Ramona Rudnick

Characterization of Complement Factor H Related Protein 5 (CFHR5)

The complement system is a crucial part of the innate immunity and maintains various physiological functions. Complement protects host cells from microbial infection, mediates inflammation, contributes to silent, non-inflammatory removal of altered host cell material and links the innate and adaptive immunity. However, complement needs to be tightly controlled. To ensure the balance between activation and inhibition and to maintain homeostasis a large number of regulators exist. These regulators include the well characterized alternative pathway inhibitor factor H and the five complement factor H related proteins (CFHR1-CFHR5). All proteins play an important role in complement regulation. The regulator protein CFHR5 moved into focus during the last years, because copy number variations (CNVs) in the CFHR5 gene are associated with the rare kidney disease C3-glomerulopathy. At present no specific therapy exists for this severe renal disorder. Physiologically CFHR5 binds to damaged host cells, serves as a complement activator and recruits properdin. Thus, CFHR5 triggers the local complement activation. However, the exact physiological functions of CFHR5 are not known in detail. The main goal of my PhD project is to provide further insights how CFHR5 regulates complement and to elucidate how CFHR5 mutants identified in patients contribute to the development of C3-glomerulopathy.

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

Supervisor

Peter F. Zipfel

Start of PhD

January 1, 2016

Doctoral Disputation

December 17, 2019