P005 Role of phosphatidylinositol-3-phosphate in cell signalling

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The lipid products of PI 3-Kinase play a pivotal role in many different physiological events. Among the different PI 3-Kinase products, attention has been focused so far essentially on PtdIns-3,4,5-P_3 whereas PtdIns-3-P has been essentially considered as a lipid constitutively present and restricted to endosomes and intracellular vesicles. We have recently demonstrated that insulin specifically generates a pool of PtdIns-3-P at the level of the lipid rafts subdomain of the plasma membrane that involves the activation of a PI 3-Kinase more resistant to inhibitors than type IA PI 3-Kinase. We then tested whether PtdIns-3-P might have a role in other, different signalling pathways since we have already reported that LPA increases the levels of PtdIns-3-P in COS7 cells. In an effort to better characterise the role of PtdIns-3-P in LPA signalling, we found that this phosphoinositide is generated at the plasma membrane of COS7, HeLa and SKOV3 cells upon LPA stimulation. Furthermore we found that PtdIns-3-P is required for the LPA-induced migration of HeLa and SKOV3 cells. These results give a new insight into the intracellular role of PtdIns-3-P and clearly state that PtdIns-3-P can act as a dynamic lipid second messenger.