

3rd International Congress on

Bacteriology and Infectious Diseases

August 04-06, 2015 Valencia, Spain

Immune responses to *Mycobacterium avium* infection and the role of MAPK pathway in regulation of signal transduction during the infection

Mohammed Shukur, Sabine Töttemeyer, Nawzat Issa, Paul Barrow and Michael A Jones
University of Nottingham, United Kingdom

Mycobacterial infection is a major problem in both human and animal health. Several cell signaling pathways are involved in the mediation of expression of a number of cytokines induced by mycobacterial infection. The mitogen activated protein kinase (MAPK) pathway plays a crucial role in the pathogenesis of mycobacterial infection. In this study we aimed to evaluate the role of ERK and p38 MAPK in cellular regulation by *Mycobacterium avium* infection in human and chicken macrophages-like cells. THP-1 and HD11 cells were infected with eight clinical isolates of *Mycobacterium avium*. The cells were pre-treated with highly specific inhibitors of the ERK (PD98059 or U0126) and p38 (SB203580) pathways 30 min prior to infection and the levels of cytokine production at 6 and 24 hour post infection were assessed using ELISA and RT-qPCR. *M. avium* infection resulted in differential expression of cytokines and chemokines in THP-1 and HD11 cells. Treatment of the cells with PD98059 or U0126 inhibited production of cytokines in THP-1 and completely blocked their expression in HD11 cells. In addition, p38 inhibition differentially modulated cytokine production in THP-1 cells compared to non-inhibited *M. avium*-infected cells. It inhibited release of IL-6 while the level of IL-1 β and TNF- α showed an increase in THP-1 cells in response to *M. avium* infection following treatment of the cells with SB203580. The results suggest that signalling events are significantly different in avian and human cells following *M. avium* infection. Both p38 and ERK are involved in regulation of IL-6 production while p38 negatively regulates IL-1 β and TNF- α production in response to *M. avium* in THP-1 cells. In HD11 cells, it is suggested that multiple signal pathways simultaneously participate in regulation of cytokine signal transduction during *M. avium* infection.

Biography

Mohammed Shukur is currently a PhD student in School of Veterinary Medicine and Science, University of Nottingham, UK. He has completed his MSc from School of Veterinary Medicine University of Duhok, Iraq.

svxms@nottingham.ac.uk

Notes: