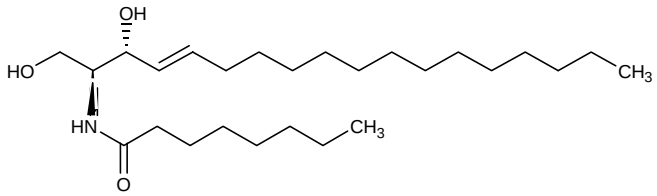
3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

N–OCTANOYL–D–SPHINGOSINE

Product Number **O 1882**
Storage Temperature: -20 °C

Synonyms: C_8 Ceramide
N-Octanoyl-D-*erythro*-Sphingosine



Product Description

Molecular Formula: $C_{26}H_{51}NO_3$
Molecular Weight: 425.7
Purity: >98%
Appearance: Waxy solid

N-octanoyl-D-sphingosine or C_8 ceramide (C8) is one in the series of short acyl chain lengths synthetic analogs of natural C_{16} ceramide (C16). Ceramide is an endogenous lipid component of a sphingomyelin biochemical pathway, which is initiated upon activation of various sphingomyelinases and results in the cleavage of sphingomyelin to ceramide and phosphorylcholine. Ceramides are metabolized to sphingosine and sphingosine-1-phosphate.[1,2] Ceramides are generated in response to cellular stimulation by hormones, inflammatory cytokines, FAS ligands and chemotherapeutic agents and play an essential role in mediating stress responses. Ceramides induce cell differentiation, activation of caspases, DNA fragmentation, apoptosis and cell-cycle arrest.[3-7]

Synthetic, cell permeable ceramides and ceramide-phosphates analogs are used to study intracellular signaling, cell migration, cell death, and modulation of protein kinase C activity (PKC). Synthetic ceramides exist in four stereoisomers: *D-erythro, D-threo, L-erythro and L-threo*, of which only *d-erythro*–ceramide occurs in nature. D-*erythro*-isoform is 10 times more active than L-*threo*-isoform.[8]

The effects of short-chain synthetic analogues such as N-octanoyl-D-sphingosine and natural ceramides on PKC activity were investigated in rat brain cells. The synthetic analogues activated PKC in the presence of diolein while natural ceramide (C16) had no direct effect on PKC *in vitro*.[9] These results suggest that synthetic short-chain ceramide analogues may have biological effects not exhibited by natural ceramides, and their use in the study of cell growth and other phenomena may result in unexpected changes in related metabolites.[10] N-octanoyl-sphingosine induces phosphorylation on Thr-669 in A-431 cells by stimulation of ceramide-activated protein kinase. It also stimulates IL–2 secretion and induces apoptosis.[10]

Preparation Instructions

N-octanoyl–D–sphingosine is soluble in ethanol, dichloromethane and methanol.

Storage/Stability

Store at –20 °C for up to twelve months.

References

1. Perry, D.K., et al., The role of ceramide in cell signaling. Biochim. Biophys. Acta, **1436**, 233-243 (1998).
2. Gomez-Munoz, A., et al., Short-chain ceramide-1-phosphates are novel stimulators of DNA synthesis and cell division: antagonism by cell-permeable ceramides. Mol. Pharmacol., **47**, 833-839 (1995).
3. Sharma, K., The yins and yangs of ceramide. Cell Res., 1-10 (1999).
4. Salinas, M., et al., Inhibition of PKB/Akt1 by C2-ceramide involves activation of ceramide-activated protein phosphatase in PC12 cells., Mol. Cell Neurosci., **15**, 156-69 (2000).
5. Hinkovska-Galcheva, V.T., et al., The formation of ceramide-1-phosphate during neutrophil phagocytosis and its role in liposome fusion. J. Biol. Chem., **273**, 33203-33209 (1998).
6. Bielawska, A., et al., Selectivity of ceramide-mediated biology. Lack of activity of erythro-dihydroceramide. J. Biol. Chem., **268,** 26226-262232 (1993).

7. Hannun, Y.A., Luberto, C., Ceramide in the eukaryotic stress response. Trends Cell. Biol., **2**, 73-80 (2000).
8. Michel, C., et al., Characterization of ceramide synthesis. A dihydroceramide desaturase introduces the 4,5-trans-double bond of sphingosine at the level of dihydroceramide. J. Biol. Chem., **272**, 22432-22437 (1997).
9. Huang, H.W., et al., Ceramides modulate protein kinase C activity and perturb the structure Phosphatidylcholine/Phosphatidylserine bilayers. Biophys. J., **77**, 1489-1497 (1999).
10. Abe, A., et al., Metabolic effects of short chain ceramide and glucosylceramide on sphingolipids and protein kinase C., Eur. J. Biochem., **210**, 765-773 (1992).

AH 03/03