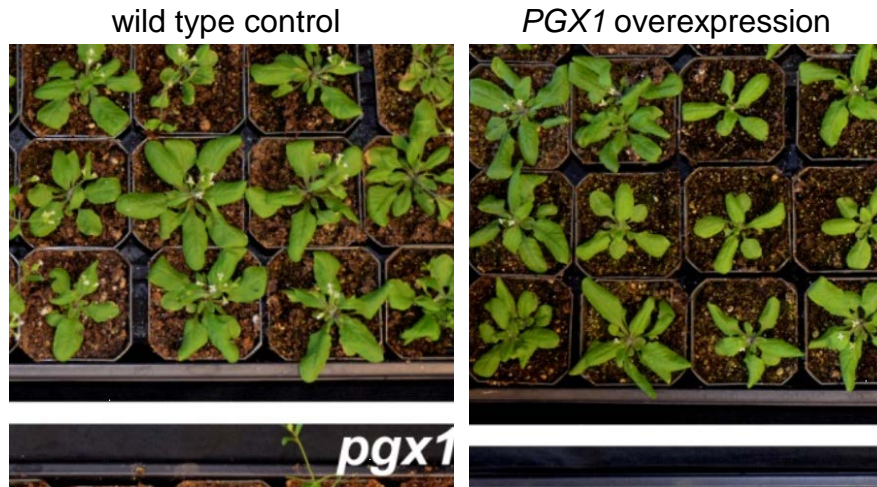


A Plant Polygalacturonase that Degrades Pectin and Modulates Plant Cell Expansion

Scientific Achievement

A genetic method called activation tag screening revealed that the polygalacturonase PGX1 is an enzyme that degrades pectin in the cell wall and can modulate cell expansion and flower development in the model plant species *Arabidopsis thaliana*.



Twenty-five-day-old wild type control (left) and *PGX1* overexpression (right) plants. *PGX1* overexpression plants have significantly larger diameters than wild type controls ($p < 0.05$, one way ANOVA and Tukey test)

Xiao C, Somerville CR, Anderson CT. 2014. *Plant Cell* 26: 1018-1035

Significance and Impact

Polygalacturonases are known to function in cell separation (e.g., leaf shedding) in plants; identification of their additional function in cell expansion makes them attractive targets for engineering plant size and cell-cell adhesion in bioenergy crop species to enhance biomass yield, pathogen resistance, and/or degradability for bioenergy production.

Research Details

- *PGX1* overexpression enhances plant growth.
- Loss of *PGX1* reduces growth in dark-grown seedlings.
- *PGX1* degrades pectin *in vitro* and is located in the plant cell wall.
- *PGX1* activity correlates positively with total polygalacturonase activity and negatively with pectin molecular size in cell walls
- Plants overexpressing or lacking *PGX1* have higher proportions of flowers with extra petals



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