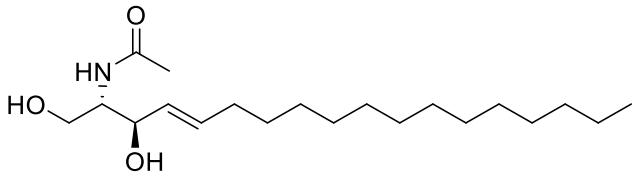
PRODUCT DATA SHEET

N-Acetyl-D-*erythro*-sphingosine

Catalog number: 1901
Common Name: N-C2:0-D-*erythro*-Ceramide
Source: synthetic
Solubility: chloroform, ethanol, methanol, DMSO (up to 5 mg/ml)
CAS number: 3102-57-6
Molecular Formula: $C_{20}H_{39}NO_3$

Molecular Weight: 342
Storage: -20°C
Purity: TLC >98%; GC >98%; identity confirmed by MS
TLC System: chloroform/methanol (90:10 by vol.)
Appearance: solid



Application Notes:

This product contains a short-chain fatty acid and enters easily into cells where it is biologically active and has been shown to induce downregulation of Bcl-2 protein, inhibiting cell proliferation and inducing apoptosis.[1] N-Acetyl-sphingosine demonstrates many of the biological activities associated with ceramides that contain long-chain fatty acids. However, it has also been found that N-acetyl-sphingosine may inhibit neutrophil superoxide release,[2] stimulation of DNA synthesis, and phospholipase D activity. N-acetyl-sphingosine is different from sphingosine as seen by its inability to inhibit protein kinase C or cause calcium release. Ceramide functions as a precursor in the synthesis of sphingomyelin, glycosphingolipids, and of free sphingosine and fatty acids. The sphingosine can be phosphorylated to form sphingosine-1-phosphate. Two of ceramide's metabolites, sphingosine-1-phosphate and glucosylceramide, produce cell proliferation and other cellular functions.[2] Ceramide exerts numerous biological effects, including induction of cell maturation, cell cycle arrest, terminal cell differentiation, cell senescence, and cell death.[3] Because of these effects ceramide has been investigated for its use in cancer treatment and many potential approaches to cancer therapy have been presented.[4] Other effects include producing reactive oxygen in mitochondria (followed by apoptosis) and stimulating phosphorylation of certain proteins (especially mitogen activated protein). It also stimulates some protein phosphatases (especially protein phosphatase 2A) making it an important controller of protein activity. 2-hydroxy fatty acid ceramides are especially abundant in nervous and epidermal cells and are important for the permeability barrier function of epidermis and the lipid organization in membranes. The 2-hydroxylation is catalyzed by fatty acid 2-hydroxylase (FA2H or fatty acid *alpha*-hydroxylase).

Selected References:

1. N. Di Nardo et al. "Ceramide 2 (N-acetyl sphingosine) is associated with reduction in Bcl-2 protein levels by Western blotting and with apoptosis in cultured human keratinocytes" *British Journal of Dermatology*, Vol. 143 pp. 491-497, *2000*
2. K. Wong, X. Li, N. Hunchuk "*N*-Acetylsphingosine (C_2-ceramide) Inhibited Neutrophil Superoxide Formation and Calcium Influx" *Journal of Biological Chemistry*, Vol. 270 pp. 3056-3052, *1995*
3. N. S. Radin, "Killing tumours by ceramide-induced apoptosis: a critique of available drugs" *Biochemical Journal*, Vol. 371 pp. 243-256, *2003*
4. N. S. Radin, "Designing anticancer drugs via the achilles heel: ceramide, allylic ketones, and mitochondria" *Bioorganic and Medicinal Chemistry*, Vol. 11(10) pp. 2123-2142, *2003*

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