

# Purification of Glycosphingosines and Glycosphingolipids

Tech ID: 33347 / UC Case 2022-616-0

## CONTACT

Pooja N. Bhayani  
[pnbhayani@ucdavis.edu](mailto:pnbhayani@ucdavis.edu)  
tel: .



## INVENTORS

- ▶ Chen, Xi
- ▶ Yu, Hai
- ▶ Zhang, Libo

## OTHER INFORMATION

### KEYWORDS

glycosyltransferase,  
process engineering,  
chemoenzymatic  
synthesis, ganglioside,  
glycosphingosine,  
glycosphingolipid

### CATEGORIZED AS

- ▶ **Medical**
- ▶ Diagnostics
- ▶ Other
- ▶ Therapeutics

### RELATED CASES

2022-616-0

ABSTRACT

Researchers at the University of California, Davis (UC Davis) have developed a simplified procedure to synthesize complex glycosphingosine compounds for the chemical preparation of glycosphingolipids.

FULL DESCRIPTION

Glycosphingolipids, a sugar-conjugated lipid, are found in the cell membranes of organisms from bacteria to humans and are used in a range of biological processes such as proteinsorting,signaltransduction,membranetrafficking,viral/bacterialinfection, and cell-to-cell communications.Obtaining pure glycosphingolipid products to evaluate their biological capabilities/function has proved challenging. Techniques to synthesize synthetic glycosphingolipids have been developed using a variety of chemical procedures. However, they have proven to be complicated to carry out and often result in low product yields due to their complexity.

Researchers at UC Davis have developed an improved process to prepare glycosphingolipids using a simplified strategy whereby glycosphingosines are produced/used as an intermediary for creating glycosphingolipids.The technique allows for the efficient synthesis of glycosphingosines and glycosphingolipids, which can be easily cleansed by adding a commercially available detergent, thereby increasing reaction efficiency, and purified/filtered using commercially available solid extraction cartridges. The developed synthesis technique increases reaction dynamics and allows modifying the created glycosphingosines and glycosphingolipids by adding sugars and fats to evaluate the product's potential for new medical applications.

APPLICATIONS

- ▶ Efficient synthesis of a range of glycosphingosines and glycosphingolipids materials.
- ▶ Exploration of the created glycosphingosines and glycosphingolipids molecules for use in new diagnostic, disease, and therapeutic treatments.

FEATURES/BENEFITS

- ▶ Efficient synthesis of glycosphingosines and glycosphingolipidsusing a single reactor vessel.
- ▶ The synthesis technique is simpler to perform and avoids lengthy separation and purification steps.
- ▶ Product cleansing/purification is performed using commercially available detergents/extraction cartridges.
- ▶ Synthesis of glycosphingosines is environmentally friendly; it requires water, not toxic reagents.

PATENT STATUS

| Country                   | Type                           | Number                         | Dated      | Case     |
|---------------------------|--------------------------------|--------------------------------|------------|----------|
| Patent Cooperation Treaty | Reference for National Filings | <a href="#">WO 2024/097788</a> | 05/10/2024 | 2022-616 |

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ 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 Lactodifucotetraose
- ▶ 4-N-Derivatized Sialic Acids and Related Sialosides
- ▶ Substrate And Process Engineering For Biocatalytic Synthesis And Facile Purification Of Human Milk Oligosaccharides (HMOs)
- ▶ O-Acetyl Glycosphingosines and Gangliosides, as well as Their N-Acetyl Analogs
- ▶ Stable N-acetylated analogs of Sialic Acids and Sialosides
- ▶ Alpha2-6-Linkage-Specific Sialidase Mutants
- ▶ 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

**University of California, Davis**  
**Technology Transfer Office**

1 Shields Avenue, Mrak Hall 4th Floor,  
Davis,CA 95616

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Fax:  
530.754.7620