



TECHNOLOGY

Strategy for a Broad-Spectrum Vaccine Against Non-Typhoidal Salmonella

OVERVIEW

On screening sub-Saharan African residents over the last decade for signs of invasive bacterial infection, a high incidence of non-typhoidal Salmonella (NTS) infections was discovered, and these cases were associated with antibiotic resistance and a high mortality of 20-30%. The invasive strains of NTS are dominated by Salmonella Typhimurium and Salmonella Enteritidis. In more industrialized countries, NTS causes outbreaks of gastroenteritis (1.4 million cases and 400 deaths in the U.S. annually), such as the illness from contaminated peanut butter in early 2009. These outbreaks are increasing in frequency in the industrialized world and expected to increase in severity, particularly affecting young infants, the elderly, and those who are immunocompromised. To address the NTS disease problem, UMB researchers have developed a multivalent vaccine strategy: (1) a live oral vaccine with specific attenuating mutations; and (2) a conjugate vaccine consisting of bacterial polysaccharide linked to flagella protein from the same strain. The live NTS vaccine strain is also used to produce the conjugate vaccine, and the specific genetic mutations provide manufacturing advantages for enhanced safety and high yields. The researchers are concurrently testing a few candidate vaccine strains that have slightly different mutations. The live and conjugate vaccines were shown to be highly immunogenic and well tolerated in mice. In studies challenging mice with a lethal dose of NTS pathogen, the vaccinated mice were protected versus controls. What may provide the best overall protection is to administer a priming dose of live vaccine followed by a boost with the conjugate vaccine.

APPLICATIONS

Vaccinating children under 5 years old in the developing world
Vaccinating the at-risk population in the industrialized world, including the elderly

ADVANTAGES

FIRST VACCINE OF ITS KIND, as no licensed NTS vaccine currently exists

STAGE OF DEVELOPMENT

Preclinical studies demonstrate vaccine strains are highly immunogenic and well tolerated and, importantly, protect mice from a lethal challenge with NTS pathogen. Studies continue on the conjugate vaccine to determine its optimal composition.

R&D REQUIRED

Further preclinical studies, with optimization of vaccine strategy, followed by clinical development.

LICENSING POTENTIAL

UMB seeks commercialization partner to help advance this technology into the clinic.

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LICENSE STATUS

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- Therapeutics
- Vaccines

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ATTACHMENTS

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