Qian Chen

Phone: +49 3641 532-1375 Email: qian.chen@leibniz-hki.de

The role of complement in autoimmune disease

The complement system is a crucial component of innate immunity and a central effective system to fight infections, microbes and to maintain cellular integrity and tissue homeostasis. The activated complement system avoids invading of microorganisms and mediates the elimination of dead or modified self cells, but the over-activation may also damage host tissues. To prevent this, several complement regulators act as either facilitators or cofactors to control the spontaneously activated complement cascade. Any disturbance in this self-mediated balance can result in damage of tissues and in autoimmune disease. Therefore, insights into the mechanisms of complement regulation are critical for understanding disease pathology and accelerate the development of therapies for complement –associated diseases. The complement-related disease Membranoproliferative glomerulonephritis type II is caused by a defective surface activation of the glomerular basement membrane and accumulation of debris, which induces rare kidney disorder leads to mesangial cell proliferation and structural changes in glomerular capillary walls. MPGN is associated with inappropriate complement regulation, such as functional inactivation or absence of the regulator Factor H, the presence of autoantibodies against Factor H or to the C3 convertase. The goal of my project is to identify additional pathological identifications of MPGN, and I hypothesize that Factor H related proteins or C3 convertase components are relevant for pathology. They will update the current knowledge of such kinds of diseases and will define to the mechanisms of complement regulation.

Publications

Rudnick RB, Chen Q, Stea ED, Hartmann A, Papac-Milicevic N, Person F, Wiesener M, Binder CJ, Wiech T, Skerka C, Zipfel PF (2018) FHR5 Binds to Laminins, Uses Separate C3b and Surface-Binding Sites, and Activates Complement on Malondialdehyde-Acetaldehyde Surfaces. *J Immunol* 200(7), 2280-2290. Details PubMed

Busch C, Annamalai B, Abdusalamova K, Reichhart N, Huber C, Lin Y, Jo EAH, Zipfel PF, Skerka C, Wildner G, Diedrichs-Möhring M, Rohrer B, Strauß O (2017) Anaphylatoxins Activate Ca2+, Akt/PI3-Kinase, and FOXO1/FoxP3 in the Retinal Pigment Epithelium. *Front Immunol* 8, 703. Details PubMed

Zipfel PF, Skerka C, Chen Q, Wiech T, Goodship T, Johnson S, Fremeaux-Bacchi V, Nester C, de Córdoba SR, Noris M, Pickering M, Smith R (2015) The role of complement in C3 glomerulopathy. *Mol Immunol* 67(1), 21-30. Details PubMed

Chen Q, Müller D, Rudolph B, Hartmann A, Kuwertz-Bröking E, Wu K, Kirschfink M, Skerka C, Zipfel PF (2011) Combined C3b and factor B autoantibodies and MPGN type II. *N Engl J Med* 365(24), 2340-2342. Details PubMed

Supervisor

Peter F. Zipfel

Co-Supervisors

Gunter Wolf

Start of PhD

March 1, 2010

Doctoral Disputation

November 14, 2014