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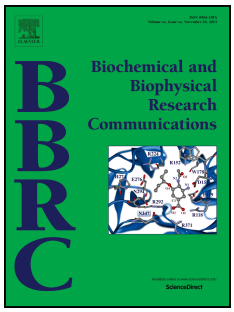

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Cloning and Functional identification of the *AcLFY* gene in *Allium cepa*

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ABSTRACT

Onion (*Allium cepa L.*) is one of the important vegetable crops in the world, usually with a two-year life cycle. The bulbs form in the first year after sowing, then bolting and flowering are induced by low temperature in the following year. Previous studies have shown that *LEAFY* gene is an inflorescence tissue specific gene, and that it is also the ultimate collection channel of all flowering pathway. In this study, using homologous gene cloning and reverse transcription-PCR (RT-PCR), we isolated an inflorescence meristem specific *LEAFY* cDNA, *AcLFY* (JX275962), from onion. *AcLFY* contains a 1119 bp open reading frame, which encodes a putative protein of 372 amino acids, with ~ 70% homology to the daffodils *LEAFY* and > 50% homology to *LEAFY* proteins from other higher plants. Fluorescence quantitative results showed that *AcLFY* gene has the highest expression level in inflorescence meristem during early bolting, and is still expressed in leaves after the formation of flower organs. Overexpression of *AcLFY* gene in *Arabidopsis thaliana* induced early bolting and flowering, whereas knockdown of the endogenous *LEAFY* gene by RNAi caused a significant delay in bolting. In addition, transgenic plants also exhibited significant morphological changes in rosette leaves, branches, and plant height.