MATREYA LLC
Lipids and Biochemicals
2178 High Tech Road, State College, PA 16803
Tel. 814-355-1030 Fax 814-355-1031 www.matreya.com

PRODUCT DATA SHEET

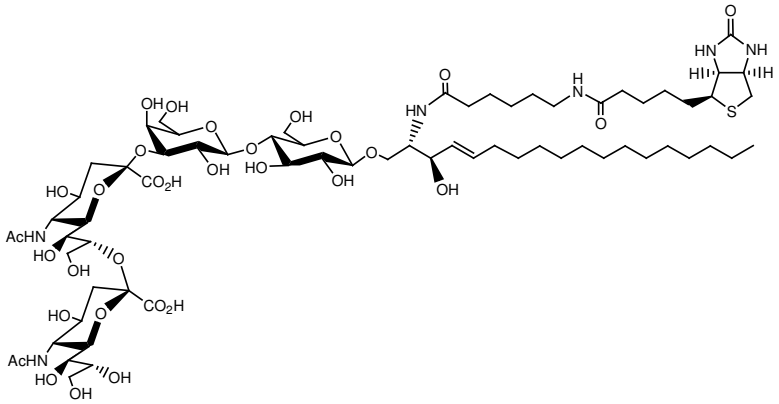
N-Hexanoyl-biotin-disialoganglioside GD_3

Catalog number: 2055
Synonyms: Biotin-C6:0-GD_3
Source: semi-synthetic, bovine buttermilk
Solubility: chloroform/methanol/DI water, 2:1:0.1
CAS number: N/A
Molecular Formula: $C_{68}H_{116}N_6O_{31}S$

Molecular Weight: 1546
Storage: -20°C
Purity: TLC: >98%; identity confirmed by MS
TLC System: chloroform/methanol/2.5N ammonium hydroxide (60:40:9)
Appearance: solid

Application Notes:

This ganglioside GD_3 analogue contains a biotin unit attached to the amine of the sphingosine moiety via a hexanoic acid linker and is ideal for use in ganglioside studies. The biotin structure allows for attachment of the ganglioside to streptavidin and avidin substrates making it extremely useful for binding to substrates and for toxin detection.[1]



Gangliosides are acidic glycosphingolipids containing one or more sialic acids that generally form lipid rafts in the outer leaflet of the cell plasma membrane, especially in neuronal cells in the central nervous system.[2,3] They participate in many cellular activities including proliferation, differentiation, adhesion, signal transduction, cell-to-cell interactions, tumorigenesis, and metastasis.[4] The accumulation of gangliosides has been linked to several diseases including Tay-Sachs and Sandhoff disease while an autoimmune response against gangliosides can lead to Guillain-Barre syndrome. Gangliosides act as receptors for various toxins and bacteria, accumulate in various tumors, and aid in many neuronal functions.

Disialoganglioside GD_3 is predominantly expressed during neuronal development and its expression becomes very limited in adult tissues. GD_3 expression is unusually high in basal cell carcinomas and malignant melanomas and is thought to be a human melanoma-specific antigen. Although GD_3 is not immunogenic it has been investigated as a tool for immunotargeting human melanoma cells.[4] Over expression of GD_3 has led to apoptosis by recruiting mitochondria to apoptotic pathways and suppressing NF-κB activation and subsequent κB-dependent gene induction.[5] Increased levels of GD_3 have also been found to be associated with proliferative diseases, such as atherosclerosis.

Selected References:

1. A. Pukin et al. Chemoenzymatic synthesis of biotin-appended analogues of gangliosides GM_2, GM_1, GD_1a and GalNAc-GD_1a for solid-phase applications and improved ELISA tests. *Org. Biomol. Chem.*, 9(16):5809-5815, *2011*
2. L. Svennerholm, et al. (eds.), *Structure and Function of Gangliosides,* New York, Plenum, *1980*
3. T. Kolter, R. Proia, K. Sandhoff, Combinatorial Ganglioside Biosynthesis. *J. Biol. Chem.*, July Vol. 277, No. 29, pp. 25859-25862, *2002*
4. H. Jennings et al. "Bioengineering of Surface GD3 Ganglioside for Immunotargeting Human Melanoma Cells" *Journal of Biological Chemistry,* Vol. 279:24 pp. 25390, *2004*
5. J. Fernández-Checa et al. "Ganglioside GD3 Sensitizes Human Hepatoma Cells to Cancer Therapy" *Journal of Biological Chemistry*, Vol. 277:51 pp. 49870, *2002*