Engineering a Dual-Action TB Vaccine: MTB fusion protein after glycosylation with LAM mimetic oligosaccharides

P-31-033

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Tuberculosis (TB) is a transmissible disease caused by *Mycobacterium tuberculosis* and it is the second leading cause of death from a single infectious agent. It is estimated that approximately 10 million people develop TB each year; in 2022 about 1.4 million people died from TB worldwide. TB is a serious public health concern and new effective vaccines are needed. In our previous work, oligosaccharides derived from arabinomannan (AM) have been created and conjugated with recombinant Human Serum Albumin (rHSA) 'Previously published in: Z. Li et al. (2020) Eur J Med Chem 204:112578'. rHSA was glycosylated with AraMan-IME and Ara3Man-IME. Bio-panning experiments revealed that patients with active tuberculosis exhibited a higher antibody response to Ara3Man, a sugar found in lipoarabinomannan (LAM), which is a major component of the mycobacterial cell wall. In this way, through ELISA assays and bio-panning experiments, we have been able to demonstrate the importance of the Ara3Man as an immunodominant epitope in LAM and support its role in eliciting protective immunity against tuberculosis 'Previously published in: Bernardini et al. (2024) Biol Direct 19:11'. These works aim to develop, produce, and evaluate a series of subunit vaccines from chimeric fusion proteins from Mycobacterium tuberculosis (rTB10.4 and rAg85B).

This work is part of the Immuno-HUB Project (Immunoterapia: cura e prevenzione di malattie infettive e tumorali, project number T4-CN-02) supported by the Italian Ministry of Health.