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On the Move: Characterizing Trafficking Genes Whose Expression is Altered in the Cell Wall Mutant *atprp3-1*

For a polarized plant cell to grow in a particular direction it must deposit new membrane and cell wall materials at the apex of growth. Due to the secretion of plasma membrane and ECM at the growing tip, surplus material must be endocytosed. It is well accepted that vesicle trafficking towards and away from the growing tip of root hair is important for maintaining polarity and growth, but little is known about the organization of the cellular components and how these components are involved in maintaining these trafficking pathways. We have identified several genes expressed in arabidopsis root hairs that are sensitive to changes in cell wall organization through the use of microarray analysis. One of these genes is *AtVTI13*, a v-SNARE that is predicted to be involved in vesicle trafficking based on its homology to genes in other eukaryotic systems. Analysis of a T-DNA insertion mutant for *AtVTI13* (*vti13)* has shown that this mutant exhibits aberrant root hair growth in response to varying environmental conditions. Our hypothesis is that the function of VTI13 is associated with trafficking pathways important for polarized growth in root hairs. We have generated a GFP-VTI13 construct that complements the *vti13* mutant phenotypes in transgenic plants. We have found VTI13 localizes to the vacuolar membrane, as well as mobile compartments that are sensitive to Brefeldin A, a known inhibitor of trafficking between certain endocytic compartments. Movement of the VTI13-labeled compartments is dependent on an actin cytoskeleton, further supporting our hypothesis that VTI13 localizes in compartments of endocytic pathways. Current research is focused on identifying the particular compartments between which VTI13 traffics cargo in a manner that is necessary for root hair growth.