

P012 A mutation in the sucrose transporter gene *SUC2* leads to changes in metabolic gene expression in *Arabidopsis thaliana*
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In *Arabidopsis* the sucrose-proton symporter, *SUC2* is responsible for the movement of sucrose into the phloem for transport from leaves to other parts of the plant. Molecular analysis of the *Arabidopsis pho3* mutant revealed a single nucleotide change in the gene encoding this transporter. The mutation led to the accumulation of high levels of soluble carbohydrates, providing a tool to investigate the genomic response to sucrose accumulation using microarray analysis. Small but significant decreases were observed in the expression of many genes encoding enzymes and regulatory proteins involved in primary carbon assimilation, suggesting that in mature leaves of *Arabidopsis* there is limited feedback regulation on gene expression by sugars. Levels of Rubisco small subunit mRNA and protein were reduced by 30-50% but chlorophyll fluorescence imaging of seedlings indicated that photosynthesis was not affected. In contrast, notable changes to the expression of some genes involved in plastid carbon metabolism were found, including increases in transcripts for the large subunits of ADP-glucose pyrophosphorylase. The study also revealed a striking increase in expression of the plastid glucose 6-phosphate/phosphate translocator, characteristically expressed only in heterotrophic tissues. This indicated a change in the nature of metabolite exchange between the plastid and cytosol in the *pho3* mutant.