

Mechanism of cell polarization in budding yeast

The establishment of cell polarity is a critical step in the generation of cell shape, cell motility, and asymmetric cell division during diverse developmental and physiological processes. A conserved regulator of cell polarity in eukaryotes is the Rho-family GTPase, Cdc42. Work in the past ten years or so has demonstrated that the establishment of cell polarity to be driven by two coupled mechanisms: one involving actin assembly and actin-based transport, and the other independent of actin but requiring cytosolic chaperoning of Cdc42 by the GDI protein. The resulting polarized state is dynamic and must be maintained through active Cdc42 recycling. The parameters of recycling influence the shape of Cdc42 distribution and morphogenetic outcome. In this presentation, I will discuss our recent results on an unexpected role for membrane diffusion property of Cdc42 in the establishment stable cell polarity.