Product Information

**d-erythro-Ceramide C8 1-Phosphate**

Catalog Number **C8355**

Storage Temperature –20 °C

[Chemical structure image]

**Product Description**

Molecular Formula: C_{26}H_{52}NO_{6}P

Molecular Weight: 505.67

Ceramides comprise a group of cellular lipids characterized by a sphingoid base, most commonly sphingosine, linked to a fatty acid by means of an amide linkage. Ceramides are formed from the breakdown of sphingomyelin by sphingomyelinases with the concomitant release of phosphocholine.\(^1\) Ceramides may be further metabolized to sphingosine and a free fatty acid by ceramidase.\(^2\) Sphingosine and ceramides can also be phosphorylated at C1 by intracellular sphingosine kinases. Alternatively, ceramides can be glycosylated at C1 to form gangliosides and globosides. A ceramide can also be formed directly from sphingosine by the action of ceramide synthase or from sphinganine by sphinganine N-acyltransferase via an inactive dihydroceramide intermediate that is subsequently dehydrogenated by dihydroceramide desaturase.\(^3,4\) The inactive saturated intermediate may be used as a negative control for the corresponding active ceramide.\(^5\) The activity of dihydroceramide desaturase depends on the alkyl chain length of the sphingoid base (C_{18}>C_{12}>C_{8}) or of the ceramide fatty acid (C_{8}>C_{18}) and on the stereochemistry (the d-erythro isoform is ten times more active than the L-threo isoform).

Synthetic ceramides may form four stereoisomers, **d-erythro**, **d-threo**, **L-erythro**, and **L-threo**, of which only the **d-erythro**-ceramide occurs in nature. The sphingoid base usually contains an 18-carbon chain that is hydroxylated on C1 and C3, amidated on C2, and has a single **trans** double bond linking C4 and C5. Synthetic ceramides having a **cis** double bond have been produced. Dihydroceramides have a saturated sphingoid base. Phytoceramides occur in yeast and have a saturated sphingoid base with a third hydroxyl group. Ceramides are further classified based on the chain length and saturation of the fatty acid moiety. Thus, ceramide C6 is hexanoic acid attached to sphingosine by an amide linkage.

Ceramides are generated in response to cellular stimulation by hormones, inflammatory cytokines, FAS ligands, and chemotherapeutic agents, and act as intracellular second messengers in these pathways.\(^6-8\) In many cell types ceramides, like sphingosine, inhibit cell growth and proliferation, activate caspases, and induce DNA fragmentation and cell cycle arrest. Ceramides also block the nuclear translocation of Akt1.\(^9\) In contrast, phosphorylated ceramides tend to stimulate DNA synthesis and cell division.\(^10,11\) The development of synthetic, cell permeable ceramide and ceramide phosphate analogs has opened new avenues for studying the biological functions of the various ceramide isoforms.

**d-erythro-ceramide C8 1-phosphate** is cell permeable and stimulates DNA synthesis in cultured fibroblasts at 5 µM. This mitogenic activity is antagonized by cell permeable ceramidases.\(^11\)

**Preparation Instructions**

**d-erythro-ceramide C8 1-phosphate** is soluble in DMSO at 15 mg/ml and in ethanol at 20 mg/ml.

**Storage/Stability**

Store the product tightly sealed at –20 °C.
References