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Alpha1-2-Fucosyltransferase for Enzymatic Synthesis of Alpha1-2-linked Fucosylated Glycans

Tech ID: 27432 / UC Case 2015-838-0

ABSTRACT

Researchers at the University of California, Davis have discovered an alpha1-2-fucosyltransferase that efficiently catalyzes the synthesis of alpha1-2-linked fucosylated glycans that can contain different internal glycans.

FULL DESCRIPTION

Alpha1-2-linked fucosides are important for their potential application in treating inflammation, bacterial and viral infection and cancer. They are also major components of human milk oligosaccharides. Therefore, they are desirable synthetic targets for therapeutic and prebiotic development. The acid lability, however, make the chemical construction of the fucosidic bond difficult. Fucosyltransferase-catalyzed methods that are highly efficient and selective can be an indispensable resource in obtaining biomedically important fucoside-containing glycans and other biomolecules.

Researchers at the University of California, Davis have discovered an alpha1-2-fucosyltransferase that efficiently catalyzes the synthesis of alpha1-2-linked fucosylated glycans containing different internal glycans. With a one-pot multienzyme strategy, Te1-2FT-catalyzed fucosylation reactions were accomplished without needing high-cost sugar nucleotides or isolation of intermediates. Synthesis typically occurs in less than 24 hours, and purification and characterization of the product can be completed in less than 3 days, making this process faster and more efficient than chemical synthetic approaches. Finally, the enzyme reactions can be carried out in aqueous solutions, avoiding toxic organic solvents.

APPLICATIONS

- ▶ Potential target for therapeutic development for treating cancer, bacterial and viral infection, and inflammation
- ▶ Synthesis of important fucosides that play a protective role in human milk for nursing infants

FEATURES/BENEFITS

- ▶ Excellent yields with defined regio- and stereoselectivity
- ▶ Simplified isolation and purification
- ▶ Faster and more efficient than chemical synthetic methods
- ▶ Reactions can be carried out in aqueous solutions
- ▶ Avoids toxic solvents

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,572,548	02/07/2023	2015-838

Additional Patent Pending

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OTHER INFORMATION

KEYWORDS

alpha1-2-
fucosyltransferase,
fucoside, fucosylation,
enzymatic synthesis, one-
pot multienzyme, OPME,
oligosaccharides

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Other
- ▶ **Materials & Chemicals**
 - ▶ Biological
 - ▶ Chemicals
 - ▶ Other
- ▶ **Medical**
 - ▶ Other
 - ▶ Therapeutics
- ▶ **Research Tools**
 - ▶ Other

RELATED CASES

2015-838-0

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- ▶ Stable N-acetylated analogs of Sialic Acids and Sialosides
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- ▶ One-Pot Multienzyme Synthesis of Sialidase Reagents, Probes and Inhibitors
- ▶ Novel Methods For Chemical Synthesis Of Lactosyl Sphingosines, Glucosylsphingosines, Galactosylsphingosines, And 3-O-Sulfogalactosylsphingosines

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