Docket #: S24-176

Tuberculosis epitope targets for vaccine development

Stanford scientists have identified tuberculosis (TB) epitopes preferentially recognized by T cells in patients who naturally resist or control TB infection. Targeting these epitopes for vaccine development could lead to effective vaccines for TB.

TB is a significant global health problem that has been worsening in recent years with 1.6 million deaths in 2021. Despite the high mortality caused by TB, many individuals that test positive for TB have no symptoms and do not spread the bacteria to others. These patients have a latent TB infection and their immune system were able to successfully control the TB infection. Additionally, some patients have had significant exposure to TB and are not only asymptomatic but also test negative for a TB infection. This suggests that these individuals remain uninfected or rapidly clear their infection early on following exposure. The adaptive immune systems of these patients have likely targeted a TB epitope which is highly effective and ideal antigen candidates for vaccine design.

A TB epitope that is recognized by CD4 T cells in patients that are naturally resistant to TB has been identified. Importantly, an improved antigen discovery library is expected to identify additional targets which could be highly relevant for TB vaccine design.

Stage of Development:

- Research:

  in vitro

- Continued research: *in vitro* validations of the T cell phenotype that recognizes the TB epitope; screening for additional TB epitopes.

Applications

- Development of vaccines against TB
- Increasing vaccine efficacy against TB

Advantages

- Epitopes that are preferentially targeted by individuals resistant to TB infections
- Identification of several epitopes for vaccine design

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