

PRODUCT DATA SHEET

D-erythro-C20-Sphingosine

Catalog number: 1840

Common Name: Sphingosine with C20 chain

Source: synthetic

Solubility: chloroform, methanol, ethanol,
DMSO

CAS number: 6918-49-6

Molecular Formula: C₂₀H₄₁NO₂

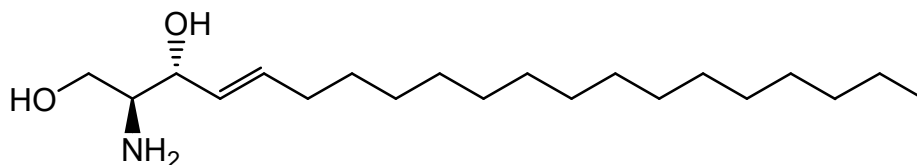
Molecular Weight: 328

Storage: -20°C

Purity: TLC >98%, GC >98%, HPLC >98%;
identity confirmed by MS

TLC System: chloroform/methanol/DI water/
ammonium hydroxide
(70:20:1:1)

Appearance: solid



Application Notes:

Sphingosine is a characteristic structural unit of sphingolipids such as ceramides, gangliosides, globosides, sulfatides, sphingomyelin, and others.¹ It is most abundant in nervous tissue and cell membranes. Sphingosine with an 18-carbon chain and a double bond at carbon 4 is the most abundant sphingosine in animal tissues but C20-sphingosine is the most abundant in many other organisms. C20-sphingosine acylated to gangliosides can be found in significant amounts in the central nervous system of mammals but is almost non-existent in other mammalian tissues.² The ratio of C20:C18-sphingosine has been shown to increase with age in at least some mammals. Interestingly, in sialic acid containing sphingolipids an increase of C20-sphingosine is found to correspond with an increase in sialic acid groups. The seemingly minor difference between C18 and C20 sphingosines of two carbons results in significant differences in their physical and chemical properties such as aggregation characteristics and monolayer formation.³ These differences result in critical biological functions of their sphingolipid derivatives. Sialic acid containing sphingolipids such as gangliosides form micelles in water and this micellar size is directly influenced by the chain length of the sphingosine. Lysosphingolipids inhibit protein kinase C activity resulting in the pathogenesis of sphingolipidoses such as Krabbe's disease and Gaucher's disease. Sphingosine can be phosphorylated via two kinases to form sphingosine-1-phosphate, which has important signaling functions. While sphingosines and ceramides can induce apoptosis,⁴ sphingosine-1-phosphate can promote cell survival or proliferation. Sphingosine has been shown to cause an increase in the cytoplasmic calcium level of cells.

Selected References:

1. A. Merrill, Jr. "De Novo Sphingolipid Biosynthesis: A Necessary, but Dangerous, Pathway" *The Journal of Biological Chemistry*, Vol. 277(29) pp. 25843-25846, 2002
2. S. Sonnino and V. Chigorno "Ganglioside molecular species containing C18- and C20-sphingosine in mammalian nervous tissues and neuronal cell cultures" *Biochimica et Biophysica Acta*, Vol. 1469(2) pp. 63-77, 2000
3. D. Vaknin "Structure-Function Relations in Self-Assembled C18- and C20-Sphingosines Monolayers at Gas/Water Interfaces" *Journal of the American Chemical Society*, Vol. 125 pp. 1313-1318, 2003
4. V. Nava et al. "Sphingosine Enhances Apoptosis of Radiation-resistant Prostate Cancer Cells" *Cancer Research*, Vol. 60 pp. 4468-4474, 2000

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