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O-Acetyl Glycosphingosines and Gangliosides, as well as Their N-Acetyl Analogs

Tech ID: 33480 / UC Case 2023-9A5-0

ABSTRACT

Researchers at the University of California, Davis have developed a technology providing the creation of stable analogs of glycosphingosines and gangliosides containing O-acetylated sialic acid for extensive biological and medical applications.

FULL DESCRIPTION

Researchers at the University of California Davis have developed a technology that involves a chemoenzymatic method to produce stable 9-N-, 8-N-, and 7-N-acetyl analogs of glycans and glycoconjugates containing 9-O-acetyl sialic acids (Sias). Sias are common modifiers of glycoconjugates in humans, vertebrates, and pathogenic bacteria and O-acetylated Sias are common but unstable. These groups of Sias, with the help of this technology, can be made stable, overcoming the challenge of their lability and propensity for migration under physiological conditions.

APPLICATIONS

- ▶ Development of targeted cancer immunotherapy.
- ▶ Discovery and development of anti-inflammatory reagents.
- ▶ Elucidation of fundamental mechanisms involving Sia O-acetylation in selected gangliosides.
- ▶ Potential in developing diagnostic and therapeutic approaches for infectious, malignant, neurodegenerative, and immune processes involving these common but poorly understood sialic acid forms.

FEATURES/BENEFITS

- ▶ Produces stable analogs of glycans and glycoconjugates containing O-acetylated sialic acids to make them easier to study.
- ▶ Enhances the strength and/or duration of functional impacts of the corresponding O-acetylated forms.
- ▶ Opens the door to many previously intractable questions related to Sia O-acetylation.
- ▶ Overcomes the instability of O-acetyl groups, allowing for their extensive study and application.
- ▶ Provides tools for the detailed investigation of b-series gangliosides carrying 9-O-acetyl group.
- ▶ Helps to detect potential receptors for these OAc-gangliosides.

PATENT STATUS

Patent Pending

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INVENTORS

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OTHER INFORMATION

KEYWORDS

chemoenzymatic synthesis,
N-acetyl ganglioside
glycosphingosines, N-acetyl
gangliosides, O-acetyl
ganglioside
glycosphingosines, O-
acetyl gangliosides, O-
acetylated sialic acid

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
 - ▶ Other
- ▶ **Medical**
 - ▶ Disease:
Autoimmune and
Inflammation
 - ▶ Disease: Cancer
 - ▶ Disease:
Infectious Diseases
 - ▶ Other

RELATED CASES

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Purification of Glycosphingosines and Glycosphingolipids
- ▶ A Photobacterium Sp. Alpha2-6-Sialytransferase 9Psp2.6St) A366g Mutant With Increased Expression Level And Improved Activity In Sialylating Tn Antigen
- ▶ Synthesis of Capsular Polysaccharides
- ▶ Legionaminic Acid Glycosyltransferases for Chemoenzymatic Synthesis of Glycans and Glycoconjugates
- ▶ Using Escherichia coli to Produce Human Milk Oligosaccharide Lactodifucoetraose
- ▶ 4-N-Derivatized Sialic Acids and Related Sialosides
- ▶ Substrate And Process Engineering For Biocatalytic Synthesis And Facile Purification Of Human Milk Oligosaccharides (HMOs)
- ▶ Stable N-acetylated analogs of Sialic Acids and Sialosides
- ▶ Alpha1-2-Fucosyltransferase for Enzymatic Synthesis of Alpha1-2-linked Fucosylated Glycans
- ▶ Engineering Pasteurella Multocida Heparosan Synthase 2 (Pmhs2) For Efficient Synthesis Of Heparosan Heparin And Heparan Sulfate Oligosaccharides
- ▶ 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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