

Insights: Publications

The Arabidopsis sugar-insensitive mutants *sis4* and *sis5* are defective in abscisic acid synthesis and response

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Although soluble sugar levels affect many aspects of plant development and physiology, little is known about the mechanisms by which plants respond to sugar. Here we report the isolation of 13 sugar-insensitive (*sis*) mutants of *Arabidopsis* that, unlike wild-type plants, are able to form expanded cotyledons and true leaves when germinated on media containing high concentrations of glucose or sucrose. The *sis4* and *sis5* mutants are allelic to the ABA-biosynthesis mutant *aba2* and the ABA-insensitive mutant *abi4*, respectively. In addition to being insensitive to glucose and sucrose, the *sis4/aba2* and *sis5/abi4* mutants also display decreased sensitivity to the inhibitory effects of mannose on early seedling development. Mutations in the *ABI5* gene, but not mutations in the *ABI1*, *ABI2* or *ABI3* genes, also lead to weak glucose- and mannose-insensitive phenotypes. Wild-type and mutant plants show similar responses to the effects of exogenous sugar on chlorophyll and anthocyanin accumulation, indicating that the mutants are not defective in all sugar responses. These results indicate that defects in ABA metabolism and some, but not all, defects in ABA response can also alter response to exogenous sugar.