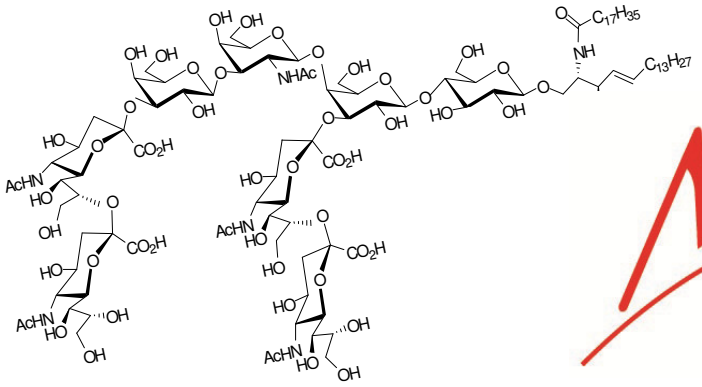
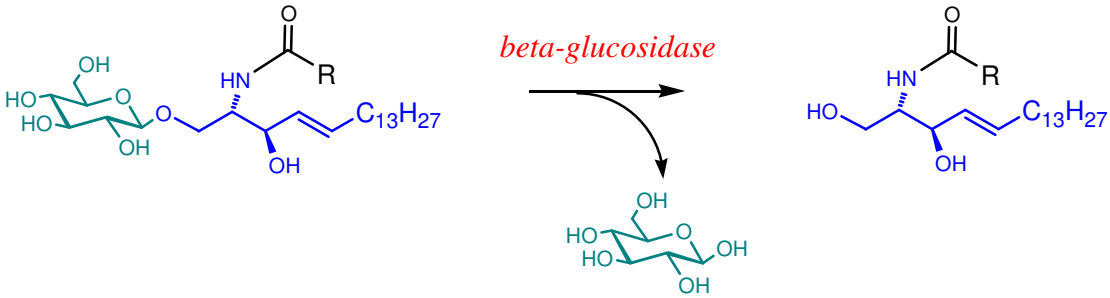


MATREYA LLC

Lipids and Biochemicals

NEWSLETTER FOR GLYCO/SPHINGOLIPID RESEARCH
FEBRUARY 2017

Exciting New Internal Standards for Gaucher Disease

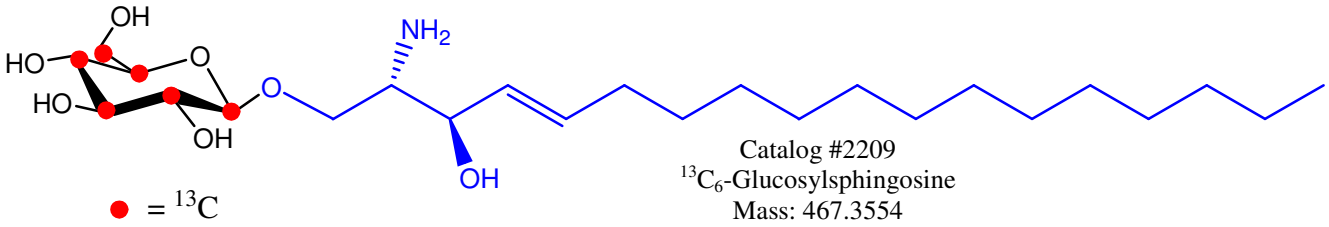


Lysosomal storage diseases (LSDs) are a heterogeneous group of disorders caused by lysosomal enzyme dysfunction[1]. Gaucher disease (GD) is the most common of these lysosomal storage disorders and has recently warranted much research due to the debilitating effects of excess lipid storage in Gaucher cells. A lack of activity in the lysosomal enzyme β-glucosidase, or occasionally in its activator protein saposin C, causes an accumulation of glucosylceramide, glucosylsphingosine and other glycosphingolipids in macrophage cells, especially in the liver, spleen, lung, and bone marrow. These lipid heavy cells are commonly known as "Gaucher cells" and can result in hepatosplenomegaly, cytopenia, skeletal disfunctions, lung disorders, and neuronal degradation. In lipid storage disorders such as GD, it is very important to diagnose and treat patients as early as possible. One very effective method of diagnosis is the use of biomarkers.

