

ID: 21622

**A SMALL LIBRARY OF COMPOUNDS, CONTAINING THE COMMON DISACCHARIDE OF STREPTOCOCCUS PNEUMONIAE 19F AND 19A CAPSULAR POLYSACCHARIDES, AS NOVEL NON-NATURAL ANTIBACTERIAL SACCHARIDE ANTIGENS.**

L. Morelli<sup>2</sup>, F. Chiodo<sup>1</sup>, L. Lay<sup>3</sup>, F. Compostella<sup>2</sup>

<sup>1</sup>*Amsterdam Infection and Immunity Institute, Amsterdam UMC, The Netherlands.*

<sup>2</sup>*Dipartimento di Biotecnologie Mediche e Medicina Traslazionale, Università degli Studi di Milano, Via Saldini 50, 20133, Milano.*

<sup>3</sup>*Dipartimento di Chimica, Università degli Studi di Milano, Via Golgi 19, 20133, Milano.*

Pneumonia is one of the most serious respiratory infection worldwide, and it is mainly caused by *Streptococcus pneumoniae* (SP) bacterium. The polysaccharide capsule (CPS) of SP is a major virulence factor. Commercially available vaccines are made of purified CPS fragments of the most virulent serotypes. Pneumococcal conjugate vaccines (PCVs) work well and, even if they are not able to prevent all infections, they have substantially reduced the incidence of invasive pneumococcal disease caused by the most virulent serotypes. However, ninety-eight different pneumococcal serotypes have been identified, classified into serogroups on the base of structural, biochemical and genetic differences in the CPS structure. Serotype replacement with emergent serogroups, not included in vaccine formulations, remains a concern. Since we are still distant from achieving a universal not serotype-dependent vaccine, we have considered to simplify PCV formulations designing novel non-natural saccharide antigens common to more than one serotype. In this context, we envisaged a potential antigen composed of common structures shared by different serotypes. In particular, SP 19F and 19A CPS repeating units share a common structure, the disaccharide ManNAc- $\beta$ -(1 $\rightarrow$ 4)-Glc, that can be considered the parent motif for the selection of a “common epitope”. Therefore, we have synthesized a small library of compounds, containing different combinations of the common 19F/19A disaccharide and bearing an aminopropyl spacer at the reducing end to allow conjugation. Each compound will be biologically evaluated through glycan-arrays screening to reveal the presence of common antibodies protective both for 19F and 19A serotypes.