

NII scientists identify a possible target for TB

A new study by the Department of Biotechnology's National Institute of Immunology (DBT-NII), New Delhi, has found that a protein called ClpB in *Mycobacterium tuberculosis (Mtb)*, the causative agent of tuberculosis, could be playing an important role in its pathogenesis and therefore could be a target for therapeutic interventions.

The study analysed the role of ClpB in stress adaptation by *Mycobacterium tuberculosis (Mtb)*. Some of the major stresses that the pathogen faces inside the host macrophages - heat stress, hypoxia, starvation, and reactive oxygen intermediates (ROI) - were mimicked *in vitro* and the consequences of deletion of gene encoding ClpB was evaluated on the survival and virulence of mycobacteria.

Stress proteins are known to act as potent immunogens, and to induce a strong and specific immune response in humans and rodents in a number of diseases. In the light of this, the involvement of *Mtb* ClpB protein in generating an immune response in macrophages was also studied. The study demonstrates that ClpB is a key player in conferring stress tolerance to *Mtb* and is also involved in regulating its virulence.

Besides, the study found that ClpB, apart from localizing in the cytosol, is secreted in the extracellular environment, and it interacts with host macrophages. Surface exposed ClpB, thus, mediates inflammatory immune response which may help in maintaining the integrity of tuberculous granulomas that contain the pathogen.

The study thus shows that ClpB functions as an essential stress regulator for *Mtb* as it aids the pathogen in adapting to numerous stressful conditions and imparts it survival advantage in latency-like conditions. Additionally, ClpB appears to act as a signalling molecule which could be playing an important role in the pathogenesis of tuberculosis, and therefore could be a target for therapeutic interventions.

Contact Person & Contact Details:

Dr. J. K. Batra; Email Address: - janendra@nii.ac.in