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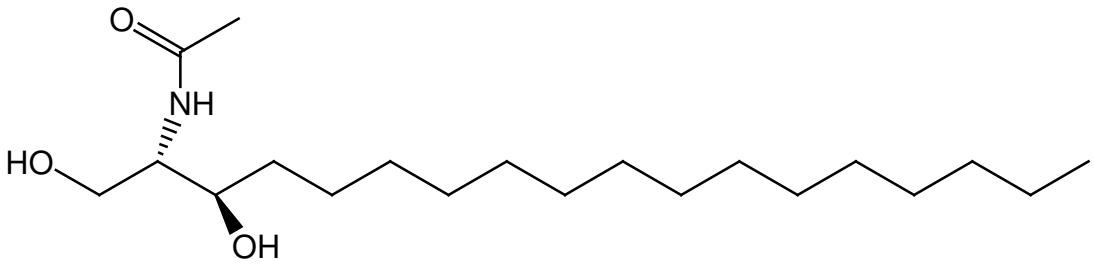
PRODUCT DATA SHEET

N-Acetyl-D-*erythro*-dihydrosphingosine

Catalog number: 1834
Common names: N-Acetyl-D-*erythro*-sphinganine; N-C2:0-D-*erythro*-Dihydroceramide
Source: synthetic
Solubility: chloroform, ethanol, methanol
CAS number: 13031-64-6

Molecular Formula: $C_{20}H_{41}NO_3$
Molecular Weight: 344
Storage: -20°C
Purity: TLC: 98%, GC >98%; identity confirmed by MS
TLC System: chloroform/methanol (90:10)
Appearance: solid



Application Notes:

N-Acetyl-D-*erythro*-dihydrosphingosine is a non-natural analog of the ceramide precursor dihydroceramide. This acetyl dihydroceramide has properties and functions that are different from natural dihydroceramide and is therefore a useful tool for studying dihydroceramides and ceramides. Whereas short chain ceramides potently induce apoptosis in cells neither short nor long-chain dihydroceramides are able to do so.[1] N-Acetyl-dihydroceramide has been shown to be incorporated into mitochondria membranes at the same rate as N-acetyl-ceramide and at a greater rate than N-palmitoyl-ceramide. This demonstrates that both dihydroceramide and ceramide insert into the mitochondrial membrane at the same rate indicating that the inability of dihydroceramide to induce apoptosis is not due to a lack of its insertion into the membrane.[2] The presence of the 4–5 *trans* double bond is essential for ceramide-channel formation. Dihydroceramides are unable to form these ceramide-channels due to their lack of a 4-5 double bond and it is suggested that this is the reason for its lack of apoptotic activity.[3] Natural dihydroceramide is a critical intermediate in the synthesis of many complex sphingoid bases. Inhibition of dihydroceramide synthesis by some fungal toxins that have a similar structure causes an increase in dihydrosphingosine and dihydrosphingosine-1-phosphate and a decrease in other sphingolipids leading to a number of diseases including oesophageal cancer. N-(4-Hydroxyphenyl) retinamide (4-HPR) has been tested as an anti-cancer agent. It inhibits the dihydroceramide desaturase enzyme in cells resulting in a high concentration of dihydroceramide and dihydro-sphingolipids and this is thought to be the cause of the anti-cancer effects.[4]

Selected References:

1. F. Bi et al. "A Conserved Cysteine Motif Is Critical for Rice Ceramide Kinase Activity and Function" PLoS ONE 6(3): e18079. doi:10.1371/journal.pone.0018079, *2011*
2. L. Siskind et al. "Ceramide forms channels in mitochondrial outer membranes at physiologically relevant concentrations" *Mitochondrion*, vol. 6 pp. 118-125, *2006*
3. T. Goldkorn et al. "H2O2 acts on cellular membranes to generate ceramide signaling and initiate apoptosis in tracheobronchial epithelial cells" *Journal of Cell Science*, vol. 111 pp. 3209-3220, *1998*
4. W. Zheng "Fenretinide increases dihydroceramide and dihydrosphingolipids due to inhibition of dihydroceramide desaturase" Georgia Institute of Technology, *2006*

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