

Alpha2-6-Linkage-Specific Sialidase Mutants

Tech ID: 29721 / UC Case 2018-318-0

ABSTRACT

Researchers at the University of California, Davis have developed alpha2-6-linkage-specific sialidase mutants with good enzyme activity.

FULL DESCRIPTION

Sialidases are crucial tools for determining presence and subsequent structural and functional characteristics of sialic-acid containing glycans. Although they can be used broadly and are mild enough for functional sialic acid studies or modification in biological samples, current sialidases have either a specificity towards alpha2-3-linked sialic acids or broad promiscuity towards sialic acids with alpha2-3-, alpha2-6- and alpha2-8-linkages. This limits the overall ability to study alpha2-6-linkage specific sialidases and sialic acid-containing biomolecules. There is a need for an alpha2-6-linkage-specific sialidases with good enzymatic activity.

Researchers at the University of California, Davis have developed alpha2-6-linkage-specific sialidase mutants with efficient ability to cleave various forms of sialic acid. The inventors have used structure-guided saturation mutagenesis to engineer photobacterium for improved alpha2-6-linkage sialidase specific activity. The mutant sialidase was successfully tested to show 101-fold improvement alpha2-6 sialidase activity over non-mutant sialidases. Additionally, the method used is applicable to different sialic-acid specific linkages and the sialidase mutants open up their use, in addition to glycan analysis, in therapeutic glycoproteins and vaccines.

APPLICATIONS

- ▶ Characterization of sialic acids on sensitive biological samples
- ▶ Structural and functional characterization of alpha2-6-linkage sialic acid-containing carbohydrates and glycoconjugates
- ▶ Enhance the immunogenicity of conjugated vaccines
- ▶ Improve serum half-life of circulating therapeutic glycoproteins

FEATURES/BENEFITS

- ▶ Photobacteria-derived sialidases
- ▶ Generated using sequential saturation mutagenesis and screened using high-throughput blue-white colony assay
- ▶ Method may be applied to different sialic acid-specific linkages to develop sialidase mutants

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,739,305	08/29/2023	2018-318

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INVENTORS

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OTHER INFORMATION

KEYWORDS

sialidase, neosialidase,
 neuraminidase,
 engineered
 glucosyltransferase,
 glycomics, directed
 evolution

CATEGORIZED AS

- ▶ **Materials & Chemicals**
 - ▶ Biological
- ▶ **Medical**
 - ▶ Other
 - ▶ Research Tools
- ▶ **Sensors & Instrumentation**
 - ▶ Biosensors

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 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
- ▶ Site Directed DNA Editing with Adenosine Deaminases that Act on RNA (ADAR) Enzymes
- ▶ 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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