

Root hairs are polarized extensions of root epidermal cells and this pattern of growth requires the coordination of both secretory and endosomal trafficking. We are characterizing a novel retromer subunit, VPS26C (AT1G48550), which is required for root hair growth in *Arabidopsis* under conditions of osmotic stress. Retromers are multi-subunit complexes which function in recycling endosomal transmembrane proteins and have been shown to play critical roles in several aspects of plant development. We have shown that *vps26c* mutant alleles exhibit no root hairs or short root hair stubs when grown in presence of 200 mM mannitol. In addition, we have demonstrated that VTI13, a SNARE that functions in trafficking pathways to the vacuole, is a suppressor of the *vps26c* root hair phenotype as *vps26c vti13* double mutants exhibit root hair growth that is indistinguishable from wild type seedlings when grown in presence of mannitol. These data support a model in which VPS26C and VTI13 interact within endosomal trafficking pathways essential for polarized growth under conditions of osmotic stress. Phylogenetic analyses demonstrate that VPS26 sequences are present in early land plants and widely in angiosperms and gymnosperms; however current data suggests that this protein is absent from monocots. RT-PCR analysis shows that VPS26C is expressed at all stages of plant development suggesting that it functions in organs other than root hairs. Current research efforts are focused on identifying endosomal compartments associated with VPS26C during root hair growth. These studies will provide us with a better understanding of retromer function in endocytic pathways that may regulate osmotic stress tolerance in plants.