MODELLING INSIGHTS INTO GROUP B STREPTOCOCCUS CPS: USEFULLY INFORMING VACCINE DESIGN AND PROCESSING

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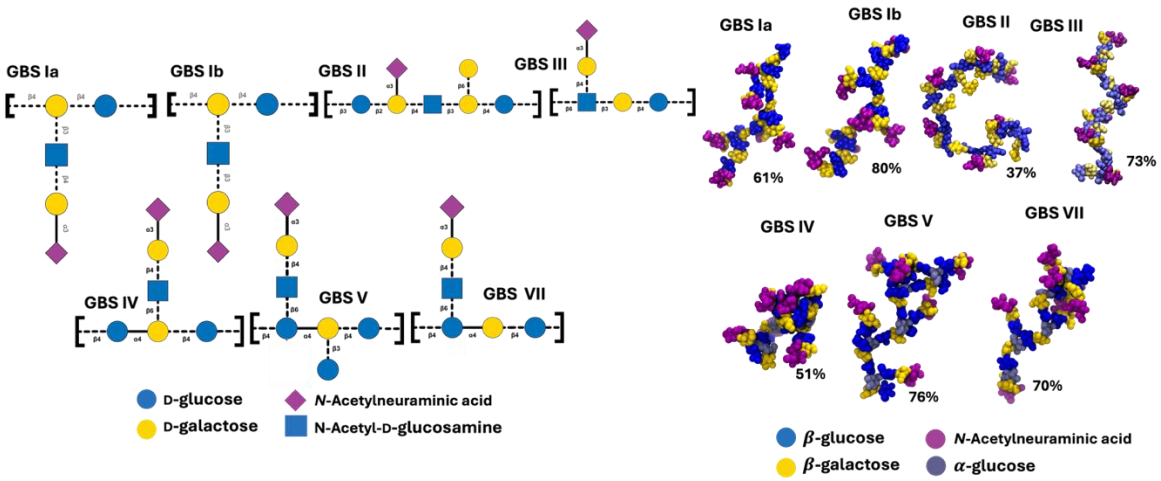
Group B Streptococcus (GBS) is a bacterial pathogen causing significant morbidity and mortality in pregnant women and infants especially in resource-limited settings [1]. Vaccination is a promising approach to reducing disease burden and overcoming antimicrobial resistance [2]. As such, hexavalent vaccine candidates are in development, incorporating the capsular polysaccharides (CPSs) of the most prevalent serotypes (Ia, Ib, II, III, V and IV or VII) as CPS [3]. Such a vaccine is predicted to have a significant impact on reducing disease burden through both direct and cross-protection [4].

Cross-reactivity and resulting cross-protection against different antigens occurs when common conformational epitopes are present. Polysaccharide conformation is difficult to study with laboratory techniques, thus we performed molecular modelling studies comparing the conformation and dynamics of GBS CPSs. Our comparative analysis reveals key conformational differences that provide mechanistic rationale for observed vaccine processing challenges as well as immunologic differences that could account for cross-protection or lack thereof. Ultimately this work links CPS antigen structure to conformation and function providing deeper mechanistic understanding of the immunologic aspects of antigen selection supporting multivalent vaccine development to reduce GBS-related infant and maternal mortality.



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