Development of Glycomimetics for Targeting Human Immune Lectins

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Lectins on the surface of human immune cells are a key element of the innate immune surveillance where they constantly sample potential antigens from their environment and present it to the adaptive immune system. Therefore, targeting certain C-type lectin receptors has been found to be a promising avenue for improving vaccine efficacy.

Certain pathogens have taken advantage of this internalization pathway to infect immune cells and tumor cells have developed mechanisms to suppress recognition by immune cells by overexpressing self-glycans that bind certain immune cells. Taken together immune lectins have become important target receptors for the development of vaccine adjuvants and cancer therapies and for the treatment of autoimmune diseases.

Here we report on our current strategies for the development of glycan mimetics to target several immune lectins with higher affinity and selectivity than natural glycans involving chemo enzymatic synthesis of glycan scaffolds, library generation via click chemistry, high throughput screening and determination of binding constants of selected hits.