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A novel mucosal lipopeptide based vaccine against mycobacteria

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Tuberculosis (TB) is a major global health threat to humans, with 9.3 million new cases and 2 million deaths annually from *Mycobacterium tuberculosis* infection. BCG is the only available vaccine which is only 0-80% effective. Development of vaccine against mycobacteria is challenging and several experimental vaccine candidates did not demonstrate sufficient efficacy in clinical trials. Early secreted antigenic target 6-kDa (ESAT-6) has been suggested to be an important antigen for protective immunity and BCG lacks ESAT-6. In this study, we aimed to examine the immune responses generated upon immunization with lipopeptides of ESAT-6 and their protective efficacy in a mouse model of *Mycobacterium tuberculosis* infection. Our results demonstrated that intranasal immunization with lipopeptides of ESAT-6 antigen is capable of stimulating potent and multifunctional antigen specific T-cell responses in spleen and lead to substantial infiltration of immune cells in the Bronchio Alveolar Lavage (BAL). Subcutaneous immunization also induced immune responses in spleen comparable to that obtained from intranasal route but failed to recruit immune cells in the BAL. Pre-immunization of mice with lipopeptides of ESAT-6 intranasally led to a significant reduction in *Mycobacterium tuberculosis* (H37Ra) loads in lungs, liver and spleen compared to subcutaneous vaccination. Our study revealed the potential of lipidated peptides of ESAT-6 antigen as a promising mucosal vaccine against tuberculosis.

Biography

Nancy Gupta completed her PhD and is working in Laboratory Medicine and Pathology under Dr. Rakesh Kumar, Dr. Dennis Kunitomo, University of Alberta Edmonton, Canada.

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