

Process development and immunogenicity studies on a serogroup 'X' meningococcal polysaccharide conjugate vaccine

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Meningococcal serogroup X (MenX) is responsible for recent outbreaks of meningitis reported in sub-Saharan region of Africa. Although protective polysaccharide conjugate vaccines are available against serogroups A, C, Y and W but they are not effective against MenX. An efficacious, monovalent conjugate vaccine was designed against MenX and a fed-batch fermentation process was developed. The MenX polysaccharide (PS) was purified and yield estimated to be 15-fold higher than the reported elsewhere. Structure of MenX polysaccharide was confirmed by ¹H, ¹³C NMR spectroscopy analysis. The MenX polysaccharide is a homopolymer of N-acetyl-D-glucosamine-4-phosphate residues held together by alpha (1-4) phosphodiester bonds without O-acetyl groups. Molecular weight of MenX polysaccharide was found to be 310 kDa using HPLC-SEC coupled to refractive index (RI) detector. The MenX-Tetanus toxoid (TT) monovalent conjugate proved to be highly immunogenic in mice, and the bactericidal titers of MenX-TT conjugate were 10-fold higher than native PS. Increasing the dose of MenX-TT conjugate from 0.5 µg to 1.0 µg induced an 8-fold higher antibody titer as well as serum bactericidal titer. The current work suggests that the MenX-TT conjugate is a candidate vaccine against meningitis caused by Meningococcal group X strains.

Biography

Srinivas Reddy did his PhD from Indian Institute of Technology, Chennai. He is working as a Senior Manager at Serum Institute of India Ltd. He has 15 years of industrial experience in research and development worked in major biotech companies in India. He has published international papers and also has process patents in the area of vaccine and therapeutic monoclonal antibody development.

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