

# PRODUCT DATA SHEET

## D-erythro-Sphingosine-1-phosphate

**Catalog No:** 1803

**Common Name:** S-1-P

**Source:** synthetic

**Solubility:** chloroform/methanol/40%  
dimethylamine, 5:15:3, 1 mg/ml;  
chloroform plus a few drops of TFA

**CAS No:** 26993-30-6

**Molecular Formula:** C<sub>18</sub>H<sub>38</sub>NO<sub>5</sub>P

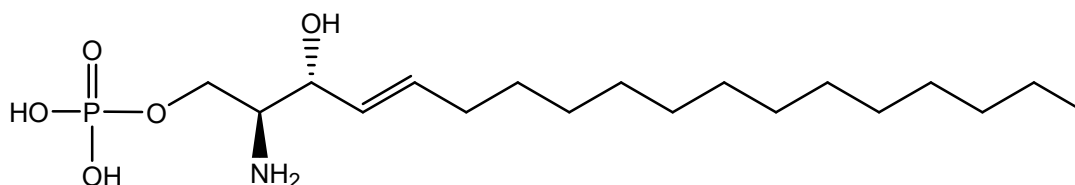
**Molecular Weight:** 379

**Storage:** -20°C

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

**TLC System:** n-butanol/DI water/ammonium  
hydroxide/methanol,  
(40:10:10:10 by Vol.)

**Appearance:** Solid



### Application Notes:

D-erythro-Sphingosine-1-phosphate, the natural isomer, has important signaling functions both intra- and inter- cellularly and is present at low concentrations in cells. It can promote cellular division, regulate calcium mobilization and cell growth, and can either inhibit or promote apoptosis depending on the circumstances.<sup>1</sup> In the metabolism of sphingosine-1-phosphate, sphingosine is first released from ceramides by the enzyme ceramidase and is then phosphorylated by sphingosine kinase. Sphingosine-1-phosphate can then be cleaved by the enzyme sphingosine-1-phosphate lyase to yield *trans*-2-hexadecenal, which can be further catabolized or reduced to sphingosine and this is the means by which sphingolipids are removed from cells.<sup>2</sup> Unlike most other sphingolipids it does not form lipid rafts in membranes and is found in the low nanomolar range in cells. However, in plasma, it can reach a much higher concentration and is stored in relatively high concentrations in human platelets and erythrocytes. Sphingosine-1-phosphate exerts its extra-cellular effects by acting as a ligand for specific receptors. These ligand-receptor interactions are important for the growth of new blood vessels, vascular maturation, cardiac development and immunity, the inflammatory process, and for directed cell movement.<sup>3</sup> Sphingosine-1-phosphate and its receptors may also be involved in regulating heart rate, blood flow in the coronary artery and blood pressure. It is an indicator for certain types of cancer, probably due to its role in cell division and proliferation and is abundant in malignant tissues. Therefore it is undergoing much scrutiny in the attempt to understand the development of these cancers and to investigate therapeutic interventions such as inhibiting its biosynthesis from ceramide. Sphingosine-1-phosphate is involved in regulating the proliferation, survival, differentiation and migration of many types of stem cells, especially in the development of the vascular and nervous systems.

### Selected References:

1. M. Maceyka, S. Milstien, and S. Spiegel "Sphingosine-1-phosphate: the Swiss army knife of sphingolipid signaling" *Journal of Lipid Research*, Vol. 50 pp. S272-S276, 2009
2. S. Alvarez, S. Milstien, S. Spiegel "Autocrine and paracrine roles of sphingosine-1-phosphate" *Trends Endocrinol. Metab.*, Vol. 18 pp. 300-307, 2007
3. J. Nofer "High-density lipoprotein, sphingosine-1-phosphate, and atherosclerosis" *J. Clin. Lipidology*, Vol. 2 pp. 4-11, 2008

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