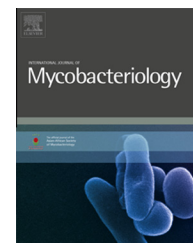


HOSTED BY

Available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IJMYCO

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



Iti Saraav, Swati Singh, Kirti Pandey, Ekta Vishnoi, Monika Sharma, Sadhna Sharma *

D.S. Kothari Centre for Research and Innovation in Science Education, Department of Zoology, Miranda House, University of Delhi, Delhi, India

ARTICLE INFO

Article history:

Received 21 June 2014

Accepted 25 June 2014

Available online 22 July 2014

Keywords:

M. tuberculosis

Rv3083

MymA

Toll-like receptors

T_{H1} immune response

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.

Acknowledgements: The financial support of OSDD-CSIR and the research fellowships of ICMR to I. Saraav and S. Singh is duly acknowledged.

© 2014 Asian-African Society for Mycobacteriology. Published by Elsevier Ltd. All rights reserved.

* Corresponding author. Address: D.S. Kothari Centre for Research and Innovation in Science Education, Department of Zoology, Miranda House, University of Delhi, Delhi 110007, India. Tel.: +91 9711019076.

E-mail addresses: sadhnas@rediffmail.com, rai.sadhna@gmail.com (S.Sharma).

<http://dx.doi.org/10.1016/j.ijmyco.2014.06.006>

2212-5531/© 2014 Asian-African Society for Mycobacteriology. Published by Elsevier Ltd. All rights reserved.