An Attenuated E.Coli Vaccine for Enterotoxigenic E. Coli (ETEC)

Published date: June 17, 2013

Technology description

Live attenuated vaccine strains expressing protective Enterotoxigenic E. coli (ETEC) antigens.

Background

EnterotoxigenicE. coli(ETEC) is the leading cause of traveler’ s diarrhea in high-risk areas of the world as well as a major cause of diarrheal disease in underdeveloped nations, especially among young children. In fact, in developing nations more than one million cases of diarrheal episodes occur annually, and nearly 800,000 children under the age of 5 die each year from ETEC-induced diarrhea. ETEC is transmitted by food and water contaminated with animal or human feces. Once ETEC enters the intestines these bacterial pathogens produce specific toxins which stimulate the lining of the intestines to secrete excess fluid, producing profuse watery diarrhea. The illness caused by ETEC can range from mild diarrhea with little to no dehydration to a very severe and potentially fatal cholera-like disease. Although many people can recover from this infection, ETEC is still responsible for a significant amount of illness worldwide especially among infants. There is a present need for a safe and effective ETEC vaccine that provides a considerable public heath impact worldwide in infants in developing countries, as well as travelers, and for the military.

Technology Description

This novel technology describes the development of live attenuated vaccine strains expressing protective EnterotoxigenicE. coli(ETEC) antigens. The vaccine vector uses an existing attenuated (reduced virulence) attaching and effacingE. colistrain with minimal immunogenicity (ability to form an immunological reaction). Immunized animals are further protected against lethal and non-lethal challenges with the enterotoxigenicE. colistrain. Immunization of mice with the vaccine construct induces mucosal antibody against both antigens, establishing the attenuatedE. colivector strain as a generally useful vector for presenting one or more antigens to a subject in a vaccine.

Application area

Applications in developing countries, for infants, travelers and the military

Our vaccine platform should also protect against the development of hemorrhagic colitis or hemolytic uremic syndrome.

Advantages

Based on a novel live, fully attenuated E. coli vaccine strain of one of the most prevalent families of ETEC
The immunogenicity of these live E. coli strains are expected to be higher than alternative killed E. coli strains and microencapsulated antigens currently being developed
Since these vaccines are based on adherent but non-invasive pathogens, it is expected that they will be much better tolerated than multivalent live vaccines derived from invasive strains

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