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Immunogenicity and protective efficacy of a novel Vi-conjugate vaccine against *S. typhi*

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Salmonella enterica serovar Typhi (*S. typhi*), a facultative intracellular pathogen with a global morbidity rate of ~10%, is a major threat to public health worldwide. The most widely used Vi-polysaccharide-based vaccine provides inadequate protection to young children where the disease is most prevalent due to the lack of T cell-dependent immunity. Recently approved Vi-conjugate vaccine to a carrier protein (Vi-DT or Vi-TT) reported enhanced protection. To search for a better vaccine, we conjugated Vi-polysaccharide to T2544, an immunogenic outer membrane protein of *S. typhi* and studied the immunogenicity and protective efficacy of the candidate conjugate vaccine against *S. typhi* infection in a mouse model. Antibody-dependent cellular cytotoxicity assays showed effective lysis of *Salmonella*-infected EL4 cells opsonized with antibodies against Vi-T2544 conjugate by NK cells. Candidate conjugate vaccine-specific cytotoxic T lymphocytes (CTLs) were also capable of lysing *Salmonella* infected EL4 cells. Effector B cells against both rT2544 and Vi-polysaccharide and memory B cells against T2544 were detected in the immunized mice by ELISPOT assays. In addition, Vi-rT2544 induced maturation of dendritic cells (DCs), and antigen-pulsed DCs were capable of inducing T cell proliferation. Both DCs and T cells produced significant amounts of Th1 cytokines that is essential for combating *Salmonella* infections. Immunization of mice with the conjugate vaccine conferred protection against *S. typhi* infection, thereby validating the previous observations. In summary, the candidate vaccine may serve as an improved alternative to currently available Vi vaccines, which may also be effective against Vi negative strains.

Biography

Sayan Das has completed his MSc from the Department of Biotechnology, University of Calcutta. He qualified the joint CSIR-UGC test for junior research fellowship in 2010 and is currently pursing PhD under the guidance of Dr. Santasabuj Das, Scientist E, NICED, Kolkata. He has also co-authored a publication in a peer-reviewed journal.

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