

Development of transgenic carnations expressing new petal colors and changed lateral branching

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To produce transgenic carnation plants expressing modified flower colors, cultivars of red-flowering carnation ('Desio', 'Garnet') were transformed with a antisense DFR gene encoding dihydroflavonol-4-reductase, and yellow-flowering carnations ('Pallas', 'Keumbyul') were introduced with a CHI gene encoding chalcone synthase isomerase. In 'Garnet' and 'Desio' carnation cultivars, total 146 plants were transformed with anti-sense DFR gene in pGA748/LBA4404. In yellow flowering cultivars, 'Pallas' and 'Keumbyul', transformed with CHI gene in pGA748/LBA4404, twenty putative transformants obtained. The introduction of the transgenes were confirmed through PCR and flower color changes. Rates of phenotypic expression of the transgene, anti-sense DFR gene, vary among the transformants such as lighter pigmentation or chimeric discoloration, more prominently in outer petals of the flowers. Transgenic plants of chi gene bloomed flowers of lighter yellow petals in general. And the most prominent phenotypic changes were discoloration of red strips on petals, which are typical characteristics of the cultivars. White flowering carnation cultivars ('Virginia', 'Eunbyul', 'White charotte', 'West crystal', 'Crystal'), mutants of DFR gene, were transformed with petunia DFR gene and twenty transformants were obtained. Incorporation of the transgene was confirmed through PCR and DNA sequencing. Carnation plants were also transformed with STS2 antisense gene, a chrysanthemum gene homologous to tomato *ls* gene (related to lateral shooting). We obtained 23 transformants which will bloom in months. *Ls* homologous genes were also cloned from cDNA library of carnations and are being characterized. The transformants of petunia DFR gene will be co-transformed with F3',5'H to produce carnations with blue or other petal colors. And with the carnation *ls* gene, carnation with various branching rates will be produced.

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