

How mycobacteria modulate immune responses in host

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One third of the world's population is infected by *Mycobacterium tuberculosis*, the causative agent of tuberculosis (TB), yet only few develop into active disease. This is due to the ability of this bacterium to be latent in its host by altering the immune response by its cell wall components, Lipoarabinomannan (LAM) and lipomannan (LM). During an infection, these complex molecules are recognized by Toll-like receptors (TLRs), however, little is known about the functional outcomes of such interactions. A detailed structural/functional study requires structural variants of these lipoglycans, however, limitation in generating *M. tuberculosis* mutants with variant molecules is restricting such studies. In this regard, *Corynebacterium glutamicum* represents an attractive model, as it has been demonstrated to tolerate mutations in essential cell wall components. Using a genetically engineered *C. glutamicum*, we purified a hypermannosylated form of LM, hLM, and compared its structural/functional immunological activity to that of the wild-type LAM. Interestingly, the extent of arabinan branching modulated the innate immune response via TLR2, with a previously unknown impact on T helper cell differentiation. Our data sheds further light on modulation of innate and acquired immune responses through the modulation of the interaction of TLR2 with specific chemical entities. Furthermore, our study supports the potential of specific lipoglycan structures as novel vaccine adjuvants against TB.

Biography

Arun has a B. Tech in Biotechnology from GGSIP University and a M.S. (Research) from IIT Delhi, India with a DAAD scholarship from TU Berlin, Germany. Following his Masters, Arun was awarded a Darwin trust PhD fellowship from University of Birmingham and at present is a post-doctoral research fellow at the same place. Arun has 13 publications to his credit in international journals and has several awards and credentials to his name. He is also a registered consultant at UNESCO roster and recently been appointed as a consultant on a drug-resistant project at University of Minho, Portugal.

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