

Webinar « Cell biology & signal transduction »

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Distribution of two phospholipids defines a dynamic plasma membrane domain for re-orientation of root hair tip growth

Abstract:

Many types of plant cell elongate along the cell polarity axis, and the polarized growth is crucial for morphogenesis and function of specialized cell types. Root hair and pollen tube cells undergo typical polarized growth, in which they extend their tip part forward. Cellular components are actively transported to the tip part along the cytoskeleton. That is highly regulated by many proteins such as small GTPases and lipid metabolic enzymes. In yeast, nematodes and mammals, atypical protein kinase C (aPKC), which belongs to the AGC group of serine/threonine protein kinases, regulates polarity of cells. While there is no plant homolog of aPKC, several members of *Arabidopsis* AGC VIII family, including PID/WAGs and D6PKs, are known to control cell polarity and its related processes such as polar auxin transport. To reveal a relationship between plant AGC kinases and polarized cell growth, we have focused on the molecular species expressed in root hairs. We demonstrate that these kinases localize on dynamic domains of the plasma membrane at the tips of growing root hairs, and that two types of phospholipid are crucial for the localization. We will discuss how these kinases contribute to root hair growth.

