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Experimental vaccine elicits robust response against both HIV and tuberculosis

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Clinician researchers in China have developed a vaccine that acts simultaneously against HIV-1 and M. tuberculosis (Mtb). An estimated 14 million people worldwide are coinfected with the two pathogens. The research is published in the May 2012 issue of *Clinical and Vaccine Immunology*.

The vaccine is composed of antigens from both pathogens. The team, led by Sidong Xiong of Fudan University, Shanghai, incorporated four Mtb epitopes (the part of an antigen that is recognized by the immune system) into a backbone composed of HIV-1 p24 protein, a protein that is known to produce protective immunity against HIV-1. The logic of this construction: many epitopes are short peptides, with poor immunogenicity unless they are introduced into a carrier protein—which in this case was the p24 protein.

The vaccine induced cellular immune responses to both pathogens, in which immune system cells including macrophages search out and destroy pathogens; and humoral immune response against HIV-1, in which the immune system produces antibodies against the pathogen. The vaccine was tested in a mouse model.

Tuberculosis is one of the leading causes of death worldwide; third, after hepatitis C and then HIV/AIDS among infectious diseases, according to the World Health Organization (WHO). An estimated 2 billion—28 percent of the world's population—are infected with M. tuberculosis, but most of these infections are latent. However, HIV infection is the

strongest risk factor for the progression of latent tuberculosis infection to active TB. And TB is the direct cause of death in about one quarter of all deaths among people with HIV/AIDS, according to the WHO.

More information: X. Li, W. Xu, and S. Xiong, 2012. A novel tuberculosis DNA vaccine in an HIV-1 p24 protein backbone confers protection against Mycobacterium tuberculosis and simultaneously elicits robust humoral and cellular responses to HIV-1. Clin. Vac. Immunol. 19:723-730.

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