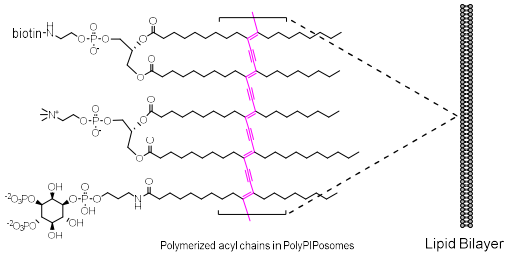
PolyPIPosomes

PolyPIPosomes are polymerized, liposome-like nanoparticles which show markedly increased stability (up to 6 months) vs. conventional liposomes. A biotin tag is incorporated for easy detection of PIP_n-binding proteins with streptavidin reagents or coated surfaces. PolyPIPosomes have been used for studying lipid-protein interactions in pull-down assays, surface plasmon resonance, and ELISAs.

Catalog #	PIP_n	Catalog #	PIP_n
Y-0000	No PIP_n	Y-P034	$PI(3,4)P_2$
Y-P000	PI	Y-P035	$PI(3,5)P_2$
Y-P003	PI(3)P	Y-P045	$PI(4,5)P_2$
Y-P004	PI(4)P	Y-P039	$PI(3,4,5)P_3$
Y-P005	PI(5)P		



Composition: PolyPIPosomes are provided as a 1mM total lipid solution containing 5% PIP in deionized water containing 0.05% sodium azide. The average size of the PolyPIPosomes is 200 nm.

Lipid	Mole %	Concentration (mM) in H_2O
Polymerizable-PC	65	0.65
Polymerizable-PE	29	0.29
Polymerizable-PIP_n	5	0.05
Polymerizable-biotin-PE	1	0.009
		1 mM total lipid
Control PolyPIPosomes (Y-0000): 70% PC, 29% PE, 1% biotin-PE		

Product Appearance: Pale orange solution.

Storage and Handling: PolyPIPosomes are relatively stable at room temperature for short periods of time. For long term storage of up to 6 months, PolyPIPosomes can be stored at 4ºC. **DO NOT FREEZE**. Storage in basic buffers (pH > 9.0) or acidic buffers (pH < 4.0) may cause decomposition.

Selected Applications and References

Pull-down Assays

1) Elkin, S. K., D. Ivanov, et al. (2005). "A PHD finger motif in the C-terminus of RAG2 modulates recombination activity." J Biol Chem **280**(31): 28701-10.

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3) Tiwari, S., H. P. Choi, et al. (2009). "Targeting of the GTPase Irgm1 to the phagosomal membrane via PtdIns(3,4)P(2) and PtdIns(3,4,5)P(3) promotes immunity to mycobacteria." Nat Immunol **10**(8): 907-17.

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6) Mathiowetz, A. J., E. Baple, et al. (2017). “An Amish founder mutation disrupts a PI(3)P-WHAMM-Arp2/3 complex driven autophagosome remodeling pathway” Mol. Biol. Cell. **28**(19), 2492-2507.

Pull-down Assays with Streptavidin Coated Beads

1) Naslavsky, N., J. Rahajeng, et al. (2007). "EHD1 and Eps15 interact with phosphatidylinositols via their EH-domains." J Biol Chem. **282**(22): 16612-22.
2) Sagona, A. P., I. P. Nezis, et al. (2010). "PtdIns(3)P controls cytokinesis through KIF13A-mediated recruitment of FYVE-CENT to the midbody." Nat Cell Biol **12**(4): 362-371.
3) Ueyama, T., J. Nakakita, et al. (2011). "Cooperation of p40(phox) with p47(phox) for Nox2-based NADPH oxidase activation during Fcgamma receptor (FcgammaR)-mediated phagocytosis: mechanism for acquisition of p40(phox) phosphatidylinositol 3-phosphate (PI(3)P) binding." J Biol Chem **286**(47): 40693-705.
4) Tan, X., Y. Sun. (2015). “LAPTM4B is a PtdIns(4,5)P2 effector that regulates EGFR signaling, lysosomal sorting, and degradation” EMBO J. **34**(4): 475-90.
5) Hong, N.H., A. Qi. (2015) “PI(3,5)P2 controls endosomal branched actin dynamics by regulating cortactin-actin interactions” J. Cell. Biol. **210**(5): 753-769.

Floatation Assay (similar to pull-down)

Skwarek, L. C., M. K. Garroni, et al. (2007). "Neuralized Contains a Phosphoinositide-Binding Motif Required Downstream of Ubiquitination for Delta Endocytosis and Notch Signaling." Developmental Cell **13**(6): 783.

ELISA

Burkhead, J. L., C. T. Morgan, et al. (2009). "COMMD1 Forms Oligomeric Complexes Targeted to the Endocytic Membranes via Specific Interactions with Phosphatidylinositol 4,5-Bisphosphate." J Biol Chem **284**(1): 696-707.

Cells

Antony, P., K. Hoek, et al. (2007). "Micro-scale flow cytometry-based and biochemical analysis of lipid signaling in primary B cell subpopulations." Biol Proced Online **9**: 73-83.

Surface Plasmon Resonance (SPR)

1) Meuillet, E. J., S. Zuohe, et al. (2010). "Molecular pharmacology and antitumor activity of PHT-427, a novel Akt/phosphatidylinositide-dependent protein kinase 1 pleckstrin homology domain inhibitor." Mol Cancer Ther **9**(3): 706-17.
2) Ferguson, C. G., R. D. James, et al. (2005). "Phosphoinositide-Containing Polymerized Liposomes: Stable Membrane-Mimetic Vesicles for Protein-Lipid Binding Analysis." Bioconj Chem 16(6): 1475-1483.

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