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A Lipidated Multi-Epitope Vaccine Comprising MHC-I and MHC-Ii Binder Peptides Elicits Protective Cd8 T Cell And Cd4 T Cell Immunity against Tuberculosis

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The clinical trials suggest that BCG fails to protect against tuberculosis (TB) in TB-endemic population. Recent studies advocate that non-tuberculous mycobacteria (NTM) and latent *Mycobacterium tuberculosis (Mtb)* infection interferes in the antigen processing and presentation of BCG to induce protective immunity against *Mtb*. Thereby, indicating that any vaccine that require exhaustive antigen processing may not be efficacious in TB-endemic zones. Recently, we have demonstrated that single epitope based vaccine (L91), conferred better protection than BCG. In this study, we constructed a multi-stage based multi-epitope vaccine, comprising of promiscuous MHC-I and MHC-II binding peptides of active (TB10.4, Ag85B) and latent (Acr1) stages of *Mtb* antigens respectively, conjugated to TLR-2 agonist Pam2Cys (L4.8). L4.8 significantly elicited both CD8 and CD4 T cell immunity as evidenced by increase in enduring polyfunctional CD8 and CD4 T cells. L4.8 efficiently declined *Mtb*-burden and protected animals better than BCG and L91, even at late stage of *Mtb* infection. The animal data related to T cells, were replicated using PBMCs of BCG-vaccinated healthy subjects. This study emphatically denotes that L4.8 can be a promising future vaccine candidate for controlling active and latent TB.

Biography:

Javed N. Agrewala, born in Agra in the Indian state of Uttar Pradesh, graduated in science from Dr. B. R. Ambedkar University in 1980 and earned a master's degree from the same institution in 1982 after which he did his doctoral studies at Sarojini Naidu Medical College to secure a PhD in 1986. In 1989, he joined Institute of Microbial Technology, Chandigarh as a faculty member and scientist where he has been working since then and serves as the chief scientist and professor. In between, he had two sabbaticals, initially at Royal Postgraduate Medical School of Hammersmith Hospital (1994–1996) and later at Trudeau Institute (2001–2002). In 2014, he was short-listed among the three possible candidates to become the vice chancellor of the University of Kashmir but the position eventually went to Khurshid Iqbal Andrabi. At IMT, he heads a laboratory, The Agrewala Lab, where he hosts a number of researchers and students engaged in the studies on self-adjuvanting peptide vaccines and immunomodulation therapy and serves as a biosafety officer.