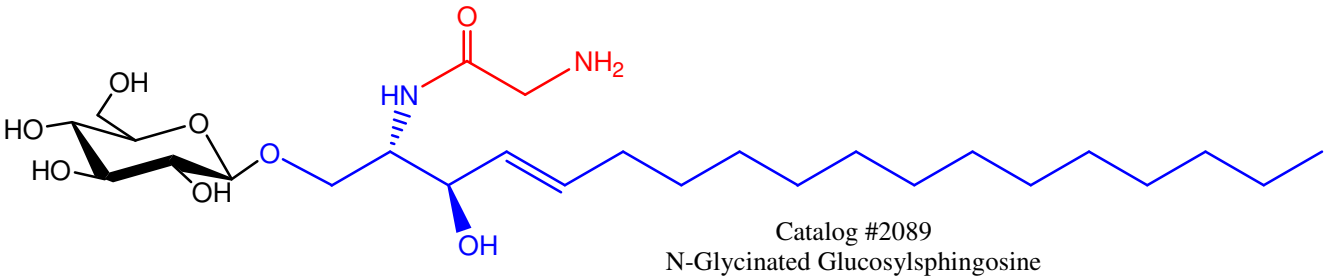
Chitotriosidase is the most well-established biomarker for GD. However, it is not specific for GD and may give a false negative in a significant percentage of GD patients due to mutation. Chitotriosidase also reflects the changes in the course of the disease belatedly. Furthermore, a significant percentage of the population, 6%, are deficient in the chitotriosidase gene.[2] Due to these limitations a more specific biomarker is needed for GD.

A. Rolfs et al.[3] recently demonstrated that glucosylsphingosine can be used as a promising, reliable, and specific biomarker for GD. They evaluated the sensitivity and specificity of glucosylsphingosine with regard to healthy controls vs. Gaucher desease carriers and other LSD control groups. Only GD patients displayed elevated levels of glucosylsphingosine higher than the pathological cut-off, verifying the specificity of glucosylsphingosine as a biomarker for GD. Glucosylsphingosine was monitored during enzyme replacement therapy and demonstrated a decrease in glucosylsphingosine over time.

Taking advantage of this glucosylsphingosine biomarker, M. Fuller et al.[4] have developed a quick and reproducible method for the determination of abnormally high glucosylsphingosine levels from 0.01 mL of plasma. The plasma is spiked with N-palmitoyl-d3-lactosylceramide as an internal standard, extracted with choroform/methanol, and centrifuged to remove the insoluble protein precipitates. The sample is then ready to be analyzed by LC/ESI-MS/MS. Recovery of the glucosylsphingosine was found to be >90% as calculated from the quality control samples and the calibration curve was linear over the entire relevant range. The assay was described as "accurate, reproducible, robust, and easy to perform in routine laboratory settings". This method found that glucosylsphingosine was elevated in all GD patients compared to unaffected controls and patients with other metabolic disorders. These results have validated the effectiveness of glucosylsphingosine in diagnosing Gaucher disease and in monitoring the results of enzyme replacement therapy.



Catalog #2209
$^{13}C_6$-Glucosylsphingosine
Mass: 467.3554



Catalog #2089
N-Glycinated Glucosylsphingosine
Mass: 518.3567

Matreya is pleased to now offer **$^{13}C_6$-Glucosylsphingosine** and **N-glycinated glucosylsphingosine** as new, highly specific, glucosylsphingosine **internal standards**. $^{13}C_6$-Glucosylsphingosine contains six carbon-13 units on the glucose moiety while N-Glycinated glucosylsphingosine contains a glycine attached to the amine of sphingosine. These sphingolipids are ideal for use as internal standards in the extraction and mass spectrometry analysis of samples. The free amine group of glycine gives very similar physical characteristics to the natural sphingolipid while the glycine adds an additional 57 units to the molecule, making it easy to detect by MS methods.[5]

References:
1. Manger B., Z Rheumatol, 69:6 (2010) 527-538
2. R. Boot et al., J. Biol. Chem. 273 (1998) 25680-25685
3. A. Rolf et al., PLoS One 8:11 (2013) e79732
4. M. Fuller et al., Clinica Chimica Acta 450 (2015) 6-10
5. R. Krüger et al. Journal of Chromatography B. 883-884 (2012) 128-135

Product Name	Catalog #	Amount	Purity
Glucocerebroside, Gaucher's Spleen	1057	5 mg	98+%
Glucosylsphingosine, synthetic	2086	5 mg	98+%
$^{13}C_6$-Glucosylsphingosine (new)	2209	1 mg	98+%
Glucosylsphingosine, bovine buttermilk	1306	5 mg	98+%
Glucosylsphingosine, plant	1310	5 mg	98+%
N-Glycinated glucosylsphingosine (new)	2089	1 mg	98+%
N-Hexanoyl-biotin-glucosylceramide	2085	5 mg	98+%
N-Hexadecanoyl-D_3-lactosylceramide, deuterated	1534	1 mg	98+%

Please visit www.matreya.com for a full list of glucosylceramides and derivatives