TECHNOLOGY

Novel Tuberculosis Vaccine

OVERVIEW

Tuberculosis (TB) is a highly infectious disease that usually affects the lungs, but it may also affect other organs including glands, brain or even the bones of the body. In 2007 the national TB incidence rate in the United States was 4.4 cases per 100,000 populations. The currently available vaccine for tuberculosis is Bacillus Calmette-Guerin (BCG). It is used in many countries with a high prevalence of TB to prevent childhood tuberculosis meningitis and miliary disease. BCG has been shown to be ineffective for preventing pulmonary TB in adolescents and adults. Moreover BCG is virulent and can be fatal to immune-compromised individuals (like those with AIDS). Hence there is need for a more global and effective vaccine that would help prevent TB in all age groups.

Researchers at the University of Maryland have recently discovered a novel vaccine for tuberculosis. This vaccine is inherently different from the BCG and is considered a safe option to be used in humans. Like many other vaccines this is a weakened form of tuberculosis that will not cause an infection or disease. It is derived from a close relative of TB, Mycobacterium Marinum. The researchers have developed a strain of this bacterium that is effective in generating an immune response. When tested in zebrafish this strain produced an inflammatory response by an unknown mechanism. Mycobacterium marinum has been previously tested in mice in 1975 by Collins et al who showed its efficacy in providing protection against TB in mice.

Advantages
Mycobacterium marinum is closely related to Mycobacterium tuberculosis, the TB causing bacterium. It has an intact ESX-1 (required for virulence and immune response), is restricted at body temperature, and causes only local and mild infection in humans, and hence represents a promising vaccine candidate for TB. This vaccine is considered to be non-virulent and hence will not affect immune-compromised individuals. It is potentially quicker to produce than BCG or other current tuberculosis. It does not require special manufacturing or storage facilities.
Applications
1) Non-virulent alternative to the tuberculosis BCG vaccine.
2) It may be an effective option for preventing pulmonary TB in adolescents and adults.
3) It may help prevent TB in immuno-compromised individuals.

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Additional Information

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LICENSE STATUS

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CATEGORIES

- Vaccines

EXTERNAL RESOURCES

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