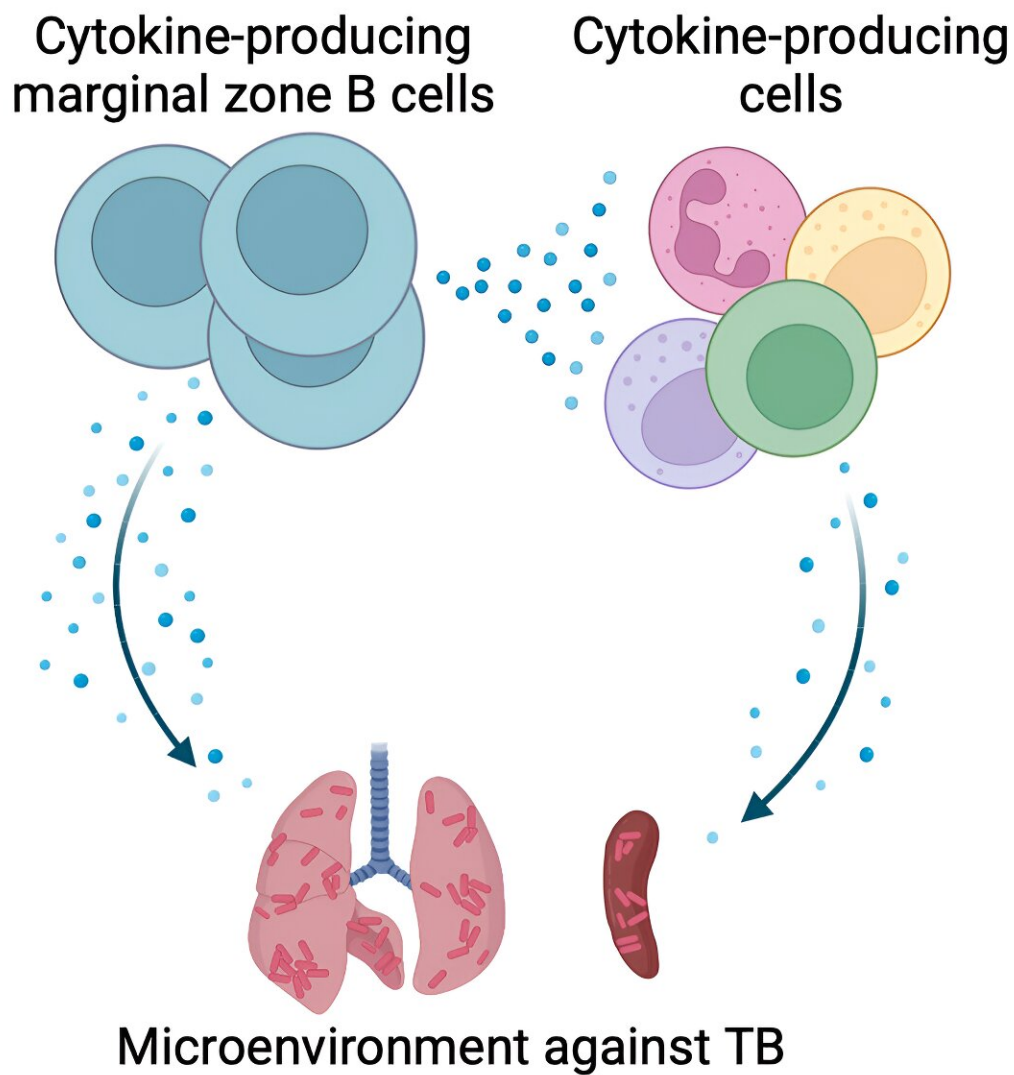


# Scientists identify 'unconventional' new pathway for TB vaccines

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Graphical abstract. Credit: *Cell Reports* (2024). DOI: 10.1016/j.celrep.2024.114426

An "unconventional" immune response now identified by scientists from the Hackensack Meridian Center for Discovery and Innovation (CDI) is a potential new pathway for developing new vaccines for tuberculosis (TB), according to a new publication.

Marginal zone B (MZB) cells are a natural response to TB infection which has been long overlooked—and which might be a welcome new target that could be bolstered through new vaccines to better combat and prevent the disease, [according to the new publication](#) in the journal *Cell Reports*.

"Our results indicate that B cells skew their immune landscape toward MZB cells to execute regulatory functions against TB, emphasizing the importance of antibody-independent mechanisms of B cells for controlling infectious disease, a previously neglected mechanism," write the authors.

Using high-dimensional flow cytometry, the team mapped the progress of infection in an [animal model](#). They showed that B cells shifted their immune landscape toward the MZB cells.

Through detailed tracking of this shift, the MZB cells showed higher activity and memory-like phenotype expression in response to the infection. In turn, that shaped cytokine patterns and then boosted cell-mediated immunity.

"This discovery opens a new avenue in TB [vaccine development](#), suggesting that targeting B cells for their regulatory functions could be a

promising new strategy," the authors add.

The paper's authors were led by CDI scientists: Chen-Yu Tsai Ph.D., Ariel Aptekmann, Ph.D. Thomas Dick, Ph.D. and Martin Gengenbacher, Ph.D.

Gengenbacher has studied the Mycobacteria genus of bacteria, including tuberculosis, for most of his career. Since the only TB vaccine available, Bacille Calmette-Guérin, or BCG, is very unreliable, Gengenbacher and team have proposed to improve BCG by engineering it to stimulate the development and communication of B cells, an important part of the immune system.

With this strategy, the researchers are aiming to develop a second-generation TB [vaccine](#) that would provide reliable and durable protection from new infections and can even help to cure existing TB infections by complementing antibiotic therapy.

**More information:** Chen-Yu Tsai et al, Splenic marginal zone B cells restrict Mycobacterium tuberculosis infection by shaping the cytokine pattern and cell-mediated immunity, *Cell Reports* (2024). [DOI: 10.1016/j.celrep.2024.114426](#)

Provided by Hackensack Meridian Health

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