

PRODUCT DATA SHEET

L-threo-Sphingosylphosphorylcholine

Catalog number: 1319

Common Name: L-threo-SPC

Source: semisynthetic, bovine buttermilk

Solubility: chloroform/methanol, 2:1

CAS number: 105615-55-2

Molecular Formula: C₂₃H₄₉N₂O₅P

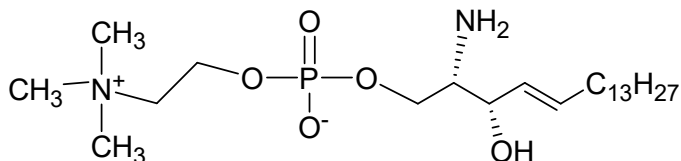
Molecular Weight: 465

Storage: -20°C

Purity: TLC >98%; identity confirmed by MS

TLC System: chloroform/methanol/DI water/
ammonium hydroxide (60:40:7:3
by vol.)

Appearance: solid



Application Notes:

This product is the highly purified L-threo-sphingosylphosphorylcholine isomer which has distinct functionality from the natural D-erythro isomer. SPC is similar in structure to sphingosine-1-phosphate and *lyso*-phosphatidylcholine and has at least low-binding affinity to some of the same receptors such as the sphingosine-1-phosphate receptor. SPC is a bioactive lipid that acts as an intracellular and extracellular signalling molecule in numerous biological processes and activates various signaling cascades. Some of these signaling responses include vasoconstriction, vasodilation, angiogenesis, stress fiber formation, cytoskeletal rearrangements, proliferation, differentiation, migration, wound healing, and stimulation of DNA synthesis. SPC can also inhibit the growth of various cell types, mostly that of tumor cells causing much interest in its possible role as an anti-tumor therapy. SPC is a high-affinity ligand for the orphan receptor ovarian cancer G-protein-coupled receptor 1 (OGR1). The specific binding of SPC to OGR1 also activates p42/44 mitogen-activated protein kinases (MAP kinases) and inhibits cell proliferation.¹ SPC acts as an inhibitor for calmodulin, a highly prevalent intracellular calcium sensor in eukaryotic cells.² The extracellular effects of SPC appear to be stereospecific while intracellular effects are not. D-erythro-SPC, but not L-threo-SPC, stereoselectively stimulate an increase in calcium concentration and cellular proliferation.³ Both the L-threo SPC isomer and the D-erythro SPC isomer can act as second messengers by releasing calcium from internal stores.

Selected References:

1. Y. Xu et al. "Sphingosylphosphorylcholine is a ligand for ovarian cancer G-protein-coupled receptor 1" *Nature Cell Biology*, Vol. 2:5 pp. 261-267, 2000
2. E. Kovacs and K. Liliom "Sphingosylphosphorylcholine as a novel calmodulin inhibitor" *Biochemical Journal*, vol. 410(2) pp. 427-437, 2008
3. E. Jeon et al. "Sphingosylphosphorylcholine induces proliferation of human adipose tissue-derived mesenchymal stem cells via activation of JNK" *Journal of Lipid Research*, vol. 47, pp. 653-664, 2006

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