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Meeting abstract

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A novel mechanism for the regulation of Gab1 recruitment to the plasma membrane

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Adapter proteins involved in signal transduction fulfil their cellular functions by bringing signalling molecules together and by targeting these signalling components to defined compartments within the cell. Furthermore, adapter proteins represent a molecular platform from which different signalling pathways are initiated. Gab1 is an adapter, which recruits the p85 subunit of the phosphatidylinositol 3-kinase, the adapter Grb2, the adapter and phosphatase SHP2 and the GTPase-activating protein Ras-GAP. By this, Gab1 contributes to the activation of the PI3K cascade and the MAPK cascade by many growth factors and cytokines. The recruitment of Gab1 to phosphatidylinositol-3,4,5-tris-phosphate within the plasma membrane by its pleckstrin homology domain is regarded as a major regulatory step for the activation of Gab1. Here, we present a novel and more complex mechanism for Gab1 translocation, which involves and depends on the activation of ERK. We demonstrate that the presence of PI3K activity in the cell is not sufficient for binding Gab1 to the plasma membrane. Instead, additional MAPK-dependent phosphorylation of serine 551 in Gab1 is crucial for the recruitment of Gab1 to the plasma membrane. This mechanism represents a new mode of regulation for the function of PH domains.