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Title:	Targeting dendritic cells with TLR-2 ligand-coated nanoparticles loaded with Mycobacterium tuberculosis epitope induce antituberculosis immunity
Authors:	Sehrawat, Sharvan (/jspui/browse?type=author&value=Sehrawat%2C+Sharvan)
Keywords:	Mycobacterium tuberculosis epitope Targeting dendritic cells with TLR-2 ligand-coated nanoparticles loaded
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Abstract:	<p>Novel vaccination strategies are crucial to efficiently control tuberculosis, as proposed by the World Health Organization under its flagship program "End TB Strategy." However, the emergence of drug-resistant strains of Mycobacterium tuberculosis (Mtb), particularly in those coinfecting with HIV-AIDS, constitutes a major impediment to achieving this goal. We report here a novel vaccination strategy that involves synthesizing a formulation of an immunodominant peptide derived from the Acr1 protein of Mtb. This nanoformulation in addition displayed on the surface a toll-like receptor-2 ligand to offer to target dendritic cells (DCs). Our results showed an efficient uptake of such a concoction by DCs in a predominantly toll-like receptor-2-dependent pathway. These DCs produced elevated levels of nitric oxide, proinflammatory cytokines interleukin-6, interleukin-12, and tumor necrosis factor-α, and upregulated the surface expression of major histocompatibility complex class II molecules as well as costimulatory molecules such as CD80 and CD86. Animals injected with such a vaccine mounted a significantly higher response of effector and memory Th1 cells and Th17 cells. Furthermore, we noticed a reduction in the bacterial load in the lungs of animals challenged with aerosolized live Mtb. Therefore, our findings indicated that the described vaccine triggered protective anti-Mtb immunity to control the tuberculosis infection.</p>
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