

Title The gladiolus *GgEXP1* is a GA-responsive alpha-expansin gene expressed ubiquitously during expansion of all floral tissues and leaves but repressed during organ senescence

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Abstract

The final shape and size of the flower is genetically and developmentally controlled by tight regulation of cell number and cell size with cell expansion playing an important role. The gladiolus expansin gene, *GgEXP1*, was expressed prominently during phases of active tepal expansion and cell elongation in stamen filaments, gynoecium styles and expanding leaves but not in tissues where expansion had ceased and senescence had been initiated. Within tepals, differential expression between the proximal and distal portions that differ in cell elongation was observed. The expression of the gene was responsive to GA and inhibited by the GA biosynthesis inhibitor, paclobutrazol. The promoter of *GgEXP1* showed strong expansion-responsive GUS expression in young agro-infiltrated gladiolus tepals and in etiolated hypocotyls and light grown expanding cotyledonary leaves of transgenic *Arabidopsis* seedlings. Inhibition of hypocotyl elongation by paclobutrazol blocked the expression of the promoter-driven reporter gene indicating GA responsiveness of the promoter. *GgEXP1* provides an interesting example of a single expansin gene being involved in expansion processes in different plant tissues such as tepals, stamens, pistils and leaves that are both spatially as well as temporally distinct in their development. The studies provide a basis for GA mediated expansion of floral organs via expansins prior to anthesis.