

Novel Live Recombinant Booster Vaccine against Tuberculosis

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SUMMARY

Researchers at UCLA have developed a novel vaccination strategy against tuberculosis in humans and animals. The invention also details the generation of a vaccine against leprosy and other mycobacterial diseases in humans and animals.

BACKGROUND

Tuberculosis (TB) infection remains highly prevalent worldwide. The WHO estimates 1.7 million deaths from TB annually. Africa and Southeast Asia have the highest burden of TB mortality. The persistence of TB infection has promoted the emergence of multi- and extensively drug-resistant (M/XDR) strains, which pose an imminent threat to industrialized nations. The vaccine currently used for TB, BCG, has been widely administered but lacks optimal protection. In fact, a large, carefully conducted meta-analysis by Colditz et al. (1994) estimates the potency of BCG protection to be approximately 50%. Therefore, new vaccines or booster strategies are necessary to combat TB infection. Improvements in the potency of TB vaccination will represent a significant advancement in global health and a step towards eradication of TB.

INNOVATION

In an effort to improve the potency of BCG protection, researchers at UCLA developed a novel vaccine vector system for delivery of TB proteins. This system exploits a live, attenuated bacterial vector to deliver immunizing proteins. The novel booster vaccine can be administered after BCG or similar vaccination. In animal models, use of the novel vaccine induced greater protective immunity than either boosting with purified protein in adjuvant or boosting with recombinant viruses containing the same protein.

APPLICATIONS

Vaccination for TB.

ADVANTAGES

- ▶ The new vaccine and strategy are more potent than currently commercially available vaccines in protecting against pulmonary tuberculosis.
- ▶ The bacteria-based booster vaccine invention provides more potent protection against TB infection than protein in adjuvant vaccinations or adenovirus-based vaccines.
- ▶ The bacteria-based vaccine does not require purification from cell culture and is therefore easier and cheaper to manufacture than virus-vectored vaccines.

STATE OF DEVELOPMENT

Researchers have genetically modified the bacterial vaccination vector to optimize the expression of immunoprotective proteins and eliminate any vector-mediated toxicity. In animal studies, administration of the novel booster vaccine induced lymphocyte proliferation and TB protection above BCG alone and above BCG plus a viral-based boost.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,010,595	07/03/2018	2010-657

CONTACT

UCLA Technology Development Group
 ncd@tdg.ucla.edu
 tel: 310.794.0558.



INVENTORS

- ▶ Horwitz, Marcus A.

OTHER INFORMATION

KEYWORDS

Tuberculosis, Vaccines

CATEGORIZED AS

- ▶ Medical
- ▶ Vaccines

RELATED CASES

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UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

tdg.ucla.edu

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

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