

# 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/methanol (5:1), ethanol, methanol

**CAS number:** 13031-64-6

**Molecular Formula:** C<sub>20</sub>H<sub>41</sub>NO<sub>3</sub>

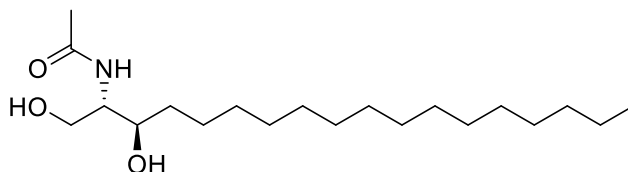
**Molecular Weight:** 344

**Storage:** -20°C

**Purity:** TLC: 98%, GC >98%; identity confirmed by MS

**TLC System:** chloroform/methanol (90:10 by vol.)

**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.<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup>

### 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. "H<sub>2</sub>O<sub>2</sub> 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 dihydro-sphingolipids due to inhibition of dihydroceramide desaturase" *Georgia Institute of Technology*, 2006

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