

# **Immunogenicity and mechanisms of action of PnuBioVax, a multi-antigen serotype-independent prophylactic vaccine against infection with *Streptococcus pneumoniae*.**

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## **Abstract**

*Streptococcus pneumoniae* has multiple protein antigens on the surface in addition to the serotype specific polysaccharide capsule antigen. Whilst the capsule antigen is the target of the polysaccharide vaccines, bacterial proteins can also act as targets for the immune system. PnuBioVax (PBV) is being developed as a multi-antigen, serotype-independent prophylactic vaccine against *S. pneumoniae* disease. In this study we have sought to elucidate the immune response to PBV in immunised rabbits. Sera from PBV immunised rabbits contained high levels of IgG antibodies to the PBV vaccine, and pneumococcal antigens PspA, Ply, PsaA and PiuA which are components of PBV, when compared with control sera. The PBV sera supported killing of the vaccine strain TIGR4 in an opsonophagocytic killing assay and heterologous strains 6B, 19F and 15B. In addition, incubation in PBV sera led to agglutination of several strains of pneumococci, inhibition of Ply-mediated lysis of erythrocytes and reduced bacterial invasion of lung epithelial cells in vitro. These data suggest that PBV vaccination generates sera that has multiple mechanisms of action that may provide effective protection against pneumococcal infection and give broader strain coverage than the current polysaccharide based vaccines.