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NIH to accelerate progress in TB vaccine development

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NIH awards contracts to advance tuberculosis immunology research

The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, has awarded $30 million in first-year funding to establish new centers for immunology research to accelerate progress in tuberculosis (TB) vaccine development.

New and improved TB vaccines are badly needed. Over the past 200 years, TB has claimed the lives of more than 1 billion people—more deaths than from malaria, influenza, smallpox, HIV/AIDS, cholera and plague combined. TB is the world's leading infectious cause of death and remains a major global health concern. TB is caused by the bacterium *Mycobacterium tuberculosis* (*Mtb*), which spreads from person to person through airborne transmission. Nearly one-quarter of the world's population has latent *Mtb* infection, meaning they carry the bacteria in an inactive form but are not ill and do not transmit *Mtb* to others. People with latent TB have a 5 to 10% lifetime risk of developing active TB disease. The probability of developing active TB is considerably higher in those who are immunocompromised.

The new contract awards establish and provide up to seven years of support for three Immune Mechanisms of Protection Against *Mycobacterium tuberculosis* (IMPAc-TB) Centers to elucidate the immune responses needed to protect against *Mtb* infection. A better understanding of TB immunology is critical to guide the design and development of new and improved TB vaccines, and aligns with the goals of the NIAID Strategic Plan for Tuberculosis Research. Existing BCG vaccines provide some protection to infants and young children against disseminated TB disease, in which the infection has spread to multiple organs. However, these vaccines do not prevent lung infections or provide long-term protection against *Mtb* infection.

The IMPAc-TB program aims to develop a comprehensive understanding of the immune responses required to prevent initial infection with *Mtb*, establishment of latent infection, and transition to active TB disease. To accomplish these objectives, multi-disciplinary research teams will analyze immune responses against *Mtb*, as well as immune responses elicited by promising vaccine candidates, in animal models and humans. Other aims of the IMPAc-TB program include understanding the effects of co-infections such as HIV on immune responses to *Mtb* infection or TB vaccination and improving the value of animal models in predicting *Mtb* vaccine efficacy in humans.

The following three institutions were awarded the new contracts:

Harvard T.H. Chan School of Public Health, Boston
Principal investigators: Sarah Fortune, M.D. (Harvard); Henry Boom, M.D. (Case Western Reserve University, Cleveland); JoAnne Flynn, Ph.D. (University of Pittsburgh)

Infectious Disease Research Institute (IDRI), Seattle
Principal investigator: Rhea Coler, Ph.D.

Seattle Children's Hospital
Principal investigator: Kevin Urdahl, M.D., Ph.D.