Role of pattern recognition receptors in 
Mycobacterium tuberculosis infection

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Introduction: Tuberculosis (TB) is considered a major worldwide health problem with 10 million new cases diagnosed each year. The present understanding of TB immunology has become greater and more refined since the identification of Mycobacterium tuberculosis (MTB) as an etiologic agent of disease and the recognition of new signaling pathways modulating infection. Understanding the mechanisms through which the cells of the immune system recognize MTB can be an important step in designing novel therapeutic approaches, as well as improving the limited success of current vaccination strategies. A great challenge in chronic disease is to understand the complexities, mechanisms and consequences of host interactions with pathogens. Innate immune reactions, along with the involvement of distinct inflammatory cytokines and cells, have been shown to play an important role in the host defense against MTB. Several classes of pattern recognition receptors (PRRs) are involved in the recognition of MTB, including Toll-Like Receptors (TLRs), C-type lectin receptors (CLRs) and Nod-like receptors (NLRs) linked to inflammasome activation. Among the TLR family, TLR1, TLR2, TLR4 and TLR9 and their downstream proteins play critical roles in the initiation of the immune response in the pathogenesis of MTB.

Materials and Results: In this study, the expression of TLR 2 and 4 was tested in PBMC from a TB patient’s blood by staining cells for flow cytometry. The results showed that infection with MTB causes up-regulation of TLR2 and 4, but not TLR8.

Conclusions: Understanding cross-talk between these signaling pathways in the pathophysiology of TB has an impact in designing novel strategies and in the development of vaccinations and immunotherapy regimes for this disease. Defects in TLR signaling pathways regulated by TB may affect the pathogenesis of MTB and need to be elucidated in future studies.

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