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NOVEL *STREPTOCOCCUS PNEUMONIAE* PROTEIN ANTIGEN VACCINE AND THE NATURE OF THE IMMUNE RESPONSE ELICITED BY THEM

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Mortality due to pneumococcal infections remains high worldwide, augmented by widespread antibiotic resistance in many pneumococcal strains. To identify protein antigens that may be involved in the development of protective immunity to S. *pneumoniae*, a pneumococcal cell wall protein-enriched extract was screened using 2-D gel electrophoresis and immunoblotting with sera obtained longitudinally from children attending day-care centers and sera obtained from mice immunized with the pneumococcal cell wall protein-enriched extract. The identified proteins that share no- or low- homology to human proteins and that are conserved among different S. *pneumoniae* strains were tested for their ability to elicit protection against S. *pneumoniae* challenge in animal models. Moreover the nature of the elicited immune response was studied in mice. S. *pneumoniae* proteins PtsA, GtS, Nox, FlaR, FBA, TF and PTS^{MAN} were amplified from TIGR4 strain, cloned, expressed and purified. Mice were immunized three times subcutaneously with these proteins in the presence of adjuvant and challenged two weeks later. Nasopharyngeal and lung colonization levels were quantified 48 hrs following bacterial challenge or survival was monitored daily for seven days following challenge. The cytokine profile elicited by rFBA was determined by multiplex ELISA. All seven proteins elicited protective immune responses in mice as determined by reduced nasopharyngeal and lung colonization, prolonged survival, and the ability of antibodies obtained from immunized mice to ex-vivo neutralize bacterial pathogenicity in the intraperitoneal challenge model. Moreover, rFBA elicits Th1/Th2/Th17-type cytokines in mice. Immunization with immunogenic proteins elicits protective immune responses in mouse challenge systems and the induction of Th1, Th2 and Th17 type of immune responses. Taken together several antigenic and immunogenic protein with no or low homology to human protein are were identified and found to elicit protective immune response in the mouse model accompanied by Th1, Th2 and Th17 type protective immune responses.

Biography

Yaffa Mizrachi Nebenzahl has completed her PhD at The Weizmann Institute, Rehovot Israel and Postdoctoral studies at NIH, USA and UCLA School of Medicine. She is the Director of Molecular Microbiology laboratory in the Shraga Segal Department of Microbiology, Immunology and Genetics at the Faculty of Health Sciences in Ben Gurion University of the Negev, Beer Sheva, Israel. She has published more than 65 papers in reputed journals.

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