

BACTERIAL ENZYMES FOR PRODUCTION OF HUMAN MILK OLIGOSACCHARIDES IN PLANTA

Tech ID: 34780 / UC Case 2026-179-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Mammalian milk oligosaccharides are complex carbohydrates found naturally in milk that provide critical nutritional and immunological benefits to developing infants. Replicating these complex structures historically required expensive and low yield chemical or microbial fermentation processes. To create a more scalable and cost effective production system, UC Berkeley researchers have developed a method to produce mammalian milk oligosaccharides directly within plant tissues. By engineering plants to express recombinant mammalian milk oligosaccharide biosynthetic pathways, the target host plants can successfully synthesize these valuable carbohydrates in planta. This agricultural production strategy uses the natural cellular machinery of plants to manufacture complex sugars at scale, offering a sustainable and highly efficient platform for the production of infant formula additives and therapeutic nutritional supplements.

SUGGESTED USES

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Production of human milk oligosaccharides within agricultural crops for use as nutritional additives in infant formula

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Synthesis of functional carbohydrates in edible plants to create specialized medical foods for pediatric patients

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Scalable manufacturing of complex mammalian sugars for inclusion in dietary supplements aimed at adult gut microbiome health

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Large scale production of specific oligosaccharides for clinical research into immune system modulation and gut barrier functions

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Agricultural cultivation of bioengineered plants to serve as low cost extraction sources for the global food and beverage industry

ADVANTAGES

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Lowers production costs significantly by utilizing simple agricultural cultivation rather than complex industrial bioreactors

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INVENTORS

» [Shih, Patrick M.](#)

OTHER INFORMATION

CATEGORIZED AS

» [Agriculture & Animal Science](#)

» [Nutraceuticals](#)

» [Transgenics](#)

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Leverages existing agricultural harvesting and processing infrastructure to scale up production capacity efficiently

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Eliminates the risk of bacterial endotoxin contamination often associated with traditional microbial fermentation systems

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Utilizes renewable solar energy and atmospheric carbon dioxide via plant photosynthesis to drive carbohydrate synthesis

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Expresses complete biosynthetic pathways inside the plant host to enable the production of diverse and highly structured sugars

RELATED MATERIALS

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