



Heather E. McFarlane
Assistant Professor
Canada Research Chair
in Plant Cell Biology
Department of Cell & Systems Biology
University of Toronto

Plant cell wall signalling and pathways for cell wall synthesis

The plant cell wall is a polysaccharide-based extracellular matrix that surrounds and protects all plant cells. Since plants are constantly growing and developing within the confines of their cell walls, plant cells must be in constant communication with their cell walls. Furthermore, cell walls are a critical line of defense between plant cells and their environment; changes to the cell wall are often early warning signs of pathogen attack or abiotic stress, and plants fortify their cell walls in response to these stresses. This ongoing communication between the plant cells and their cell walls is collectively called “cell wall signaling”. The McFarlane Lab at The University of Toronto studies the molecular mechanisms of cell wall signaling and responses, including cell wall secretion and remodeling. We have recently characterized two different pathways that affect cell wall matrix polysaccharide synthesis at the Golgi apparatus. Interestingly, these cell wall synthesis defects result in changes to Golgi structure and function including inappropriate cell wall synthesis, secretion, and/or remodelling. These cellular phenotypes ultimately result in defects in coordinated cell growth, resulting in dramatic consequences for plant growth and development.