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Over-Expression of Chinese Cabbage Calreticulin *BcCRT1*, Enhances Shoot and Root Regeneration

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Objectives

Calreticulin (CRT) is a ubiquitous and highly Ca^{2+}-binding protein that is involved in intracellular Ca^{2+} homeostasis and molecular chaperoning mainly in the endoplasmic reticulum (ER). To elucidate the authentic *in vivo* role of the CRT in a plant, we generated transgenic tobacco plants. Here, we show the *BcCRT1* expression pattern and whose overe-expression confers enhanced regeneration in a heterologous plant system. A transient increase in *BcCRT1* expression during shoot and root regeneration is consistent with its participation in developmental transitioin. Our results suggest that *BcCRT1* modulates auxin/cytokinin-mediated morphogenesis.

Materials and Methods

1. Meterials

Plant: *Nicotiana tabacum L.cv.Samson, Agrobacterium* strain: LBA4404, Transformation vector: pBI121

2. Methods

Northern, Southern, and Western blot analysis, Construction of transgenic tobacco, Compared the shoot and root regeneration rate.

Results and Discussion

A cDNA encoding *BcCRT1* were isolated from Chinese cabbage floral bud cDNA library. Northern blot analysis of RNA isolated from various organ tissues showed a basal constitutive level of expression throughout in plant, but more abundant mRNA being detected in young organs. Constitutive over-expression of the *BcCRT1* gene under the control of the cauliflower mosaic virus (CaMV) 35S promoter enhanced the efficiency of shoot and root regeneration from leaf explants in the present of low level of auxin and cytokinin, with a shift in the optimal concentration required for this process. Furthermore, *BcCRT1* transcript levels were increased during regeneration in shoot- and root-induction medium and accumulated in response to phytohormones in Chinese cabbage. Together with the results of transgenic plants and northern bolt analysis suggest that the presence of calreticulin may regulate the induction of plant regeneration.

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