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Analysis of expression pattern and activity of tissue-specific promoter from Acapulco lily (*Lilium hybrid cv. 'Acapulco'*) using -glucuronidase (GUS)

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Genomic clone *gALCHS7* encoding protein ALCHS2, which is believed to be the major constituents of flower pigmentation (anthocyanins) in lily, was isolated and reported previously. Promoter region in *gALCHS7* was fused to the -glucuronidase in pBI101, and was introduced to petunia ('Dream Red') by Agrobacterium-mediated transformation. A total of ten putative transgenic plants showed localized GUS activity in anther, and five of them also showed weak GUS activity in ovule. To determine the operation of promotor region clearly, we conducted microscopic analysis of temporal and spatial expression in transgenic tissues. At bud stage of 1 cm in size, a weak GUS expression in pistil was observed only in line 6. Non-transgenic plant and transgenic line 18 were not any GUS signal. But before anthesis, GUS was highly expressed in pollen, endothethium, and epidermis in all lines. From the microscopic observation, no distinctive signal in leaf and petal was detected in all satge. Fluorometric GUS assays of individual organs taken from four transgenic plants demonstrated that line 6 showed highest GUS activity in anther. Line 34 showed lowest activity in anther but relatively high activity in pistil. Line 37 exhibited middle level activity in anther, pistil, and ovule. Approximately, the activity controlled by the introduced promoter was higher than that of 35S CaMV promoter (pBI121) by 1.5 to 3 folds. The results suggested that this tissue-specific promoter operates mainly in reproductive organs, and the activity was higher than 35S CaMV promoter. To search a defined tissue-specific element, a deletion series was constructed, and the expression of transformants are being analyzed.

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