

**CHARACTERIZATION OF THE  
TONOPLAST INTRINSIC PROTEIN IN  
COTTON (*GOSSYPIUM HIRSUTUM L.*)**

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**Abstract**

Cell elongation is an essential physiological process in the development of cotton fiber cells. We are investigating the gene family of the gamma-tonoplast intrinsic protein ( $\gamma$ -TIP) in cotton because the analogous protein in the *Arabidopsis* plant has been found to be specifically expressed in elongating cells. We have isolated and sequenced a cDNA clone encoding  $\gamma$ -TIP from a cotton cotyledon cDNA library. Using this sequence, polymerase chain reaction (PCR) primers were made that allowed specific amplification of DNA fragments that encode this protein. DNA fragments that were amplified from genomic DNA were cloned and sequenced. Analysis of the sequences from the clones containing PCR-amplified DNA fragments revealed that the genes contained two introns. Additionally, the sequences could be divided into two primary subfamilies. Using genomic DNA isolated from different *Gossypium* species, PCR amplification, and restriction enzyme analysis, we have found that the one subfamily belongs to the A genome, whereas the other subfamily belongs to the D genome. We have also amplified  $\gamma$ -TIP DNA fragments using cDNA synthesized from 14 days postanthesis fiber RNA, demonstrating the expression of members of the this gene family in elongating fiber cells.