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Novel Vaccine Formulations for Mycobacterium Tuberculosis and use of Thereof

A novel vaccine strategy utilizing a painless intranasal delivery system enhances the immune response against tuberculosis, offering improved protection for high-risk populations.

Researchers at Purdue University have developed a novel addition to traditional vaccines which includes painless intranasal delivery of an Autophagy Inducing Peptide (AIP) for directly inhibiting the root cause of the tuberculosisâ€”Mtb. Mtb is a leading cause of death worldwide, leading to 1.5 million fatalities annually. Those highly susceptible to (Mtb), expressly at-risk seniors and children, are not completely protected by currently available preventative Bacillus Calmette GuÃ©rin vaccines. Purdue researchers have created a vaccine to allow the body's immune system to fight Mtb antigens using a mycobacterial antigen-85B, for targeting Mtb, with autophagy-inducing peptide, C5 from CFP10 proteins that contribute to virulence of Mtb, that can be expressed by a bovine adenoviral vector (BAd85C5) or a human adenoviral vector (HAd85C5). In testing in mice, the new vaccines were administered along with an intranasal aerosol-based booster. Robust effector (TEM) and central memory (TCM) T cell response was achieved with the Bad85C5 vaccine, and IL-12 expression was observed to monitor effectiveness of C5, validating an enhanced immune response in mice.

Advantages:

-Improves Pediatric Care

-Less Invasive

-Enhanced T Cell Response

Potential Applications:

-Tuberculosis Vaccine

-Vaccine approach for other infectious diseases

Technology ID

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Category

Biotechnology & Life Sciences/Cell & Gene Therapy Platforms

Pharmaceuticals/Drug Delivery & Formulations

Authors

Chinnaswamy Jagannath

Suresh K Mittal

Further information

Clayton Houck

CJHouck@prf.org

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-Cancer Treatments

-Life Science Research

Technology Validation:

The new TB vaccine strategy was tested in mice conferring significant protection from an intranasal Mtb challenge.

TRL: 4

Intellectual Property:

Provisional-Gov. Funding, 2021-03-12, United States | PCT-Gov. Funding, 2022-03-08, WO | NATL-Patent, 2023-09-11, United States | NATL-Patent, N/A, India | NATL-Patent, N/A, European Patent

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