

PRODUCT DATA SHEET

N-Hexanoyl-NBD-phytosphingosine

Catalog number: 1628

Common Name: N-C6:0-NBD-Phytoceramide;
N-C6:0-NBD-
Phytosphingosine

Source: semisynthetic, bacteria

Solubility: chloroform/methanol (2:1); methanol

CAS number: 477239-93-3

Molecular Formula: C₃₀H₅₁N₅O₇

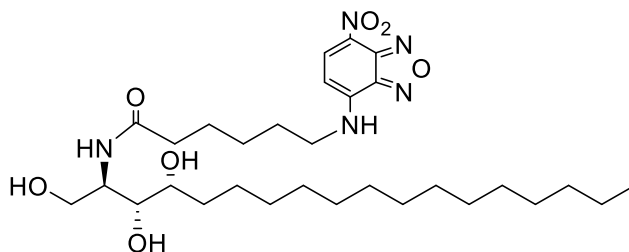
Molecular Weight: 594

Storage: -20°C

Purity: TLC >98%; identity confirmed by MS

TLC System: chloroform/methanol (90:10 by vol.)

Appearance: solid



Application Notes:

This product is a fluorescent analog of natural C6:0-phytosphingosine. The 7-nitrobenz-2-oxa-1,3-diazol-4-yl (NBD) fluorescent group has been shown to have only a small influence on lipid adsorption into cells and cellular membranes. This fluorescent analog of natural phytoceramide is comparable to C6:0-phytoceramide in many biological functions, such as lipid uptake and transport,¹ but is not active in all systems. While human glucosylceramide synthase readily takes up and glycosylates C6:0-NBD-phytoceramide the fungal *Cryptococcus neoformans* does not.² Phytosphingosine is a long-chain sphingoid base having important cellular functions such as signaling, cytoskeletal structure, cellular cycle, and heat stress response. Phytosphingosine can lead to apoptosis via two distinct pathways and has been investigated as a possible cancer therapeutic treatment.³ Phytoceramides (fatty acid acylated to Phytosphingosine) are distributed at the microvillous membrane of the epithelial cells of the small intestine. Crypt cells and the adjacent epithelial cells produce phytosphingoglycolipids in much greater quantities than more differentiated epithelial cells.⁴ The kidney and skin also contain phytosphingoglycolipids although in much lower concentrations than in the small intestine. Phytoceramides form part of the water barrier lipids of the skin.

Selected References:

1. W. Wang et al. "An Inositolphosphorylceramide Synthase Is Involved in Regulation of Plant Programmed Cell Death Associated with Defense in Arabidopsis" *Plant Cell*, vol. 20 pp. 3163-3179, 2008
2. P. Rittershaus et al. "Glucosylceramide synthase is an essential regulator of pathogenicity of *Cryptococcus neoformans*" *Journal of Clinical Investigation*, vol. 116 pp. 1651-1659, 2006
3. M. Park et al. "Suppression of Extracellular Signal-related Kinase and Activation of p38 MAPK Are Two Critical Events Leading to Caspase-8- and Mitochondria-mediated Cell Death in Phytosphingosine-treated Human Cancer Cells" *Journal of Biological Chemistry*, Vol. 278, pp. 50624-50634, 2003
4. F. Omae et al. "DES2 protein is responsible for phytoceramide biosynthesis in the mouse small intestine" *Journal of Biochemistry*, vol. 379 pp. 687-695, 2004

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