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Project :	Arrays of ganglioside fragments for the detection of Guillain-Barré subtypes
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Fields of interest:	Glycochemistry, glycobiology, biosensory, organic chemistry, microarrays, surface modification.
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Introduction

Guillain-Barré Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy affecting the peripheral nervous system (PNS). In most cases, the infection preceding GBS is caused by enteritis of the bacterium *Campylobacter jejuni (C. jejuni)*. Once an infection has occurred, the host's immune system forms antibodies against oligosaccharide structures displayed on the pathogen. These carbohydrates closely resemble glycosphingolipids that are part of the host's PNS tissue (*e.g.* ganglioside GM1, figure 1 left), which are subsequently also attacked by the immune system. This leads to serious neurophathological symptoms, which are frequently fatal.

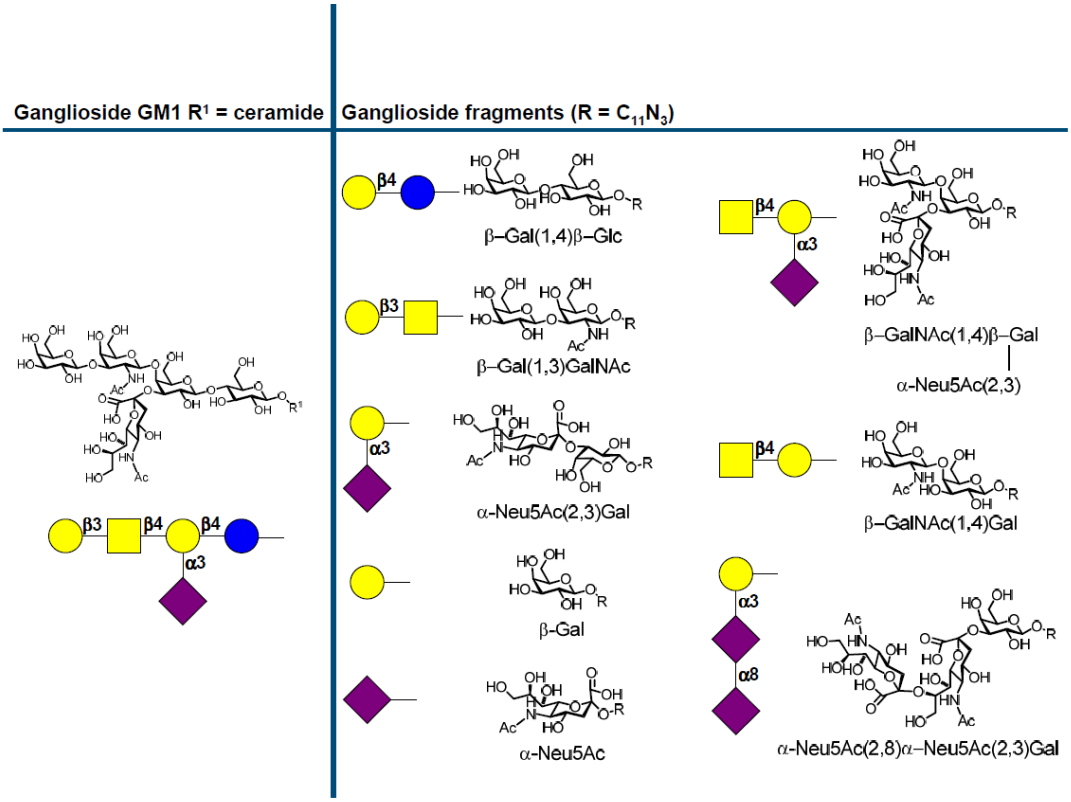

Figure 1. (left) Ganglioside GM1. (right) Ganglioside fragments that are synthesized in this project and used for the detection of anti-GM1 antibodies.

Goal

The Goals of this project are to synthesize ganglioside GM1 epitopes (Figure 1b) and use these for application in biosensors for the detection of Guillain-Barrè Syndrome. These compounds will be tested on their ability to be recognized by anti-GBS antibodies and ultimately, the ganglioside fragments will be immobilized on silicon or siliconnitride surfaces via copper-catalyzed azide-alkyne cycloadditions (CuAAC) and strain-promoted azide-alkyne cycloadditions (SPAAC). Detection of anti-GM1 antibodies is successfully performed on enzyme-linked immunosorbent essays (ELISAs).

Further research

Further research conveys additional ELISA experiments on the detection of anti-GM1 antibodies and will ultimately be performed on human anti-GBS antibodies. Also other microarray techniques will be used for the detection of these antibodies. Ultimately, the fragments will be applied in a GBS biosensor for the early detection of this ailment.

Acknowledgement

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References

1. Jaime Garcia-Hartjes *et al*. *Chem*. *Sci*. **2010**, manuscript under review