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PETUNIA HYBRIDA IS A MODEL SYSTEM TO DETERMINE THE ROLE OF EXPANSINS IN PLANT ORGAN DEVELOPMENT

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In plants, organ shape is determined by organised and regulated control of cell expansion and division.

The enlargement of the primary cell wall largely determines the expansion pattern and thereby the final shape and size of the cells.

Cell wall proteins are believed to play important roles in regulating cell wall extensibility which is a key parameter determining cell expansion.Expansins are unique in their ability to induce immediate cell wall extension *in vitro* and cell expansion *in vivo*. Studies of expansin gene expression indicate that different expansin genes are expressed in different organs, tissues and cell type, and they respond distinctively to such treatments as hormones, light and pollination.

The reverse genetics approach based on transposon mutagenesis was used to study the function of *Petunia hybrida* expansin genes.

We isolated two insertion alleles: the first in an exon of the PhEXP1 and the second in the promoter region in *Petunia hybrida W138*. The plants with the homozygous insertion of dTph1 transposon element in the exon did not display morphological alterations, whereas the plants with the insertion in the promoter showed morphological alterations affecting the flowers. PhEXP1 expression levels in mutant plants were characterised by Real-Time RT-PCR. In mutant plants we also analysed expression levels of two other expansin genes isolated in *Petunia hybrida:* PHEXP2 and PHEXP3. To improve characterisation of this morphological alteration we transferred the transposon insertion to the promoter region in *Petunia hybrida W115*.