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Immunogenicity and protective efficacy of live trans-conjugant *Shigella* hybrid (LTSH) strain in animal model

Ushasi Bhaumik, Hemanta Koley and Dhrubajyoti Nag National Institute of Cholera and Enteric Diseases, India

An avirulent, live trans-conjugant *Shigella* hybrid (LTSH Δ stx) strain was constructed in our earlier study by introducing a plasmid vector, pPR1347 carrying both the RFB gene cluster and the RFC gene of *Salmonella typhimurium*, into a Shiga-toxin gene deleted *Shigella dysenteriae*. Trans-conjugants were Sereny negative and were unable to invade the HeLa cells. Trans-conjugants exhibited strong cross reactivity with *S. dysenteriae* 1 antisera but they showed weak reaction with *Salmonella typhimurium* antisera. Serum IgG and IgA titers showed exponential increase during oral immunization and peaking on the 28th day and remained at that level till the 120th day in both the rabbit and the mouse models. Antigen specific sIgA was also determined from intestinal lavage of immunized mice and fecal sample of immunized rabbits. Protection studies showed 100% homologous and up to 70% heterologous protection against the challenge with wild type *shigella* in rabbits and mice model. Three successive oral administrations of LTSH Δ stx to female adult mice produced comprehensive passive homologous and heterologous protection in their offspring against challenge with wild type circulating *shigellae*. The stomach extracts of neonates from immunized mice, mainly containing mother's milk, contained significant levels of anti-LTSH Δ stx immunoglobulin. These studies suggest that the LTSH Δ stx can be a new live oral vaccine candidate against shigellosis in the near future.

Biography

Ushasi Bhaumik completed her MSc in Biotechnology in 2014. She has joined the lab in National Institute of Cholera and Enteric Disease for her PhD under Dr. Hemanta Koley. She is a DST-INSPIRE fellow. She is currently focused on "Outer membrane vesicle of *Shigella* and its immunomodulatory role on immune system".

bhaumikushasi7@gmail.com

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