



CDB SEMINAR

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Plant Cell and Developmental Biology

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Wednesday, November 11, 2009

16:00~17:00 A7F Seminar Room

Characterization of microtubule-end structure and γ -tubulin in plants

Summary

How microtubules (MTs) are organized in a cell is one of main topics in cell morphogenesis. Animals and fungi use MT systems initiating from a focused MT organizing center, such as animal centrosomes and spindle pole bodies. In contrast, plant MTs are organized without obvious converging centers. How these plant-specific MT organization systems became established during plant evolution has remained enigmatic. To characterize the transient MT-end structures in plants, we have quantitatively analyzed the architecture of the cortical MT-ends in epidermal cells of high pressure frozen onion cotyledons visualized by dual-axis electron tomography. In animal cells, the minus end of MTs is often capped by a MT-initiating γ -tubulin ring-complex. The γ -tubulin, a conserved MT nucleator protein in animals and yeasts, has been shown to be in the proposed MT nucleation sites of various types of plant MT systems. However, frequency of the capped-end is relatively low in plant MT systems, suggesting that the minus end of plant MT is unstable. As the loss of centrioles occur during the evolution of land plants, we also compared amino acid sequence and the function of γ -tubulin among green plants to characterize plant γ -tubulins. Based on these observations, I will discuss the origin of plant-specific MT initiation systems.

Host:

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