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Fluorinated anti-bacterial antigens for synthetic carbohydrate based vaccines

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Owing to their structural uniqueness and dense distribution on the surface of pathogenic organisms, carbohydrate antigens are interesting target compounds for vaccine development. A major drawback of carbohydrate based vaccines is their often insufficient immunogenicity and limited bioavailability which might lead to poor immune responses. Strategic fluorination of glycans is an increasingly employed approach to overcome these limitations and several fluorinated carbohydrate-based vaccine candidates have been reported to date. We have recently started to apply this concept to different anti-bacterial capsular polysaccharide (CPS) structures, including Streptococcus pneumoniae (SPn) type 14 and type 8, as well as to modified fragments of the highly invasive Gram-negative Neisseria meningitidis (Men) type Y antigen. Thus principles, strategies and challenges for direct fluorine incorporation into a given antigenic glycan moiety will be presented to allow investigations on the impact of such fluorinations on antibody recognition and vaccination efficacy.

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