

## Development of Carbohydrate-based Mimics as Ligands for Complement-related Lectins

**Project description:** The research project involves the design, chemical synthesis and *in vitro* evaluation of novel carbohydrate mimics as potential high-affinity binders for complement-related lectins, e.g., the ficolins. The ficolins are oligomeric lectins that have been identified as pattern recognition receptors (PRRs) of the complement system's lectin pathway for a wide range of disease-triggering pathogens, including eukaryotic protozoa, bacteria, and viruses, and also play a major role in the pathogenesis of several autoimmune diseases. Furthermore, over-activation of complement can cause adverse thromboinflammatory states. Therefore, there is an unmet need to elucidate this interaction network on a molecular level and to develop glycomimetic entities to inhibit (or enhance) such recognition events.

The student will obtain training in various methods, including,

- Chemical synthesis of carbohydrates and mimics thereof
- Structural analysis of novel compounds using NMR, MS, IR, optical rotation
- *In vitro* evaluation of antagonists (in collaboration with PD Dr. Said Rabbani)
- Design of potential ligands (in collaboration with Computational Pharmacy group)

This project will be suitable for motivated master's students (University of Basel, or external) with an high interest in chemical (carbohydrate) synthesis and medicinal chemistry.