

Glycoconjugate Vaccines Against Bacterial Infections Based on Synthetic Glycans

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Most pathogens, including bacteria, fungi, viruses and protozoa, carry unique sugars on their surface. Currently, several glycoconjugate vaccines against bacteria are successfully marketed. Since many pathogens cannot be cultured and the isolation of pure oligosaccharides is difficult, synthetic oligosaccharide antigens are an attractive alternative. In this plenary lecture I will describe a medicinal chemistry approach to the development of semi- and fully synthetic glycoconjugate vaccines against severe bacterial infections, including resistant hospital microorganisms. This approach is fueled by oligosaccharides prepared by automated glycan assembly^{1,2} that has been commercialized.³ Quality control of synthetic oligosaccharides is ensured by ion mobility mass spectrometry (IM-MS).⁴

Vaccine programs aimed at protection from a series of *Streptococcus pneumoniae* serotypes,⁵ *Clostridium difficile*⁶ and *Klebsiella pneumoniae*⁷ have progressed to the late preclinical stages and are now advanced to the clinic by *Vaxxilon AG*.

Synthetic oligosaccharides serve as basis for tools such as glycan microarrays and for the production of monoclonal antibodies.

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