

PRODUCT DATA SHEET

Main phospholipid (MPL) of *Thermoplasma acidophilum* >95% pure

Catalog No: 1303

Common Name: *beta*-L-Gulopyranosyl-caldarchaetidyl-glycerol

Source: natural, Archaeobacteria

Solubility: chloroform/methanol (2:1)
hexane/2-propanol/DI water,
(30:40:5)

CAS No: N/A

Molecular Formula: C₉₅H₁₈₈O₁₆P

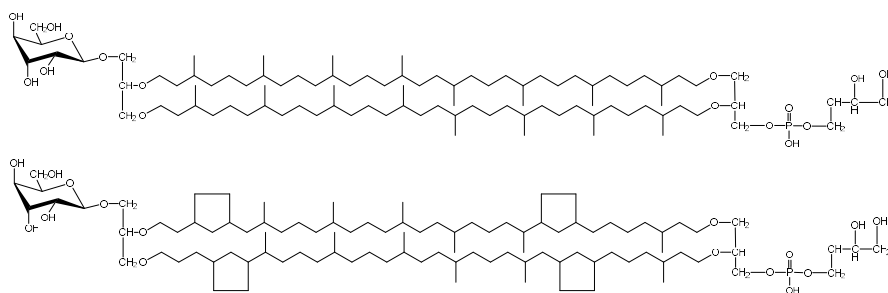
Molecular Weight: 1633/1681

Storage: 4-8°C

Purity: TLC >95%, HPLC >95%

TLC System: chloroform/methanol/ DI water
(80:25:3 by vol.)

Appearance: solid



Application Notes:

This product is a tetraether monosaccharide phospholipid of high purity and is the main phospholipid (MPL) of *Thermoplasma acidophilum*. It contains a glycerophosphate and a gulosyl pyranoside monosaccharide linked via a tetraether chain. The MPL is largely responsible for *T. acidophilum*'s ability to survive in low pH (1-2) and high temperatures (55-59°C)¹ and constitutes almost half of the total lipids.² MPL is useful for making liposomes to study various molecular functions.³ It has been found to be valuable in the development and application of model membrane systems on the basis of tetraether lipids as demonstrated by the integral membrane protein alamethicin and the peripheral proteins melittin, valinomycin, and nonactin which interact primarily with lipid head groups and are readily incorporated into the tetraether lipid structures. Growth of various living cell types was not affected by the MPL and when MPL liposomes were injected into mice no pharmacological or toxic effects were detected other than increased behavioural activity. Labeled MPL liposomes were found to be rapidly cleared from the circulation.⁴

Selected References:

1. H. Shimada et al. "Complete Polar Lipid Composition of *Thermoplasma acidophilum* HO-62 Determined by High-Performance Liquid Chromatography with Evaporative Light-Scattering Detection" *Journal of Bacteriology*, Vol. 184:2 pp. 556-563, 2002
2. I. Uda et al. "Characterization of caldarchaetidylglycerol analogs, dialkyl-type and trialkyl-type, from *Thermoplasma acidophilum*" *Lipids*, Vol. 35:10 pp. 1155-1157, 2000
3. H.-J. Freisleben et al. "Reconstitution of bacteriorhodopsin and ATP synthase from *Micrococcus luteus* into liposomes of the purified main tetraether lipid from *Thermoplasma acidophilum*: proton conductance and light-driven ATP synthesis" *Chemistry and Physics of Lipids*, Vol. 78:2 pp. 137, 1995
4. H.-J. Freisleben et al. "Toxicity and Biodistribution of Liposomes of the Main Phospholipid from the Archaeobacterium *Thermoplasma Acidophilum* in Mice" *Journal of Liposome Research*, Vol. 5:1 pp. 215, 1995

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