STATENS SERUM INSTITUT (SSI)
Center for Vaccine

STATENS SERUM INSTITUT

Tuesday, 26 April 2016

IDENTIFYING NEW VACCINE TARGETS AGAINST STREPTOCOCCUS PYOGENES

PRESENTATION BY SENIOR SCIENTIST JES DIETRICH, STATENS SERUM INSTITUT

An efficient vaccine requires the correct vaccine antigen and induction of the optimal immune response against this antigen. At SSI we have investigated both the infection induced immunity in humans and also initiated an extensive GAS antigen discovery program. Concerning the antigen discovery, we show that by combining a maskless photolithographic strategy with ordinary solid phase peptide synthesis, an ultrahigh-density peptide microarray with approx. 500.000 individual 15-mer peptides spanning the entire GAS genome could be generated. The chip was incubated with serum from healthy adults or children, that had previously been infected with GAS, and binding of human serum antibodies to each of the peptides was detected. More than 349 proteins contained peptide epitopes with a strong binding of human antibodies, and some were found to induce protection against infection with GAS. Concerning anti-GAS immunity, our results on the natural immunity against GAS in both adults and children indicate a response dominated by Th1 T cells combined with an IgG1/IgG3 dominated humoral immunity. The future perspectives of these results are discussed.

FAILURE OF NATURAL INFECTION TO INDUCE IMMUNITY TO GROUP A STREPTOCOCCUS: OVERCOMING IMMUNE RESISTANCE VIA VACCINATION WITH A CONSERVED M PROTEIN PEPTIDE

PRESENTATION BY PROFESSOR MICHAEL GOOD, INSTITUTE FOR GLYCOMICS, GRIFFITH UNIVERSITY, AUSTRALIA

Streptococcal pyoderma is responsible for Australia's Indigenous populations suffering the highest rates of rheumatic heart disease worldwide. From an immunological perspective, the cause of the epidemic is poorly understood. There are in excess of 250 different strains of GAS, and it is known that antibodies to the amino-terminal segment of the M protein can kill organisms in a strain-specific manner *in vitro*. It was assumed that sequence diversity was solely responsible for the prolonged time period required to develop immunity. Michael Good used endemic strains from the Northern Territory of Australia to model the acquisition of natural immunity. Surprisingly, infection with one strain led to short-term protection only. Immunological memory did not develop. Two sequential infections with the same strain within a short time frame were required to induce enduring strain-specific immunity. Mice exposed to multiple strains did not develop antibodies to a conserved M protein vaccine peptide, J8, demonstrating that this epitope is cryptic. However, in contrast, immunity following vaccination with J8 protects against multiple strains delivered sequentially or as a co-infection. This study describes a major reason why immunity to GAS pyoderma is so slow to develop, but shows that vaccination with J8 can prevent infections with multiple strains.

PROGRAMME

14:00 – 14:05	Welcome to the SSI
14:05 – 14:30	Identifying new vaccine targets against streptococcus pyogenes *Sr. Scientist Jes Dietrich, Statens Serum Institut*
14:30 – 15:30	Failure of natural infection to induce immunity to group A streptococcus: Overcoming immune resistance via vaccination with a conserved M protein peptide *Professor Michael Good, Griffith University*

WHERE

Statens Serum Institut, Artillerivej 5, 2300 København S
The Canteen, building 37, room 108

Please go to the reception upon arrival for sign-up and ID-card.

WHEN

Tuesday, 26 April 2016 at 14:00-15:30.

REGISTRATION

It is not necessary to register for this event. Attendance is free of charge.

If you think that anyone else in your network could be interested in attending this seminar, please feel free to forward this invitation (with cc to: paho@ssi.dk)