

PRODUCT DATA SHEET

Lactosylceramides

Catalog No: 1507; 1507-50

Common Name: LC; Lactocerebrosides; CDH;
Ceramide *beta*-lactoside;
LacCer

Source: natural, bovine buttermilk

Solubility: chloroform/methanol/DI water
(5:1:0.1 by vol.)

CAS No: 4682-48-8

Molecular Formula: C₅₃H₁₀₁NO₁₃

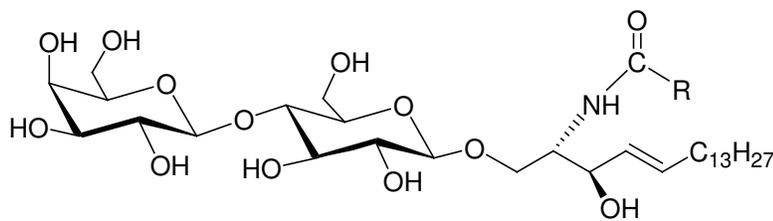
Molecular Weight: 960 (tricosanoyl)

Storage: -20°C

Purity: TLC > 98%; GC: >98%;
identity confirmed by MS

TLC System: chloroform/methanol/DI water
(65:25:4 by vol.)

Appearance: solid



Application Notes:

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, sulfatides 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.¹ 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 *alpha* 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. R. Pannu et al. "A Novel Role of Lactosylceramide in the Regulation of Tumor Necrosis Factor *alpha*-mediated Proliferation of Rat Primary Astrocytes: IMPLICATIONS FOR ASTROGLIOSIS FOLLOWING NEUROTRAUMA" *Journal of Biological Chemistry*, Vol. 280 pp. 13742-13751, 2005
2. G. 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. N. Gong "Lactosylceramide recruits PKC α/ϵ and phospholipase A₂ 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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