

## PRODUCT DATA SHEET

## N-Hexanoyl-biotin-phytosphingosine

Catalog number: 2211

**Synonyms:** N-C6:0-biotin-Phytoceramide **Source:** semisynthetic (*Pichia ciferri*) **Solubility:** chloroform/methanol 2:1, DMF

CAS number: N/A

**Molecular Formula:** C<sub>34</sub>H<sub>64</sub>N<sub>4</sub>O<sub>6</sub>S

**Molecular Weight: 657** 

Storage: -20°C

Purity: TLC >98%, HPLC >98%, identity

confirmed by MS

TLC System: chloroform/methanol 80:20

Appearance: solid

## **Application Notes:**

This phytoceramide analogue contains a biotin unit attached to the amine of the phytosphingosine moiety via a hexanoic acid linker and is ideal for use in sphingolipid studies. The biotin structure allows for attachment of the ceramide to streptavidin and avidin making it extremely useful for binding to substrates and for toxin detection<sup>1</sup>.

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 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-jB and c-jun in histamine-stimulated skin tissues.<sup>2</sup> Phytosphingosine can lead to apoptosis via two distinct pathways and has been investigated as a possible cancer therapeutic treatment. Phytoceramides (fatty acid acylated to Phytosphingosine) are distributed at the microvillous membrane of the epithelial cells of the small intestine. Crypt cells and the adjacent epithelial cells produce phytosphingoglycolipids in much greater quantities than more differentiated epithelial cells.<sup>3</sup> The kidney and skin also contain phytosphingoglycolipids although in much lower concentrations than in the small intestine. Phytoceramides form part of the water barrier lipids of the skin. 2-hydroxytetracosanoyl-phytoceramide has recently been shown to have immunostimulating effects in humans.<sup>4</sup> Phytoceramides have lately been studied in regards to their role in the central nervous system and have been found to have important functions in neuroprotection.<sup>5</sup>

## **Selected References:**

- 1. A. Mukhopadhyay et al. "Direct interaction between the inhibitor 2 and ceramide *via* sphingolipid-protein binding is involved in the regulation of protein phosphatase 2A activity and signaling" *FASEB*, Vol. 23(3) pp. 751-763, 2009
- 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. F. Omae et al. "DES2 protein is responsible for phytoceramide biosynthesis in the mouse small intestine" *Journal of Biochemistry*, vol. 379 pp. 687-695, 2004
- M. Sekiya et al. "A phytoceramide analog stimulates the production of chemokines through CREB activation in human endothelial cells" Int Immunopharmacol., vol. 11 pp. 1497-503, 2011
- J-C. Jung et al. "Phytoceramide Shows Neuroprotection and Ameliorates Scopolamine-Induced Memory Impairment" Molecules, vol. 16 pp. 9090-9100, 2011

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