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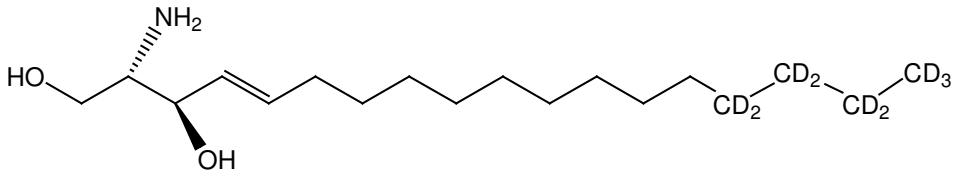
PRODUCT DATA SHEET

D-*erythro*-Sphingosine, D9

Catalog number: 2079
Synonyms: 15,15,16,16,17,17,18,18,18-D9-2-Amino-octadec-4-ene-1,3-diol
Source: synthetic
Solubility: chloroform, ethanol, methanol, DMSO
CAS number: N/A

Molecular Formula: $C_{18}H_{28}D_9NO_2$
Molecular Weight: 309
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:

This synthetic D-*erythro*-sphingosine contains nine deuterium atoms 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] This deuterated sphingosine can also be used in the preparation of sphingolipids that are labeled on the sphingosine chain. In this way deuterated ceramides can be prepared that will not lose their label if the fatty acid is cleaved off *in vivo* and replaced by an alternate fatty acid.

Sphingosine is a characteristic structural unit of many sphingolipids such as ceramides, gangliosides, globosides, sulfatides, sphingomyelin, and others.[3,4] 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. Lysosphingolipids inhibit protein kinase C activity resulting in the pathogenesis of sphingolipidoses such as Krabbe's disease and Gaucher's disease.[5] Sphingosine can be phosphorylated via two kinases to form sphingosine-1-phosphate, which has important signaling functions. While sphingosines and ceramides can induce apoptosis,[6] sphingosine-1-phosphate can promote cell survival or proliferation. Sphingosine has also been shown to cause an increase in the cytoplasmic calcium level of cells.

Selected References:

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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. A. Merrill, Jr. "*De Novo* Sphingolipid Biosynthesis: A Necessary, but Dangerous, Pathway" *The Journal of Biological Chemistry*, Vol. 277(29) pp. 25843–25846, *2002*
4. J. Shayman "Sphingolipids" *Kidney International*, Vol. 58 pp. 11-26, 2000
5. Y. Hannun and R. Bell "Lysosphingolipids inhibit protein kinase C: implications for the sphingolipidoses." Vol. 235:4789 pp. 670, *1987*
6. V. Nava et al. "Sphingosine Enhances Apoptosis of Radiation-resistant Prostate Cancer Cells" *Cancer Research*, Vol. 60 pp. 4468-4474, *2000*