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## Journal club

### A new tuberculosis vaccine

The BCG vaccine, designed as a prophylactic vaccine for pre-infection administration, is currently the only tuberculosis vaccine approved for human use.

In this study researchers developed a new multistage tuberculosis vaccine (H56) which can be used before and after exposure, and tested it in a mouse model. To construct the H56 vaccine, the authors purified the recombinant fusion protein (Ag85B-ESAT6-Rv2660c) from *Escherichia coli*. They hypothesised that it is possible to selectively target *Mycobacterium tuberculosis* (Mtb) in the persistent stage of infection by combining early protective antigens such as Ag85B and ESAT-6 (the H1 vaccine) with the latency protein Rv2660c which is involved in stress responses and characterises long-term Mtb adaptation in the immune host.

The authors assessed the effectiveness of H56, H1 and BCG vaccines administered in mice 6 weeks before Mtb exposure. They demonstrated a statistically significant reduction in bacterial load and induction of immune response with the H56 vaccination compared to the H1 and BCG vaccines starting from 12 weeks after the introduction of infection. The H56 vaccine also enhanced the immunological reaction when administered to mice with earlier treated tuberculosis infection as well as improving response in previously BCG-vaccinated mice later exposed to Mtb.

The new vaccine induces vaccine-specific polyfunctional CD4<sup>+</sup> T cells providing efficient containment of early- and late-stage infection in addition to protection against disease reactivation. This emergence of a novel tuberculosis vaccine in mouse models is an important step forward to guide studies in humans.

► **Aagaard C**, Hoang T, Dietrich J, *et al.* A multistage tuberculosis vaccine that confers efficient protection before and after exposure. *Nat Med* 2011;**17**:189–94.

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Published Online First 30 March 2011

*Thorax* 2011;**66**:976. doi:10.1136/thoraxjnl-2011-200113