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## Modified BCG vaccine strengthens protection against TB

Researchers from the Centenary Institute and the University of Sydney have developed a modified version of the tuberculosis (TB) vaccine BCG that provided stronger and more sustained protection against TB. In preclinical tests in mice, the modified vaccine showed potential as a new approach to improving the effectiveness of TB vaccination.

A bacterial infection caused by *Mycobacterium tuberculosis*, TB remains a major global health challenge, responsible for around 1.2 million deaths globally each year.

BCG is currently the only available vaccine against TB but its effectiveness varies. It provides protection against severe forms of TB in infants and young children but offers only limited protection for adults.

The study, published in *Vaccine*, found that modifying BCG to better target key immune cells improved the immune response generated by vaccination and provided longer-lasting protection against TB.

The researchers focused on dendritic cells, specialised immune cells that help the body recognise potential threats and activate other immune cells. They also play an important role in activating T cells, which help the body fight infections by coordinating the immune response.

In their research, the team genetically modified BCG to produce an antibody fragment that binds to DEC-205, a receptor found on the surface of dendritic cells, improving the interaction between BCG and these important immune cells.

“Our experiments showed that the modified BCG was taken up more effectively by dendritic cells and stimulated greater immune activity, including a stronger response from T cells, with more T cells producing multiple immune signalling molecules,” said lead study author, Dr Claudio COUNOUPAS from the Centenary Institute’s Centre for Infection and Immunity.

“Importantly, this enhanced immune response was associated with stronger protection against TB in the lungs, which was maintained for longer than the protection provided by standard BCG in our experimental model.”

The researchers say the findings provide a strong basis for further investigation into ways of improving BCG and developing more effective TB vaccines.

“BCG has been used for more than 100 years but there remains a need for new vaccines that can provide stronger and more sustained protection against TB,” said study senior author Professor Jamie TRICCAS from the University of Sydney.

“Our findings show that targeting BCG to dendritic cells can improve its protective efficacy in this preclinical model. While these findings are encouraging, we need to better understand whether this approach could ultimately translate into improved protection against TB in people.”

The researchers’ work to further optimise the modified BCG vaccine is ongoing.

[ENDS]

**Publication:**

Targeted delivery of the BCG vaccine to dendritic cells improves protective efficacy against *Mycobacterium tuberculosis*.

<https://www.sciencedirect.com/science/article/pii/S0264410X26005621>

**Images:**

Dr Claudio Counoupas:

<https://drive.google.com/file/d/1P7NKjbwPYZu0JKcE3vBeWOuBy-cySXfN/view?usp=sharing>

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