

## PRODUCT DATA SHEET

### N-Octadecanoyl-D<sub>3</sub>-D-erythro-sphingosine-1-phosphate, deuterated

**Catalog number:** 2206

**Common Name:** N-C18:0-D<sub>3</sub>-Ceramide-1-phosphate; N-Stearoyl-D<sub>3</sub>-C1P

**Source:** synthetic

**Solubility:** chloroform/methanol/acetic acid (60:15:25 by vol.);  
chloroform/methanol/7.5M ammonium hydroxide 80:20:4

**CAS number:** N/A

**Molecular Formula:** C<sub>36</sub>H<sub>69</sub>D<sub>3</sub>NO<sub>6</sub>P

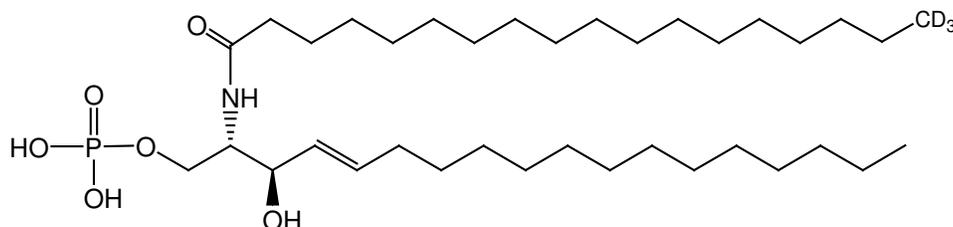
**Molecular Weight:** 649

**Storage:** -20°C

**Purity:** TLC > 98%

**TLC System:** chloroform/methanol/  
7.5M ammonium hydroxide  
(70:40:10 by vol.)

**Appearance:** solid



#### Application Notes:

This deuterated ceramide-1-phosphate is ideal as a mass spectrometry standard and for *in vivo* and *in vitro* investigations. Ceramide-1-phosphate is one of several important phosphosphingolipids in mammalian cells and it is generated by the phosphorylation of ceramide by the enzyme ceramide kinase. Ceramide-1-phosphate is currently attracting much attention in research due to its important cellular functions like its role in inflammation, as a novel second messenger, and its involvement in cellular processes like phagocytosis, potassium channel function, inflammatory responses, cell survival, and tumorigenesis. The first reported biological action of ceramide-1-phosphate was its ability to stimulate DNA synthesis and cell division.

Ceramide-1-phosphate was also found to be mitogenic for both fibroblasts and macrophages. The mitogenic effect of ceramide-1-phosphate is dependent on its intracellular ability to stimulate reactive oxygen specie production in macrophages *via* the enzyme NADPH oxidase. This enzyme is downstream of PKC- $\alpha$  and cPLA(2)- $\alpha$  in this pathway.

Another important function of ceramide-1-phosphate is its promotion of cell survival. Ceramide-1-phosphate stimulates the phosphatidylinositol 3-kinase (PI3-K)/protein kinase B (PKB) pathway, a major mechanism whereby growth factors promote cell survival. It is probable that ceramide-1-phosphate blocks apoptosis by stimulating the PI3-K/PKB/NF-kappaB pathway and thereby maintaining the production of antiapoptotic Bcl-X(L). Based on these and previous findings it has been proposed that the inhibition of acid sphingomyelinase and the subsequent decrease in ceramide levels would allow cell signaling through stimulation of the PI3-K/PKB pathway to promote cell survival.

#### Selected References:

1. E. Kooijman et al. Structure of Ceramide-1-Phosphate at the Air-Water Solution Interface in the Absence and Presence of Ca<sup>2+</sup>. *Journal of Biophysics*, Vol. 96(6), pp. 2204-2215, 2009
2. R. Stahelin et al. Ceramide-1-phosphate Binds Group IVA Cytosolic Phospholipase a2 via a Novel Site in the C2 Domain. *The Journal of Biological Chemistry*, Vol. 282(28) pp. 20467-20474, 2007
3. Arana, L. et al. Generation of reactive oxygen species (ROS) is a key factor for stimulation of macrophage proliferation by ceramide 1-phosphate. *Exp. Cell Res.*, Vol. 318(4) pp. 350-360, 2012
4. Gómez-Muñoz A. et al. Ceramide-1-phosphate promotes cell survival through activation of the phosphatidylinositol 3-kinase/protein kinase B pathway. *FEBS Lett.*, Vol. 579(17) pp. 3744-3750, 2005

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