

PRODUCT DATA SHEET

Phytosphingosine

Catalog number: 1330

Common Name: 4-Hydroxysphinganine

Source: natural, yeast (*Pichia ciferri*)

Solubility: ethanol, methanol,
chloroform/methanol (2:1 by vol.,
warm)

CAS number: 554-62-1

Molecular Formula: C₁₈H₃₉NO₃

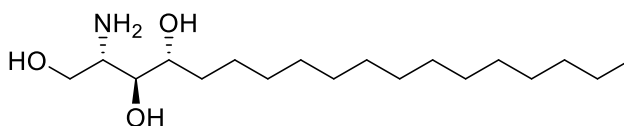
Molecular Weight: 318

Storage: -20°C

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

TLC System: chloroform/methanol/DI
water/2.5N ammonium
hydroxide (60:40:7:3 by vol.)

Appearance: solid



Application Notes:

Phytosphingosine is a long-chain sphingoid base having important cellular functions such as signaling, cytoskeletal structure, cellular cycle, and heat stress response. It is found largely in mammals, plants, and yeast. Phytosphingosine has important cellular signaling roles and is a lipid activator of Pkh1, a protein kinase that regulates Ypk1, Ypk2, and Pkc1 which control cell wall integrity, growth, and other processes. Phytosphingosine thereby controls the activity of other kinases by activating Pkh1 but can also directly activate and phosphorylate kinases such as Sch9, Ypk1, and Ypk2.¹ Phytosphingosine has seen much use in cosmetics due to its effects on the skin such as reducing inflammation by inhibiting the expression of the allergic cytokines IL-4 and TNF- α and the activation of the transcription factors NF- κ B and c-jun in histamine-stimulated skin tissues.² Phytosphingosine can lead to apoptosis via two distinct pathways and has been investigated as a possible cancer therapeutic treatment.³ Phytosphingosine has also been shown to inhibit cellular growth, at least in some bacteria.⁴

Selected References:

1. K. Liu et al. "The Sphingoid Long Chain Base Phytosphingosine Activates AGC-type Protein Kinases in *Saccharomyces cerevisiae* Including Ypk1, Ypk2, and Sch9" *Journal of Biological Chemistry*, Vol. 280(24) pp. 22679, 2005
2. K. Ryu et al. "Anti-scratching Behavioral Effects of N-Stearoylphytosphingosine and 4-Hydroxysphinganine in Mice" *Lipids*, Vol. 45 pp. 615-618, 2010
3. M. Park et al. "Suppression of Extracellular Signal-related Kinase and Activation of p38 MAPK Are Two Critical Events Leading to Caspase-8- and Mitochondria-mediated Cell Death in Phytosphingosine-treated Human Cancer Cells" *Journal of Biological Chemistry*, Vol. 278, pp. 50624-50634, 2003
4. N. Chung et al. "Phytosphingosine as a Specific Inhibitor of Growth and Nutrient Import in *Saccharomyces cerevisiae*" *Journal of Biological Chemistry*, Vol. 276 pp. 35614-35621, 2001

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