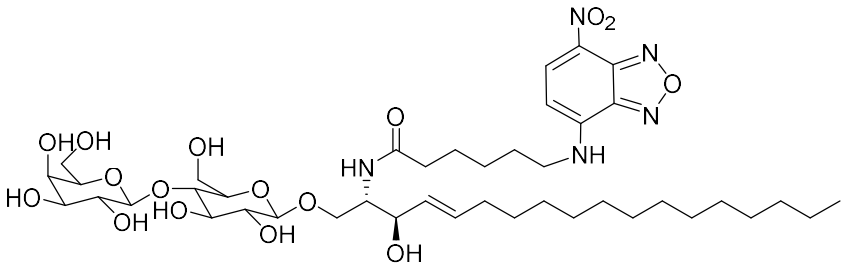
PRODUCT DATA SHEET

N-Hexanoyl-NBD-lactosylceramide

Catalog No: 1629; 1629-001
Common Name: N-Hexanoyl-NBD-*beta*-D-lactosylsphingosine; N-C6:0-NBD-*beta*-D-Lactosylsphingosine; N-C6:0-NBD-Lactosylceramide
Source: semisynthetic, bovine buttermilk
Solubility: chloroform/methanol (2:1 by vol.)
CAS No: 474943-04-9

Molecular Formula: $C_{42}H_{69}N_5O_{16}$
Molecular Weight: 900
Storage: -20°C
Purity: TLC > 98%; identity confirmed by MS
TLC System: chloroform/methanol/DI water (65:25:3 by vol.)
Appearance: solid



Application Notes:

This high purity fluorescent product is ideal for the identification of lactosylceramides in samples and biological systems. NBD has been shown to have only a small influence on lipid adsorption into cells and cellular membranes especially when the fatty acid is a short chain. This fluorescent analog of natural ceramide is comparable to C6:0-ceramide in many biological functions.[1] Lactosylceramide is the precursor of many other glycosphingolipids and also functions as a second messenger and protein receptor, making it a very important organic molecule. 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 acts 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. Its role as a second messenger has been found to be vital and dysfunctions in its processes can lead to cancer and inflammation since it is critical to neutrophil activity and in activating anti-inflammatory responses. 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. A deficiency in the enzyme responsible for hydrolyzing the galactose of lactosylceramide leads to lactosylceramidosis, which is characterized by an accumulation of lactosylceramide that causes a primary neurological disorder.[2] Lactosylceramide is also important in the activation of platelet/endothelial cell adhesion molecule-1 which causes adhesion and diapedesis of monocytes/lymphocytes.[3]

Selected References:

1. Y. Hayashi et al. "A sensitive and reproducible assay to measure the activity of glucosylceramide synthase and lactosylceramide synthase using HPLC and fluorescent substrates" *Analytical Biochemistry*, Vol. 345(2) pp. 181-186, *2005*
2. Glyn Dawson "Glycosphingolipid levels in an unusual neurovisceral storage disease characterized by lactosylceramide galactosyl hydrolase deficiency: lactosylceramidosis" *Journal of Lipid Research,* Vol. 13 pp. 207-219, *1972*
3. 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*

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