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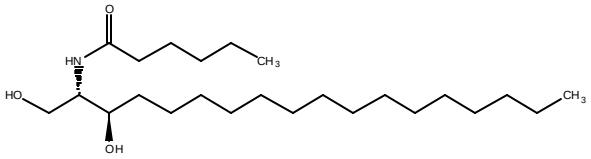
ProductInformation

C6–DIHYDROCERAMIDE

Product Number **C 8230**
Storage Temperature -20 °C

Synonyms: N–Hexanoyl-D-*erythro*-dihydrosphingosine



Product Description

Molecular Formula: $C_{24}H_{49}NO_3$
Molecular Weight: 399.7

Supplied as a white waxy solid
Purity: 98%

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] Ceramide may be further metabolized to sphingosine and a free fatty acid by ceramidase.[2] Sphingosine and ceramide can also be phosphorylated at C_1 by intracellular sphingosine kinases. Alternatively ceramide can be glycosylated at C_1 to form gangliosides and globosides. 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 saturated intermediates are inactive forms and may be used as negative controls for the corresponding active form of 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 D-*erythro*-ceramide occurs in nature. The sphingoid base usually comprises an 18-carbon chain that is hydroxylated on C_1 and C_3, amidated on C_2, and has a single *trans* double bond linking C_4 and C_5. 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, C6 ceramide 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, phosphoryated 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.

C6 dihydroceramide is hydrogenated at C_4 and C_5. It is biologically inactive *in vitro* and *in vivo* and is used as a negative control in studies of the activity C6 ceramide.[5]

Storage/Stability

Store at –20 °C tightly sealed for up to 12 months.

Preparation Instruction

C6 dihydroceramide is soluble in DMF at 25 mg/ml, DMSO at 5 mg/ml, and ethanol at 10 mg/ml.

References

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