Cell Adhesion in Arabidopsis thaliana

Laura Yang, class of 2023

Cellular adhesion plays an important role in plant growth and development and is thought to depend on the synthesis and structure of cell walls. Cell walls primarily consist of cellulose, hemicellulose, and pectin. Pectin is a complex polysaccharide and a major contributor to plant cell adhesion. Hence, plant cells have evolved complex mechanisms to control pectin processes. Within the Golgi, pectins are first made into polymers and then methylated by various pectin biosynthesis enzymes like QUA1, QUA2, and GAUT9. The methylated pectins are then transported inside vesicles and deposited in cell walls and the middle lamella that lies between cells. Pectin methylesterases (PMEs) then demethyl TJ ET Q q 0.00000912 0 612 792 re W* n BT /F3

other ELMO mutants, except ELMO4 is upregulated in the elmo1/2 double mutant The elmo1/2 double mutant has the most severe phenotype of all studied mutants, and it likely needs an upregulation of another ELMO to compensate for the lost.

Besides the gene expression project, I also developed the yeast-two-hybrid assay for my honors project this fall investigating the direct protein-to-protein interaction between ELMOs and pectin biosynthesis enzymes The Kohorn lab has found using co-immunoprecipitation, ELMO1 forms a complex with ELMO4 and three pectin biosynthesis enzymes - QUA1, QUA2, and GAUT9. The results suggest ELMOs act as a scaffold for pectin biosynthesis enzymes. However, it is unclear if ELMOs bind one or all components of this biosynthetic complex. Therefore, we obtained cDNAs for all protein of interest, used PCR and Gibson assembly to clone them into yeast two hybrid vectors I plan to use these to test for direct protein-protein interaction this fall.

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