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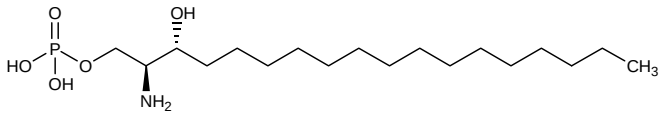
ProductInformation

D-*erythro*-Dihydrosphingosine 1- phosphate

Product Number **D 3439**
Storage Temperature –20 °C

Synonyms: SPP, dihydro S1P



Product Description
Molecular Formula: $C_{18}H_{40}NO_5P$
Formula Weight: 381.5
Appearance: white solid
Purity: 98%

Sphingolipid metabolites, ceramide, sphingosine, and sphingosine-1-phosphate (S1P) are a class of lipid second messengers that regulate calcium mobilization, activation of phospholipase D, tyrosine phosphorylation on p125 (FAK), cell growth and survival. Various stimuli, including PDGF, activation of protein kinase C and cross-linking of the FcεRI receptor by antigens, increase cellular levels of S1P by activation of sphingosine kinase.[1,2] EDG-1, the receptor for S1P, binds S1P with high affinity (dissociation constant of 8.1 nM) and high specificity. In addition to signaling via EDG-1/S1P, S1P signals intracellularly to regulate cellular proliferation, cytotoxicity and suppression of apoptosis.[2,3]

Dihydrosphingosine-1-phosphate (dihydro-S1P) is a synthetic, structurally related, saturated analog of S1P. *In vitro* experiments with human embryonic kidney 293 fibroblasts stably expressing FLAG epitope-tagged Edg-1 (HEK293edg-1) showed dihydro-S1P blocked binding of [^{32}P]S1P to EDG-1/S1P in a dose-dependent manner as potently as did unlabeled S1P (K_i = 15 nM). However, dihydro-S1P had no effect on such events as mitogenesis or prevention of apoptosis and cytotoxicity, which are the result of intracellular signal transduction by S1P. Therefore, dihydro-S1P may be used as a negative control for intracellular studies of S1P signaling.[3]

Similar to S1P, dihydro-S1P enhances chemotaxis in human umbilical vein endothelial cells (HUVEC) which express the S1P receptor EDG-1.[4] Dihydro-S1P is also a ligand for other S1P receptors, including EDG-3.[5]

To view a full line of sphingolipids visit our web site at www.sigma-aldrich.com

Preparation Instructions
The following instructions are for preparing a solution of dihydro-S1P suitable for delivery to cells.

1. Dissolve dihydro-S1P in 60% methanol/30% tetrahydrofuran/10% water to a final concentration of 0.5 mg/ml.
   Note: This may require boiling (75 °C), with occasional replacement of evaporated methanol. Crushing of solid and stirring during heating is recommended.
2. Aliquot desired amounts of stock solution to tubes.
3. Evaporate the solvent with a stream of nitrogen, swirling to deposit a thin film of dihydro-S1P on the inside of the tube.
4. To prepare a working solution, dissolve the film prepared in step 3 using a 4 mg/ml BSA solution (fatty acid free Bovine Serum Albumin in water; 37 °C, 30 min. with repeated vortexing).
   A working solution of 125 µM dihydro-S1P (47.7 µg/ml) is typically recommended.
   Note: The product is not sterile.

Storage/Stability
The product may be stored at –20 °C for up to twelve months. Aliquots prepared in step 3 above may be stored at –20 °C

References
1. Ohanian, J. and Ohanian, V., Sphingolipids in mammalian cell signaling., Cell Mol. Life Sci., **58**, 2053-2068 (2001).
2. Yatomi, Y., et al., Sphingosine 1-phosphate as a major bioactive lysophospholipid that is released from platelets and interacts with endothelial cells, Blood, **96**, 3431-3438 (2000).
3. Van Brocklyn, J. R. et al., Dual actions of sphingosine-1-phosphate: extracellular through the Gi-coupled receptor EDG-1 and intracellular to regulate proliferation and survival. J. Cell. Biol., 142, 229-240 (1998).

4. Wang, F., et al., Sphingosine 1-phosphate stimulates cell migration through a G_i-coupled cell surface receptor. Potential involvement in angiogenesis. J. Biol. Chem., **274**, 35343-35350 (1999).

5. Van Brocklyn, J. R. et al., Sphingosine 1-phosphate-induced cell rounding and neurite retraction are mediated by the G protein-coupled receptor H218. J. Biol. Chem., **274**, 4626-4632 (1999).

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