

PRODUCT DATA SHEET

N-omega-CD₃-Octadecanoyl-D-erythro-sphingosine

Catalog number: 2201

Synonyms: N-C18:0-CD₃-D-erythro-Ceramide; N-Stearoyl-CD₃-D-erythro-sphingosine

Source: synthetic

Solubility: chloroform, hot ethanol, DMF

CAS number: N/A

Molecular Formula: C₃₆H₆₈NO₃D₃

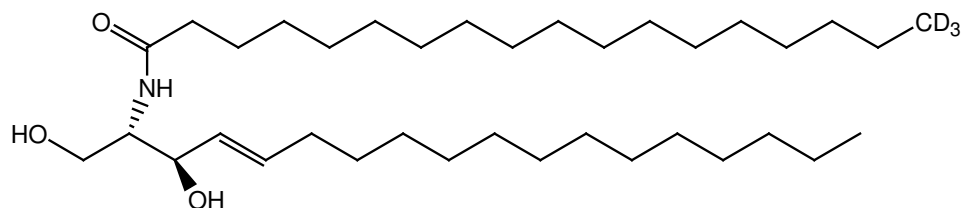
Molecular Weight: 569

Storage: -20°C

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

TLC System: chloroform/methanol, 95:5

Appearance: solid



Application Notes:

This product is a well-defined ceramide containing a deuterated stearic acid acylated to the sphingosine base making it an ideal stable isotope-labeled standard for lipidomic studies using mass spectrometry. Stable isotope-labeled tracers are ideal for studies involving the metabolism and various metabolites of a lipid and can be used for the quantitative evaluation of major lipid pathways.¹ Lipidomics has shown great success in the use of deuterium labeled compounds in identifying and quantifying individual molecular species by the use of tandem mass spectrometry.² Ceramide is a fatty acid amide of sphingosine that has many important biological functions and is the precursor for many complex glycosphingolipids. Ceramide functions as a precursor in the synthesis of sphingomyelin, glycosphingolipids, and of free sphingosine and fatty acids. The sphingosine can be phosphorylated to form sphingosine-1-phosphate. Two of ceramide's metabolites, sphingosine-1-phosphate and glucosylceramide, produce cell proliferation and other cellular functions.³ Ceramide exerts numerous biological effects, including induction of cell maturation, cell cycle arrest, terminal cell differentiation, cell senescence, and cell death.⁴ Because of these effects ceramide has been investigated for its use in cancer treatment and many potential approaches to cancer therapy have been presented.⁵ Other effects include producing reactive oxygen in mitochondria (followed by apoptosis) and stimulating phosphorylation of certain proteins (especially mitogen activated protein). It also stimulates some protein phosphatases (especially protein phosphatase 2A) making it an important controller of protein activity.

Selected References:

1. Magkos, F. and Mittendorfer, B., "Stable isotope-labeled tracers for the investigation of fatty acid and triglyceride metabolism in humans in vivo" *Clin Lipidol.* Vol. 4 pp. 215-230, 2009
2. Byun, H. and Bittman, R. Selective deuterium labeling of the sphingoid backbone: facile syntheses of 3,4, 5-trideuterio-D-erythro-sphingosine and 3-deuterio-D-erythro-sphingomyelin" *Chem Phys Lipids*, Vol. 163(8) pp. 809-813, 2010
3. J. M. Hauser, B. M. Buehrer, and R. M. Bell "Role of ceramide in mitogenesis induced by exogenous sphingoid bases." *Journal of Biological Chemistry* Vol. 269 pp. 6803, 1994
4. N. S. Radin, "Killing tumours by ceramide-induced apoptosis: a critique of available drugs" *Biochemical Journal*, Vol. 371 pp. 243-256, 2003
5. N. S. Radin, "Designing anticancer drugs via the achilles heel: ceramide, allylic ketones, and mitochondria" *Bioorganic and Medicinal Chemistry*, Vol. 11(10) pp. 2123-2142, 2003

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