

## PRODUCT DATA SHEET

### D,L-threo-PDMP

**Catalog No:** 1719

**Common Name:** D,L-threo-1-Phenyl-2-decanoylamino-3-morpholino-1-propanol • HCl

**Source:** synthetic

**Solubility:** ethanol, methanol, chloroform,

DMSO

**CAS No:** 80938-69-8

**Molecular Formula:** C<sub>23</sub>H<sub>38</sub>N<sub>2</sub>O<sub>3</sub> • HCl

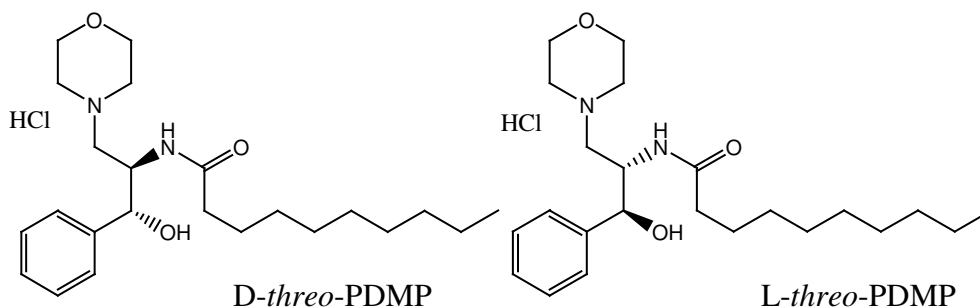
**Molecular Weight:** 391 + HCl

**Storage:** -20°C

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

**TLC System:** chloroform/methanol/acetic acid  
(90:10:10 by Vol.)

**Appearance:** solid



### **Application notes:**

This product is a glucosylceramide synthase inhibitor, an enzyme that is essential for the synthesis of a very large number of different glycolipids that are found in many organisms.<sup>1</sup> PDMP has four possible isomers due to its two chiral centers (*D-threo*, *L-threo*, *D-erythro*, and *L-erythro*). This product (*D,L-threo*-PDMP) is a mixture of *D-threo* (1*R*,2*R*) and *L-threo* (1*S*,2*S*). The *D-threo* isomer has been shown to be the active glucosyl ceramide synthetase inhibitor.<sup>2</sup> However, treatment with the *L-threo* isomer has been shown to contribute to an increase in the amount of lactosyl ceramide and may have other effects as well.<sup>3</sup> Due to PDMP's ability to inhibit the joining of ceramides with carbohydrates there can be an accumulation of ceramide in the cells and this can lead to apoptosis. This process has been suggested as a treatment for cancer.<sup>4</sup> In addition to its stereochemistry, the acyl chain of PDMP has a very marked effect on the intensity of the inhibitory action of the molecule. Conduritol *beta* epoxide (CBE), an inhibitor of *beta*-glucosidase, and 1-phenyl-2-decanoylamino-3-morpholino-1-propanol (PDMP), an inhibitor of glucosylceramide synthase, can be used to create a model of Gaucher disease and consequently an accumulation of glucopsychosine.<sup>5</sup>

### **Selected References:**

1. R. Vunnam, N. Radin "Analogues of ceramide that inhibit glucocerebrosidase synthetase in mouse brain" *Chem Phys Lipids*, Vol. 26(3) pp. 265-278, 1980
2. N. Radin et al. "Effects of *D-threo*-PDMP, an inhibitor of glucosylceramide synthetase, on expression of cell surface glycolipid antigen and binding to adhesive proteins by B16 melanoma cells" *Journal of Cellular Physiology*, Vol. 141(3) pp. 573-583, 1989
3. J. Inokuchi, S. Usuki and M. Jimbo "Stimulation of Glycosphingolipid Biosynthesis by *L-threo*-1-Phenyl-2-Decanoylamino-1-Propanol and Its Homologs in B16 Melanoma Cells" *J. Biochem*, Vol. 117(4) pp. 766-773, 1995
4. N. Radin, et al. "Structural and stereochemical studies of potent inhibitors of glucosylceramide synthase and tumor cell growth" *Journal of Lipid Research*, Vol. 36 pp. 611-621, 1995
5. D. Sillance et al. "Glucosylceramide modulates membrane traffic along the endocytic pathway" *Journal of Lipid Research*, Vol. 43 pp. 1837-1845, 2002

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