Citrobacter freundii WR7011 as a Vaccine Strain or Source of Vi Capsular Antigen for Protection Against Typhoid Fever

Technology Summary

According to the WHO, typhoid fever remains a serious public health problem throughout the world, with an estimated 16-33 million cases and 500,000 to 600,000 deaths annually. The Vi capsule of S. typhi, the causative agent of typhoid fever, is a surface-bound carbohydrate polymer targeted by antibodies to protect against typhoid fever. Purification of this polymer from virulent S. typhi strains poses a danger to those handling the live organism.

Available to license through FDA, a unique strain of Citrobacter freundii, WR7004, was mutated by FDA inventors to create the strain (WR7011) that expresses Vi polysaccharide on its surface. C. freundii WR7011 expresses several times as much Vi polysaccharide as native strains of S. typhi, is nonpathogenic, and is much safer to work with for Vi production or as a vaccine strain. The strain specifically was mutated using nitrosoguanidine. This strain of C. freundii can reduce the cost of purifying the Vi polysaccharide and provide a safe method of manufacturing the polysaccharide.

Potential Commercial Applications

- Synthesis of S. typhi Vi polysaccharide

Competitive Advantages

- WR7011 is a safe, non-toxic strain of Citrobacter freundii
- Efficient, low cost, production of S. Typhi vaccine polysaccharide (Vi)

Inventors: Dennis Kopecko, De Qi Xu

Publications:


Intellectual Property:

- Research Tool – no patent protection was pursued for this technology

Product Area: typhoid fever, vaccine, conjugated vaccine, polysaccharide

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