

PRODUCT DATA SHEET

Ceramides (hydroxy)

Catalog No: 1323, 1323-05

Common Name: Ceramides with mostly hydroxy acyl groups

Source: natural, bovine spinal cord

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

Molecular Formula: C₃₆H₇₁NO₄ (2-hydroxystearoyl)

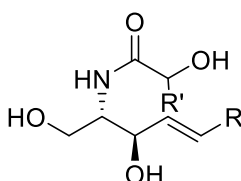
Molecular Weight: 582 (2-hydroxystearoyl)

Storage: -20°C

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

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

Appearance: solid



Application notes:

Ceramide is a fatty acid amide of sphingosine. This product contains ceramides with mostly 2-hydroxy fatty acids (*alpha*-hydroxy fatty acids). 2-hydroxy fatty acid ceramides are especially abundant in nervous and epidermal cells. These ceramides are important for the permeability barrier function of epidermis and the lipid organization in membranes. The 2-hydroxylation is catalyzed by fatty acid 2-hydroxylase (FA2H or fatty acid *alpha*-hydroxylase). 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.¹ Ceramide exerts numerous biological effects, including induction of cell maturation, cell cycle arrest, terminal cell differentiation, cell senescence, and cell death.² Because of these effects ceramide has been investigated for its use in cancer treatment and many potential approaches to cancer therapy have been presented.³ 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. Ceramides with short side chains have been shown to enter easily into cells where they are biologically active. Ceramides with longer side chains also enter cells if dissolved in dodecane-isopropanol first.

Selected References:

1. 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
2. N. S. Radin, "Killing tumours by ceramide-induced apoptosis: a critique of available drugs" *Biochemical Journal*, Vol. 371 pp. 243-256, 2003
3. 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
4. Midori Yano, Etsu Kishida, Yuka Muneyuki, and Yasuo Masuzawa "Quantitative analysis of ceramide molecular species by high performance liquid chromatography" *Journal of Lipid Research*, Vol. 39 pp. 2091-2098, 1998

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