

UGent Doctoral Schools activity: MEET THE EXPERT

Pectin acetylation and plant cell adhesion

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VIB-UGent Center for Plant Systems Biology

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Pectins are enriched in primary cell walls and the middle lamella, determining cell-to-cell adhesion. O-acetylation of pectin backbones influences their physicochemical properties and plays a role in plant development and interactions with the environment. We recently isolated and mapped two trichome birefringence (tbr) mutants from an ozone-sensitivity screen and showed that TBR is required for leaf epidermal cell adhesion. We further demonstrated that TBR is an RG-I rhamnose O-acetyltransferase with an acidic pH optimum, and, through structure-function modelling coupled with biochemical analysis determined the significance of mutated amino acid residues. Notably, TBR utilizes multiple O-acetyl donors, and is able to form acyl-enzyme intermediates in the presence of acetylated pectins, suggesting transacetylase activity. We propose that, in tbr, loss of cell adhesion stems from cell wall modifications triggered by decreased RG-I acetylation during leaf cell proliferation. Together, our data suggest that RG-I O-acetylation affects cell adhesion.

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