

# PRODUCT DATA SHEET

## Disialoganglioside GD<sub>1a</sub> (Na<sup>+</sup> salt), bovine

**Catalog No:** 1556

**Common Name:** GD<sub>1a</sub>

**Source:** natural, bovine

**Solubility:** chloroform/methanol/DI water,  
(2:1:0.1); forms micellar solution in water

**CAS No:** 12707-58-3

**Molecular Formula:** C<sub>84</sub>H<sub>148</sub>N<sub>4</sub>O<sub>39</sub> • 2Na

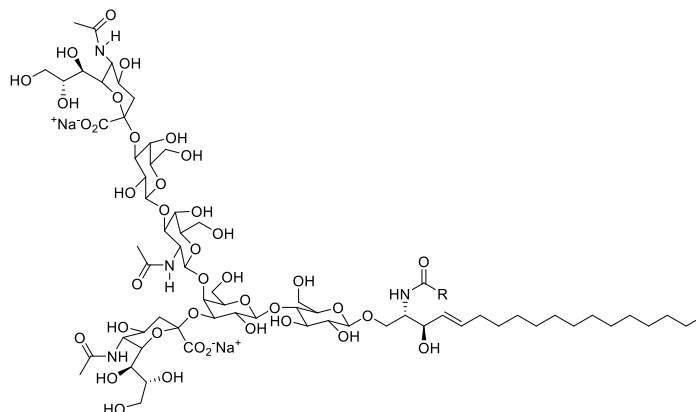
**Molecular Weight:** 1838 + 2Na (Stearoyl)

**Storage:** -20°C

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

**TLC System:** chloroform/methanol/  
2.5N ammonium hydroxide,  
(60:40:9 by vol.)

**Appearance:** solid



### Application Notes:

Gangliosides<sup>1</sup> are acidic glycosphingolipids that form lipid rafts in the outer leaflet of the cell plasma membrane, especially in neuronal cells in the central nervous system. They participate in cellular proliferation, differentiation, adhesion, signal transduction, cell-to-cell interactions, tumorigenesis, and metastasis.<sup>2</sup> The accumulation of gangliosides has been linked to several diseases including Tay-Sachs and Sandhoff disease. An autoimmune response against gangliosides can lead to Guillain-Barre syndrome. GD<sub>1a</sub> is one of the major brain gangliosides. It is a coreceptor of Toll-like receptor 2 signaling<sup>3</sup> and it inhibits concanavalin A-induced 45Ca<sup>2+</sup> uptake although it is not cytotoxic nor does it significantly alter the rate of Ca<sup>2+</sup> efflux. Along with other gangliosides GD<sub>1a</sub> enhances tumor cell proliferation, invasion, and metastasis. It is a receptor for cholera toxin and contributes to the sodium channel functional variability within and between neuronal cells. GD<sub>1a</sub> causes a significant increase in the responsiveness of epidermal growth factor receptors, a condition that is often associated with the formation of tumors.<sup>4</sup>

### Selected References:

1. L. Svennerholm, et al. (eds.), *Structure and Function of Gangliosides*, New York, Plenum, 1980
2. 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
3. Shuang Liang et al "Ganglioside GD<sub>1a</sub> Is an Essential Coreceptor for Toll-like Receptor 2 Signaling in Response to the B subunit of Type IIb Enterotoxin" *The Journal of Biological Chemistry*, March, Vol. 282 pp. 7532-7542, 2007
4. Yihui Liu, Ruixiang Li and Stephan Ladisch "Exogenous Ganglioside GD<sub>1a</sub> Enhances Epidermal Growth Factor Receptor Binding and Dimerization" *The Journal of Biological Chemistry*, August, Vol. 279 pp. 36481-36489, 2004

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