TECHNOLOGY

Vaccine for Prevention of Sepsis and Broad Protection Against Gram-Negative Bacterial Infections

OVERVIEW

The “J5dLPS/OMP” vaccine, created by academic and federal research collaborators led by Prof. Alan Cross, is a clinical-stage vaccine for the prevention of sepsis and protection against infection by a wide variety of Gram-negative bacteria. The vaccine comprises detoxified core lipopolysaccharide from Escherichia coli J5 complexed with group B meningococcal outer membrane protein (“J5dLPS/OMP”). Phase 1 clinical trials showed the vaccine to be safe, well tolerated, and immunogenic. This vaccine shows great promise as both a prophylactic and therapeutic approach for control of many types of lethal infections by Gram-negative bacteria.

APPLICATIONS

Sepsis is the leading cause of death in US hospitals (270,000 deaths/yr) and the most costly (> $24B/yr)

o J5dLPS/OMP vaccine provides broad protection against gram-negative bacterial infections (e.g., *Klebsiella, Pseudomonas, Burkholderia, Francisella, Yersinia, Enterobacter, E.coli, Serratia, Actinobacter, Salmonella, Shigella*)

o Vaccine may prevent lethal complications from burn injuries, graft-versus-host disease, etc., and protect against biological warfare agents

o Antibodies raised from vaccine may be used to treat infections and in rapid response to biological warfare

o J5dLPS/OMP vaccine may be used to protect individuals who work in high-risk professions (e.g., military, police, and firefighters)

o Vaccine also demonstrates potential for veterinary applications

STAGE OF DEVELOPMENT

Two Phase 1 clinical trials, with & without CpG adjuvant, have validated the J5dLPS/OMP vaccine as safe, well tolerated, and immunogenic (*Vaccine* 2003 & 2015). The vaccine was effective in the neutropenic rat model of sepsis (eliciting a >200-fold increase in anti–J5 LPS antibody, and improving survival in immunized versus control animals: 61% versus 0% in Pseudomonas- and ceftazdime-treated rats; *J. Inf. Disease* 2001). Challenge studies in animal models demonstrated protection against lethal doses of *F. tularensis* (*Vaccine* 2010) and against lethal gram-negative bacillary pneumonia (*Innate Immunity* 2008). And, when cattle were immunized with the J5dLPS/OMP vaccine, high titers of serum anti-endotoxin antibodies were elicited, and were passed to the cow’s colostrum (*Vaccine* 2014).

LICENSING POTENTIAL

UMB seeks development partner for licensing and/or sponsored research.

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Additional Information

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PATENT STATUS

US CIP 9,616,116, issued 2017

LICENSE STATUS

Available for licensing

CATEGORIES

- Vaccine

INVESTIGATOR(S)

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ATTACHMENTS

- Download UMB Marketing summary AC-2006-005 (updated Apr 2023).pdf

EXTERNAL RESOURCES

- Results of Phase 1 trial with/without CpG adjuvant
- Vaccine protects against pneumonia
- Immunization of cattle

AC-2006-005