All inclusive: multiplexing the anti-polysaccharide and anti-protein antibody response during pneumococcal infections

Ger T Rijkers (1,2), Femke Goedegebuure (2), Stefan MT Vestjens (1), Willem van Wamel (3), and Bob Meek (1).

(1) Laboratory for Medical Microbiology and Immunology, St Antonius Hospital, Nieuwegein

(2) Science Department, University College Roosevelt, Middelburg

(3) Department of Medical Microbiology and Infectious Diseases, Erasmus MC, Rotterdam

The Netherlands

*Streptococcus pneumoniae*, the pneumococcus, is the leading cause of bacterial meningitis, pneumonia, otitis media, and bacteremia both for the very young (i.e. children below the age of 2 years) and of elderly. *S. pneumoniae* is an encapsulated bacterium and the capsule comes in 93 different types (serotypes). This is a challenge for the immune system, for vaccine producers, and for medical immunologists who want to measure the antibody response against all these different serotypes. We have taken up the challenge to develop an all-inclusive Luminex assay for these anti-polysaccharide antibodies and currently have a 25-plex. The Rotterdam laboratory has developed a multiplex assay for 15 different pneumococcal surface proteins. In serum pairs of Bangladeshi children with pneumonia, we have determined the change in anti-polysaccharide antibodies during the course of the disease, and compared that to anti-protein antibodies. For the polysaccharides, we find in most cases a specific response against a single serotype. The surface proteins, which should be expressed by every pneumococcal serotype, induce a response in a fraction of the patients, but also a decrease in antibody titers may be found. Full interpretation of the data will now also require bacteriological data.