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Original Mycobacterial Sin, a consequence of highly homologous antigens?

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Highlights

- Nature of NTM-The ability of an NTM to be isolated within tissues and genetic/antigenic relatedness to MTBC determines the occurrence of phenomenon of Original Antigenic Sin.
- Persistent exposure to certain types of NTM may result in Original Antigenic Sin, whilst to others, a mild ineffective immune response, which may not have any marked effect on vaccination or diagnostics.

Abstract

The role of antigens shared between Mycobacteria in *in-vivo* cross-reactive immune responses in host animals, have been reported to be responsible for reduced BCG vaccination efficacy as well reduced specificity of routine immunological diagnostic tests. This presents with significant disease control challenges in humans and animals. The present review highlights the results of previous studies on the effect of pre-sensitization to environmental mycobacteria on either pathogenic mycobacteria and/or *M. bovis* BCG, in experimental animals. It also takes an in-depth view into assessing the genetic similarities and relationships between atypical mycobacteria and *Mycobacterium tuberculosis* complex (MTBC) and how they might explain the immunological imprint of environmental mycobacteria in directing the hosts' immune response upon subsequent exposure to other classes of mycobacteria. The outcome of this review suggests that genetic closeness between particular atypical mycobacteria and MTBC usually indicate a higher level of homology for certain shared protective antigens. This ultimately results in a higher level of cross reactive immune responses as compared with other atypical mycobacteria that are further away genetically. This would explain the different effects of environmental mycobacteria on MTBC that have been reported in the different studies. In

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