2003 BELTWIDE COTTON CONFERENCES, NASHVILLE, TN – JANUARY 6-10

GERMIN-LIKE PROTEINS: WHAT IS THEIR ROLE IN FIBER DEVELOPMENT?

Hee Jin Kim and Barbara A. Triplett
USDA-ARS
Southern Regional Research Center
New Orleans, LA
Tom C. Pesacreta
The Microscopy Center
University of Louisiana
Lafayette, LA

Abstract

A cotton gene with sequence similarity to germin-like proteins (GLPs) was isolated by differential display analysis comparing early stages of cotton fiber development between a wild type line, Texas Marker-1 and a near isogenic mutant, Naked Seed. *GhGLP1* is expressed specifically in fibers and the protein is translocated to cell walls through a non-Golgi pathway. Transcript abundance of *GhGLP1* is developmentally regulated during fiber development. Sequence analysis shows that GhGLP1 is a member of the germin/GLP family, whose members have been implicated in at least six different cellular functions: oxalate oxidases (OxO), extracellular Mn-superoxide dismutases (SOD), ADP glucose pyrophosphatase/ phosphodiesterases (AGPPase), auxin-binding proteins (ABP), extracellular receptors, and wall structural proteins. Purification of the protein from developing cotton fibers and functional analyses indicate that GhGLP1 does not function as an OxO, SOD, or AGPPase. The association of maximal GhGLP1 expression with stages of maximal cotton fiber elongation suggests that GhGLP1 may be involved in cell wall expansion.