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Recombinant chimeric protein PSPF as novel vaccine against *Streptococcus pneumoniae*

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Objectives: *Streptococcus pneumoniae* is the leading cause of bacterial infections among adults and children. Recombinant polypeptides vaccines, based on the conservative and immunogenic sites of surface pneumococcal proteins could be an advantageous vaccine alternative.

Methods: A chimeric recombinant protein named PSPF was constructed from conservative and immunogenic fragments of *S. pneumoniae* surface proteins PspA, Spr1875, PsaA and the *S. typhiurium* flagellin terminal domains FliC1 and FliC2. PSPF protein was expressed in *E.coli* and used for immunization of the inbred or line mice (BALB/c and Albino Swiss) which were later infected with different *S. pneumoniae* serotypes. Specific humoral immune response was evaluated by ELISA. Protective efficacy was evaluated according to survival rates or lung and blood bacterial cell counts. Experiments with animals were performed with the necessary ethical requirements.

Results: PSPF showed a high immunogenic activity when applied by intranasal or subcutaneous routes. Specific IgM, IgG and IgA were detected in serum and broncho-alveolar fluid. PSPF-specific IgG recognized all *S. pneumoniae* serotypes studied. PSPF immunization increased resistance of adult BALB/c mice to lethal intraperitoneal infection with serotype 19F (25-40%) and intranasal infection with serotype 3 (25%). PSPF-immunized infant Swiss mice showed an improved clearance of serotypes 3, 6B, 14 and 19F from the lungs and complete absence in blood. The addition of *Lactobacillus rhamnosus* strain as PSPF adjuvant significantly improved results of vaccination.

Conclusion: Studies in mice models demonstrated that recombinant chimeric protein PSPF is immunogenic and improves protection against *S. pneumoniae* infection.

Biography

Alexander Suvorov is presently acting as Head of Molecular Microbiology division of Federal, State Budgetary Scientific Institution "Institute of Experimental Medicine" in Russia

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