

# Novel Methods For Chemical Synthesis Of Lactosyl Sphingosines, Glucosylsphingosines, Galactosylsphingosines, And 3-O-Sulfogalactosylsphingosines

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## ABSTRACT

Researchers at the University of California, Davis, have developed new synthesis methods for the rapid and highly pure production of glycosphingolipids. The prototyped process can produce pure glycosphingolipids that can be used within basic disease research and drug and diagnostic development.

## FULL DESCRIPTION

Glycosphingolipids are ubiquitous membrane components that are subdivided into gangliosides and sulfatides. They are involved with events occurring on the cell surface, including the binding of viruses, bacterial toxins, adhesion molecules, and antibodies to the plasma membrane. As such, they are implicated in the pathogenesis of various diseases, including glycosphingolipidoses, autoimmune diseases, secretory diarrhea, cancer, and others. However, synthesizing glycosphingolipids for research, drug, and diagnostic purposes is complicated and expensive.

Researchers at the University of California, Davis, have developed two new methods for the rapid and straightforward synthesis of glycosphingolipids. The methods produce partially protected sphingosines, which are used as acceptors for chemical glycosylation to synthesize simple glycosylsphingosines. Thus far, the inventors have prototyped the methods and shown the ability to produce highly pure glycosphingolipids within the laboratory.

## APPLICATIONS

- ▶ Production of glycosphingolipids for basic disease research and drug and diagnostic development.

## FEATURES/BENEFITS

- ▶ A novel synthesis scheme that supports the production of highly complex glycosphingosines and glycosphingolipids.
- ▶ Highly pure, shorter synthesis duration/steps, and less costly.
- ▶ The synthesis method supports large-scale production.

## PATENT STATUS

Patent Pending

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## OTHER INFORMATION

### KEYWORDS

glycosphingolipids,  
synthesis, production,  
research, disease,  
diagnostics

### CATEGORIZED AS

- ▶ **Medical**
  - ▶ Diagnostics
  - ▶ New Chemical Entities, Drug Leads
  - ▶ Other
  - ▶ Research Tools
- ▶ **Research Tools**
  - ▶ Other
  - ▶ Protein Synthesis

## RELATED CASES

2022-617-0

## 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 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
- ▶ 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

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