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A Toll-like Receptor-2 Directed Fusion Protein Vaccine Against Tuberculosis

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Inventor Information
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Disease caused by Mycobacterium tuberculosis remains as a global epidemic, with 8 million new cases each year, and 2-3 million deaths. Although new vaccines are urgently needed, it is important that their manufacture be relatively inexpensive. Researchers at Colorado State University have developed a novel vaccination strategy employing fusion proteins containing a Toll-like Receptor-2 agonist fused to ESAT-6, a well-characterized immunogenic protein from *M. tuberculosis*. This natural adjuvant-containing system could be applied to many mycobacterial proteins, and provide effective, cheap new vaccine candidates against tuberculosis.

Fusion proteins have certain attractions in terms of manufacturing and quality control. One fusion protein, CSU-F36, strongly induced IL-12 secretion from macrophages, and induced both CD4 and CD8 T cellscapable of secreting interferon gamma [IFNγ] in vaccinated mice. These mice were significantly protected from low dose aerosol challenge with *M. tuberculosis,* even with CSU-F36 delivered in a simple depot. Interestingly, CSU-F36 gave similar results when formulated with only DDA (dimethyldioctadecylammonium bromide), a very inexpensive material which could decrease vaccine cost.

Features and Benefits

- Novel vaccination strategy employing TLR-2 agonists fused to immunogenic protein
- Offers widespread applicability and low cost
- Proven efficacy in murine and guinea pig studies

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