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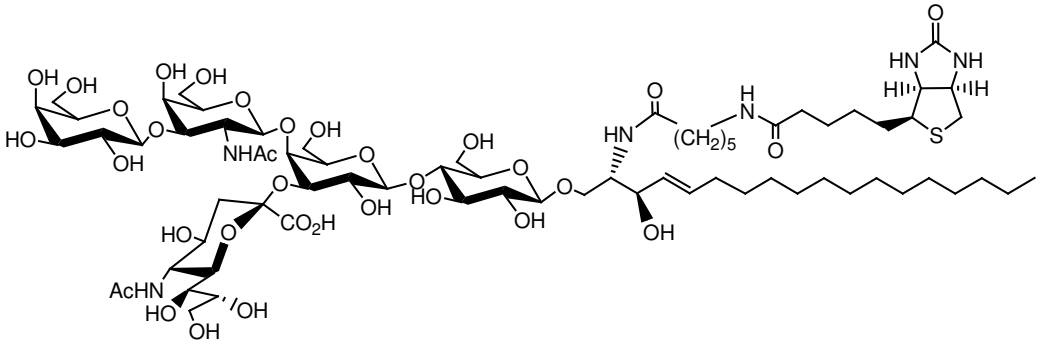
PRODUCT DATA SHEET

N-Hexanoyl-biotin-monosialoganglioside GM_1

Catalog number: 2053
Synonyms: Biotin-C6:0-GM_1
Source: synthetic
Solubility: chloroform/methanol/DI water, 2:1:0.1
CAS number: N/A
Molecular Formula: $C_{71}H_{122}N_6O_{33}S$

Molecular Weight: 1620
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 GM_1 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. They are therefore very important in therapeutic processes and have warranted much research. GM_1 stimulates neuronal sprouting and enhances the action of nerve growth factor (NGF) by directly and tightly associating with Trk, the high-affinity tyrosine kinase-type receptor for NGF. GM_1 has also been identified as the specific cell surface receptor for cholera toxin making it an important target for therapeutic interventions.[5]

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. S. Birkle, G. Zeng, L. Gao, R. K. Yu, and J. Aubry. Role of tumor-associated gangliosides in cancer progression. *Biochimie*, 85, 455–463, *2003*
5. C. E. Miller, J. Majewski, R. Faller, S. Satija, and T. L. Kuhl, Cholera Toxin Assault on Lipid Monolayers Containing Ganglioside GM_1. B*iophysj*., June Vol. 86(6), 3700–3708, *2004*