

## 224. Identification of six Golgi localized bi-functional UDP-Rhamnose/UDP-Galactose transporters in Arabidopsis

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**Project Goals: To determine the mechanisms of cell wall biosynthesis in plants. A better understanding of the metabolic processes responsible for accumulation of polysaccharides in the cell wall will provide tools for engineering of plants with improved properties as biofuel feedstocks.**

Plant cell walls are composed of polysaccharides most of which are synthesized in the Golgi apparatus from nucleotide sugars that are transferred from the cytosol into the Golgi lumen by nucleotide sugar transporters (NSTs). By using a novel approach that combines reconstitution of NSTs into liposomes and subsequent LC-MS/MS analysis of nucleotide sugar uptake, we identified six bi-functional UDP-rhamnose / UDP-galactose transporters. All six transporters are localized in the Golgi. Mutants in URGT1 have reduced galactose in the cell wall whereas overexpressors accumulate up to 50% more galactose than wild-type plants, mainly in the pectin- rich fraction. In contrast, galactose in xyloglucan is unaffected in mutants and overexpressors. Mutants in URGT2 exhibit lower levels of rhamnose and galacturonic acid in seed mucilage, a structure rich in rhamnogalacturonan I while URGT2 overexpressors have no change in leaf cell wall composition. Our results suggest that some NSTs may be channeling nucleotide sugars to specific glycosyltransferases.

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