

**A MARKER, GhSEM-1, POTENTIALLY
ASSOCIATED WITH REGENERATION
ABILITY IN COTTON**

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Abstract

A marker protein for embryogenic potential could be useful in determining if target tissue for *Agrobacterium tumefaciens* or microprojectile bombardment has the ability to regenerate plants. Certain varieties of cotton (especially Coker 312) are known to readily form somatic embryos, while other varieties are more recalcitrant. Callus induced from Coker 312-17 was found to be more embryogenic than callus from TM-1. To begin an investigation of the molecular basis for this difference in somatic embryo potential, total RNA was isolated from globular stage callus embryos, calli with heart stage embryos and non-embryogenic calli. A Northern analysis was performed using a developmentally-regulated cotton fiber gene as a probe. This probe hybridized to a single band, GhSEM-1 (*Gossypium hirsutum* somatic embryogenesis marker 1), only in globular staged embryos. Genomic DNA was also isolated from young leaf tissue of both embryogenic (Coker 312-17) and the non-embryogenic line TM-1 and a Southern analysis was performed using GhSEM-1 as the probe. No differences were found between the genomic DNA of both embryogenic and non-embryogenic lines, indicating that this gene was structurally present in both lines but only expressed in Coker 312-17 at the globular stage. Antibodies against a recombinant fusion protein of GhSEM-1 were produced and used in immunoblots after SDS-PAGE separation of proteins from embryogenic and non-embryogenic calli. Additional investigations are needed to characterize and to localize this protein in the somatic tissue cells. This protein could be used as a marker for determining if tissue has embryogenic potential. To our knowledge, this is the first report of a marker potentially associated with somatic embryogenesis in cotton.