

PRODUCT DATA SHEET

Phosphatidylinositol, plant, wheat germ (Na⁺ salt)

Catalog No: 1048

Common Name: PI (Na⁺ salt)

Source: natural, plant

Solubility: chloroform, ethyl ether

CAS No: 84776-78-3

Molecular Formula: C₄₅H₇₈O₁₃P • Na

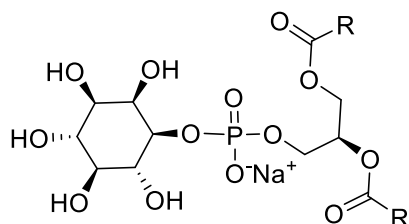
Molecular Weight: 858 + Na (linoleoyl)

Storage: -20°C

Purity: TLC > 98%; identity confirmed by MS

TLC System: chloroform/methanol/DI water/
ammonium hydroxide (65:25:3:3
by vol.)

Appearance: liquid



Application Notes:

The metabolism of inositol lipids is involved in the signal transduction of many hormones, neurotransmitters and growth factors.^{1,2,3} In the classical pathway, phosphatidylinositol-specific phospholipase C (PI-PLC) hydrolyzes phosphatidyl 4,5-bisphosphate (PIP₂) to yield 1,2-diacylglycerol (DAG) and inositol 1,4,5-triphosphate (IP₃). The role of IP₃ and DAG as second messengers is well recognized. In a second, more recently discovered pathway, the activation of phosphoinositide 3-kinase results in the formation of three novel phosphatidyl (PI) lipids phosphorylated at the D3 positions of the inositol ring: PI-3-P, PI-3,4-P₂, and PI-3,4,5-P₃. These D3 lipids are not known substrates for any of the phospholipase C enzymes and function as second messengers. PI 3-kinase activity is correlated with many cellular processes including the regulation of cell growth, oncogenic transformation, chemotaxis and receptor down-regulation. A recent paper on the effect of PI-3,4-P₂ on the Akt proto-oncogene product also contains protocols for applying PIP's to cell cultures.⁴ Matreya's synthetic phosphatidylinositols and inositol phosphates are excellent tools for investigating these second messengers, understanding the enzyme mechanisms involved in phosphoinositide metabolism and designing therapeutic pharmacological agents.

Selected References:

1. Bruce A. Fenderson, E. M. Eddy, Sen-Itiroh Hakomori "Glycoconjugate expression during embryogenesis and its biological significance" *BioEssays* Vol. 12 pp. 173, 1990
2. P.W. Majerus, "Inositol phosphate biochemistry" *Annual Review of Biochemistry* Vol. 61 pp. 225-250, 1992
3. Ao-Lin Hsu, et al. "Novel Function of Phosphoinositide 3-Kinase in T Cell Ca²⁺ Signaling: A Phosphatidylinositol 3,4,5-Trisphosphate-Mediated Ca²⁺ Entry Mechanism" *Journal of Biological Chemistry* May, Vol. 275 pp. 16242-16250, 2000
4. H. Shimamura, et al. "The PI3-kinase-Akt pathway promotes mesangial cell survival and inhibits apoptosis in vitro via NF-kappa B and Bad" *Journal of American Society of Nephrology* Vol. 14 pp. 1427-1434, 2003

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