

Breast Milk as a Source, Incubation/Storage Medium, and Delivery System for Infant Mucosal Immunity Bacteriophage

Tech ID: 28706 / UC Case 2014-569-0

ABSTRACT

Researchers at the University of California, Davis have developed a method to harvest and enrich symbiotic bacteriophage to promote bacterial immunity.

FULL DESCRIPTION

A human infant's gastrointestinal tract, specifically the mucosal surfaces and the mucus layer found within the gastrointestinal tract, act as major barriers against infection and are ideal environments for symbiotic microbial communities. Bacteriophage populations present in mammalian milk can transmit bacterial immunity from mother to infant. For bacteriophages to reach a critical layer, they must quickly pass through the acidic conditions of the stomach so as to not be destroyed. Infant milk formulas, however, do not have sufficient adherence of bacteriophage to mucus-producing epithelial cells, creating a need for a more reliable and easily incorporated methods of transmission, mucosal attachment, and maintenance of bacteriophage community in an infant's gastrointestinal tract.

Researchers at the University of California, Davis have developed a method to identify, maintain and selectively enrich bacteriophage to transmit bacterial immunity. Bacteriophage populations present in mammalian milk can transmit bacterial immunity from mother to infant. Milk, which is known to contain various glycoconjugates including Milk Fat Globules (MFG) covered in mucins, can act as a delivery system to overcome the conditions of the stomach while also acting as a bioreactor for the selective enrichment of bacteriophages. Milk-derived bacteriophage fed to infants provide a first line of mucosal defense and initiate the development and selection of healthy microbiota. In addition, it can also influence lifelong ecological dynamics of the microbiota and contribute to prophylactic prevention of intestinal pathogens within the gastrointestinal tract. This new method of delivery will help assist bacteriophage transit through the stomach, including the buffering of stomach acids, and improve bacteriophage adherence to MFG and other glycoconjugates.

APPLICATIONS

- ▶ Method to identify, maintain and selectively enrich bacteriophage
- ▶ Transmit bacterial immunity to infant

FEATURES/BENEFITS

- ▶ Selective bacteriophage enrichment
- ▶ Assist bacteriophage transit through the stomach
- ▶ Improves bacteriophage adherence to glycoconjugates

PATENT STATUS

Country	Type	Number	Dated	Case
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INVENTORS

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OTHER INFORMATION

KEYWORDS

milk fat globules, MFG,
 infant, bacteria,
 immunity, bacteriophage,
 GI, gastrointestinal
 tract, milk, mammalian,
 mammal, symbiotic,
 bacterial immunity,
 glycoconjugates

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Nutraceuticals
 - ▶ Other
- ▶ **Materials & Chemicals**
 - ▶ Biological
 - ▶ Medical
 - ▶ Delivery Systems

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► Disease: Digestive
System

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2014-569-0

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