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# Cell wall-associated *Mycobacterium tuberculosis rRv3083* protein stimulates macrophages through toll-like receptor-2 (TLR2)

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*Aims and objectives:* Characterization of proteins associated with the mycobacterial cell wall is critical to understanding bacterial survival and immune modulation in the host. A variety of mycobacterial products are able to recognize and activate mammalian toll-like receptors (TLRs) mediating the secretion of antibacterial effector molecules. *Mycobacterium tuberculosis MymA Rv3083* protein is a cell wall-associated protein which is up-regulated upon infection of macrophages. The objective of the present study is to understand the role of *Rv3083* protein as a TLR agonist and its contribution in activating macrophages.

*Methods:* The *MymA (Rv3083)* gene was cloned and expressed. The purified 55.5 kDa recombinant protein was used to stimulate phorbol myristate acetate (PMA) differentiated THP-1 macrophage cell line. Cell surface markers of *Rv3083* stimulated THP-1 cells were done using flow cytometry for TLR2, TLR4, HLA-DR and co-stimulatory molecules CD40, CD64 and CD80. Cytokines TNF-α, IL-10 and IL-12 were assayed in the culture supernatant using ELISA.

*Results:* Stimulation of THP-1 macrophages for 48 and 72 h with *rRv3083* protein resulted in significantly increased expression of TLR2. A significant up-regulation was also seen in the expression of co-stimulatory molecules CD40, CD80 and antigen-presenting molecule HLA-DR on THP-1 cells. These macrophages also produced a significant quantity of proinflammatory $T_{H1}$ cytokines TNF-α and IL-12, but not IL-10 at 48 and 72 h post-stimulation.

*Conclusion:* The cell wall-associated *M. tuberculosis rRv3083* protein acts as an agonist of TLR2 and thereby activates macrophages to produce a $T_{H1}$ immune response.

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