



Composition and Methods for Plague Treatment

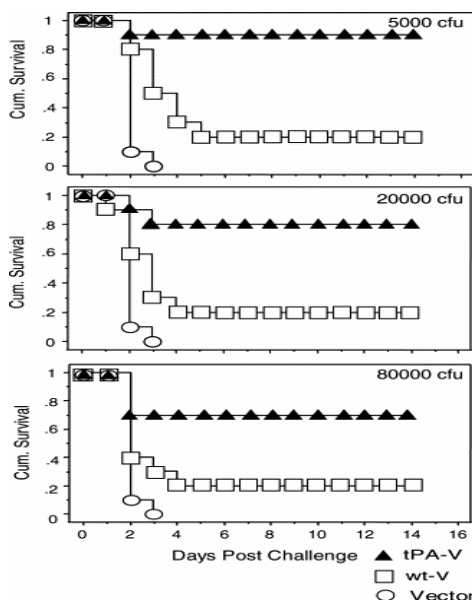
Keywords: *Yersinia pestis*, Bacteria, Plague, Vaccine, Plasmid

Background

Pneumonic plague is a lethal and highly contagious disease caused by the Gram-negative bacterium *Yersinia pestis*. The CDC classifies Plague as a Category A agent, a designation given to diseases believed to pose the greatest threat to public health. Also, the heightened threat perception of Bioterrorism has necessitated the need to develop and maintain vaccines stockpiles against Plague

Technology

Developed by UMass Medical School Professor Dr. Shan Lu and colleagues, the technology is comprised of a novel DNA vaccine expressing a modified V antigen (LcrV) of *Y. pestis*, with a human tissue plasminogen activator (tPA) signal sequence. The vaccine elicited strong V-specific antibody responses in BALB/c mice. In addition, this tPA-V DNA vaccine protected mice from intranasal challenge with lethal doses of *Y. pestis*. In comparison, a DNA vaccine expressing the wild type V antigen was much less effective. Only tPA-V formed oligomers spontaneously, and elicited a higher IgG2a anti-V antibody response in immunized mice, suggesting increased T_H1 type cellular immune response.



Reference: Wang et al. (2004) *Vaccine* 22, 3348

Application

Yersinia Vaccines

Salient Features and Competitive Advantages

- 👍 **Robust and Specific Immune Response:** High level anti-plague antibody and increased T_H1 type cellular immune responses were observed in mice immunized with V or F1 DNA vaccines.
- 👍 **Broad Applicability.** DNA vaccines may be useful in developing vaccines for infectious diseases, novel therapies for cancer, and therapeutic protein delivery,
- 👍 **Safety.** Contain no viral components that may cause unwanted immune responses, infections, or malignant and permanent changes in the targeted cells' genetic makeup,
- 👍 **Repeat Administration.** DNA vaccines contain no viral components that may preclude multiple dosing with a single product or use in multiple products,
- 👍 **Longer Shelf Life.** DNA is more *thermo-stable* compared to *live/attenuated* viral vaccines
- 👍 **Cost-Effectiveness.** DNA will be cheaper to manufacture in a shorter time period as compared to current vaccines.
- 👍 **Market Potential:** The global vaccine market is expected to top \$10 billion this year and \$23.8 billion by 2012.

Business Opportunity

UMass OTM is seeking statements of interest from parties interested in licensing and/or sponsoring collaborative research to further develop, evaluate, or commercialize this technology.

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