

# PRODUCT DATA SHEET

## N-Dodecanoyl-NBD-phytosphingosine

**Catalog number:** 1627

**Common names:** N-C12:0-NBD-Phytoceramide; N-C12:0-NBD-Phytosphingosine

**Source:** semisynthetic, bacteria

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

**CAS number:** N/A

**Molecular Formula:** C<sub>36</sub>H<sub>63</sub>N<sub>5</sub>O<sub>7</sub>

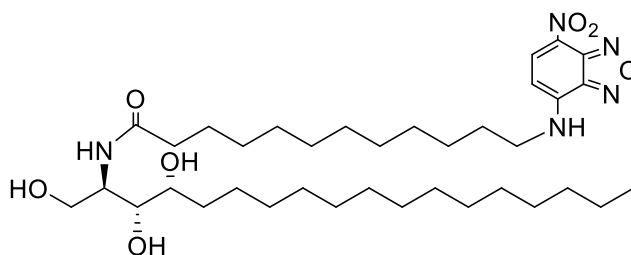
**Molecular Weight:** 678

**Storage:** -20°C

**Purity:** TLC >98%

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

**Appearance:** orange solid



### Application Notes:

This product is a fluorescent analog of natural N-C12:0-phytoceramide. 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 N-C12:0-phytoceramide in many biological functions, such as lipid uptake and enzyme activity<sup>1</sup> but is not equivalent in all systems. N-C12-NBD-phytoceramide is hydrolyzed by alkaline ceramidase 3 with significantly more activity than the non-fluorescent natural ceramide.<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup> 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. C. Yuan et al. "CDase is a pan-ceramidase in *Drosophila*" *Mol. Biol. Cell*, vol. 22 pp. 33-43, 2011
2. Z. Mao et al. "Alkaline Ceramidase 2 (ACER2) and Its Product Dihydrosphingosine Mediate the Cytotoxicity of *N*-(4-Hydroxyphenyl)retinamide in Tumor Cells" *The Journal of Biological Chemistry*, vol. 285 pp. 19078-19090, 2010
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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