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**Project ID: FY07-EN-060** **FY06 ARS Agreement #: New**

**Research Area**: **PGG** **Duration of Award: 1 Year**

**Project Title: Selection of Defense Peptides to Protect Wheat from Fusarium Head Blight.**

## PROJECT 1 ABSTRACT

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The overall project goal is to apply newly developed plant defense technologies to the protection wheat from scab caused by *Fusarium* species. Our technologies include methods for selection of peptides that bind to and disrupt the development of infective structures of invasive pathogens, and means of delivering disruptive defense peptides in transgenic plants via fusion to a scaffold protein. Project objectives for the next year include) selection of peptides with binding affinity for germlings (germinated macroconidia) of *Fusarium graminearum* and 2) selection of peptides from this binding pool that inhibit *F. graminearum* growth and development.

We will select peptides that bind to pathogen structures from combinatorial libraries of one billion or more random peptide sequences. We will next evaluate the ability of recovered binding peptides to inhibit germination and growth of *F. graminearum* macroconidia and germlings representative of diverse isolates. Based on extensive experience in applying these methods to other fungal and human pathogens, we expect to successfully complete these objectives.

The objectives of this project meet the first priority need, novel molecularly based control methods, as described in the area of Pathogen Genetics and Genomics (PGG) within the U.S. Wheat and Barley Scab Initiative. The Objectives will also provide characterization of pathogen proteins that are involved in basic development and pathogenesis. We will be able to identify these factors by functional assays using peptide inhibition. The results of this project will ultimately contribute to the development of novel wheat germplasm based on new forms of plant defense