of the project focuses on the establishment of a diagnostic test for toxoplasmosis. To this end, glycan arrays will be prepared using synthetic *T. gondii* glycans and screening of human serum samples from toxoplasmosis patients will be performed to detect anti-glycan antibody levels. In conclusion, this project aims at gaining a deeper insight into the *T. gondii* glycobiology.