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HYPERVESICULATING GUT MICROBES FOR THE TREATMENT OF CHRONIC GUT CONDITIONS

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T-020706

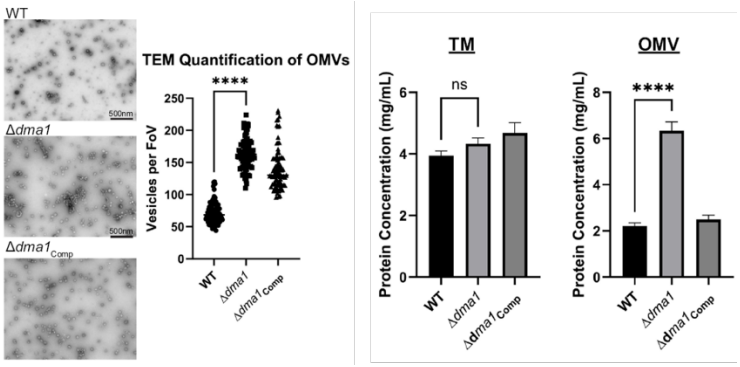
Published Date: 6/3/2025

Value Proposition: *System that employs gut microbe strains engineered with therapeutic enzymes to treat chronic gut conditions.*

Technology Description

Researchers at Washington University in St. Louis have developed a hypervesiculating *Bacteroides theatiotaomicron* (Bt) mutant to treat chronic gut conditions, like lactose intolerance, phenylketonuria, and inflammatory bowel diseases. Currently, there are very few remedies for chronic intestinal conditions, like lactose intolerance. Now, people can take Lactaid, and similar products, to provide an exogenous source of the enzyme lactase that is absent in people with lactose intolerance. However, the effects of this are short-lived, which prevents many from enjoying foods that contain dairy.

This novel system can be used to target beneficial payload to the gut by to colonizing individuals' guts with Bacteroides that produce OMVs containing engineered lactose fusion protein, providing longer-term relief for chronic intestinal conditions and other conditions like inflammatory bowel disease and phenylketonuria.



Left: TEM images from OMVs. OMVs were counted manually using grids. Right: Lowery Protein Assay.

Stage of Research

Proof of concept

Applications

- Treatment of chronic gut conditions

Key Advantages

- OMVs easily fuse with membranes of target cells

- Highly stable and biocompatible
- Uses novel, mutant strain of Bt that could be used to deliver higher concentrations of therapeutic compounds than wild type Bt.
- Long circulation time in the blood
- Can be used for targeted delivery due to naturally loaded biomolecules

Patents

Patent application filed

Related Web Links – Mario Feldman Profile**;** Feldman Lab