



Typhoid Vaccine Candidate effective against both Typhoid and Paratyphoid Vaccine

TECHNOLOGY AVAILABLE FOR TRANSFER

UNMET NEED & OPPORTUNITY

The currently available vaccine for Typhoid fever do not provide protection against *S. paratyphi A* infection. This technology specifically addresses this challenge. The incidence of typhoid fever caused by *S. typhi* and *S. paratyphi* varies geographically, with south-central and south-east Asia having the highest incidence—typically exceeding 100 cases per 100,000 person-years for typhoid and with lower, variable rates for paratyphoid. In one multicenter study, the annual incidence of typhoid per 100,000 children aged 5–15 years was 180 in North Jakarta, Indonesia, 413 in Karachi, Pakistan and 494 in Kolkata, India in the year 2008. There is a need to develop a vaccine for effective control of Paratyphoid.

TECHNOLOGY

The present invention relates to a novel consortium for a potent vaccine for enteric fever, comprising of specific strains of Salmonella Typhi and Salmonella paratyphi A in equal proportion. The technology provides a simple yet effective consortium comprising of isolated Outer Membrane Vesicles (OMV) of the two strains in equal proportion. No protective proteins, excipients or antibiotics have been incorporated.

The cause of improvisation is the increased incidence of Enteric fever, responsible for over 20 million illnesses and 200,000 deaths each year. *S. Paratyphi A* accounts for a substantial and increasing proportion of these cases, as high as 90% in some regions of Asia. There are currently no vaccines directed against *S. Paratyphi A*, although there some candidates in preclinical and phase 1 trials. There is long pressing need for a vaccine for control of Paratyphoid.

1. <https://www.who.int/immunization/research/development/typhoid/en/>
2. <https://www.marketwatch.com/press-release/typhoid-fever-vaccines- market-to-surpass-us-5544-million-by-2026-coherent-market-insights-2019- 03-15>
3. The Burden of Typhoid and Paratyphoid in India: Systematic Review and Meta-analysis
4. <https://www.medindia.net/drug-price/typhoid-vaccine-live/typbar.htm>
5. <https://dir.indiamart.com/impcat/typhoid-vaccine.html>

UNIQUE SELLING PROPOSITION

A vaccine effective against both *S. typhi* and *S. paratyphi A* infection having:
Immunogenicity – 80-100%
Reactogenicity - No
Protection Efficacy – 80-100%

STAGE OF DEVELOPMENT

- Proof of concept is established by demonstrating the efficacy of vaccine in animal model i.e. mice.
- In-house Lab Validation

ADVANTAGE

1. Easy purification of outer membrane vesicles
2. Vaccine is effective against infectious disease caused by both *S.typhi* and *S. paratyphi A*

APPLICATIONS

BOMV Vaccine development against Enteric fever or Typhoidal fever.

INTELLECTUAL PROPERTY

Patent application filed in India in 2017

LICENSING OPPORTUNITY

BCIL is looking for an industrial partner for commercialization of Bivalent OMV vaccine for protection against Typhoid fever.

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