OTHER PAPERS

GRAINGENES: SUPPORTING THE SMALL GRAINS COMMUNITY

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ABSTRACT

Funded with hard funds by USDA, GrainGenes provides long-term data sustainability for small grains researchers and hosts a range of community newsletters, databases, and digital workspaces for wheat, barley, rye, and oats. GrainGenes is a gateway for integrated access to several types of peer-reviewed and curated genomic, genetic, and phenotypic data, along with QTLs and other experimental outcomes. The availability of reference genome assemblies of wheat and barley, along with their diversity data, is making a significant impact at GrainGenes and we are creating genome-centric views on our interface with rich links to data that is already housed at GrainGenes, curated over decades. We recently updated the GrainGenes Genome Browser with JBrowse, and are creating training videos for our users to smooth the learning curve for the new interface. GrainGenes will continue creating/implementing new tools and views for the small grains community, supporting them in their research, and providing them a long-term repository for their peer-reviewed experimental and computational data.

EXPRESSION OF AN *ARABIDOPSIS* NON-SPECIFIC LIPID TRANSFER PROTEIN IN PICHIA PASTORIS AND WHEAT

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ABSTRACT

Previously we found that overexpression of a non-specific lipid transfer protein (nsLTP), AtLTP4.4 (AT5G55450) in *Arabidopsis* and yeast protects against trichothecene-induced ROS stress. Protoplasts isolated from *Arabidopsis* expressing the nsLTP had basal ROS levels substantially lower compared to wild type (Col-0) protoplasts. Moreover, exposure to DON induced ROS generation in wild type protoplasts while protoplasts isolated from the AtLTP4.4-GFP transgenic line did not accumulate ROS. This ROS-protective mechanism of LTP protein likely accounts for observed protection against trichothecenes. To determine if this trichothecene protection mechanism extends to wheat, we have generated transgenic wheat lines expressing AtLTP4.4 and codon-optimized (for wheat) AtLTP4.4. We identified Bobwhite, Rollag, Forefront and RB07 lines that express high levels of nsLTP mRNA, but fail to produce detectable protein via Western analysis. Preliminary evidence suggested that the GFP-fusion may help stabilize the AtLTP4.4 protein and thus impact resistance to trichothecenes. We are currently analyzing transgenic wheat lines containing GFP fusions of AtLTP4.4 and a wheat nsLTP (TaLTP3/AY226580). In addition, to understand the mechanism of protection, we have produced both AtLTP4.4 and AtLTP4.4-GFP fusion proteins using the *Pichia pastoris* system for analysis of protein stability and efficacy. We generated X33 (Mut^+) and KM71H (Mut^s) transformants containing both the mature version of nsLTP and a GFP-tagged version of nsLTP. The results of the *P. pastoris* expression system and isolation of the protein will be presented.