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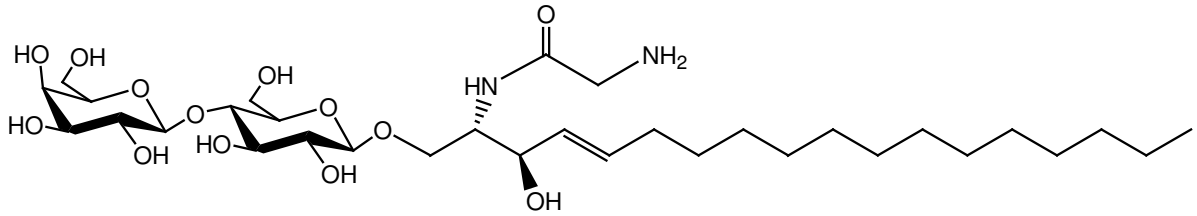
PRODUCT DATA SHEET

N-Glycinated lactosylsphingosine

Catalog No: 2090
Other Names: N-Glycinated *lyso*-lactosylceramide; N-Glycine 1-*beta*-lactosyl-sphing-4-enine
Source: synthetic
Solubility: Chloroform/methanol/DI water 2:1:0.1; DI water; DMSO
CAS No: N/A

Molecular Formula: $C_{32}H_{60}N_2O_{13}$
Molecular Weight: 681
Storage: -20°C
Purity: TLC > 98%; identity confirmed by MS
TLC System: chloroform/methanol/2.5M ammonium hydroxide (60:40:5 by vol.)
Appearance: solid



Application Notes:

N-Glycinated lactosylsphingosine is an analogue of the important biomolecule lactosylsphingosine. It is ideal for use as an internal standard in the extraction and mass spectrometry analysis of lactosylsphingosine from natural samples.(1) The free amine group gives this product very similar physical characteristics to the natural glycosphingolipid while the glycine adds an additional 57 units to the molecule making it easy to detect by MS.

Lactosylceramide is the precursor of many other glycosphingolipids and also functions as a second messenger and protein receptor, making it a very important biochemical. Many cellular processes are dependent on lactosylceramide since it is the substrate for neutral oligoglycosylceramides and gangliosides, all of which have their own vital functions. Lactosylceramide also helps to stabilize the lipid membrane, activate receptor molecules and act as a receptor for certain bacteria and toxins. In animals, where it is found mostly in epithelial and neuronal cells, it is expressed on neutrophils and macrophages, where it binds to toxins and bacteria, which are then engulfed and eliminated. It's role as a second messenger has been found to be vital and dysfunctions in its processes can lead to cancer and inflammation due to it being critical for neutrophil activity and in activating anti-inflammatory responses.(2) Therefore, it is being studied for its use in cancer therapies and as a therapy for other diseases. Other examples of lactosylceramide second messenger functions are tumor necrosis factor α and platelet-derived growth factor. Niemann-Pick Type C, a neurovisceral lysosomal cholesterol trafficking and lipid storage disorder, leads to an accumulation of multiple lipids, including excess unesterified cholesterol, GM2 and GM3 gangliosides, lactosylceramide, and glucosylceramide.(3) Lactosylceramide is also important in the activation of platelet/endothelial cell adhesion molecule-1 which causes adhesion and diapedesis of monocytes/lymphocytes.(4) In animals neutral *lyso*-glycosphingolipids occur naturally in small amounts. *lyso*-Lactosylceramide can release calcium stores from microsomes in the brain cortex and cerabellum.(5) Other *lyso*-glycosphingolipids also release calcium but in a mechanism different from *lyso*-lactosylceramide.

Selected References:

1. R. Krüger et al. Quantification of the Fabry marker lysoGb3 in human plasma by tandem mass spectrometry. *Journal of Chromatography B*., Vol. 883-884, pp. 128-135, 2012
2. Ravinder Pannu et al. A Novel Role of Lactosylceramide in the Regulation of Tumor Necrosis Factor α-mediated Proliferation of Rat Primary Astrocytes: IMPLICATIONS FOR ASTROGLIOSIS FOLLOWING NEUROTRAUMA. *Journal of Biological Chemistry,* Vol. 280 pp. 13742-13751, *2005*
3. M. Vanier et al. Diagnostic tests for Niemann-Pick disease type C (NP-C): A critical review. Molecular Genetics and Metabolism vol. 118 pp. 244-254, 2016
4. NanLing Gong. Lactosylceramide recruits PKCα/ε and phospholipase A_2 to stimulate PECAM-1 expression in human monocytes and adhesion to endothelial cells. *Proceedings of the National Academy of Sciences,* Vol. 101:17 pp. 6490-6495, *2004*
5. E. Loyl-Evans et al. *Lyso*-glycosphingolipids mobilize calcium from brain microsomes via multiple mechanisms. *Biochem. J*, BJ20030613, *2003*