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Project Title: Identifying *F. graminearum* Pathogenesis Genes under Field Conditions.

PROJECT 1 ABSTRACT

(1 Page Limit)

Few organisms have the ability to cause disease on plants. *Fusarium graminearum* utilizes toxins as pathogenesis compounds to cause Fusarium Head Blight (FHB) on wheat, yet the toxins don't fully explain its pathogenesis ability. Identifying the genes that allow microbial organisms to cause disease informs plant breeders therefore accelerating the development of resistant lines. In addition, a better understanding of the pathogenesis processes will lead to novel forms of resistance. Our goal is to identify diverse pathogenesis genes from multiple field strains of *F. graminearum*. We will identify these genes from naturally infected samples, collected from wheat lines with various levels of resistance. We will then sequence the RNA and identify strain specific genes that allow the pathogen to cause disease on different wheat lines. After the repertoire of pathogenesis genes is characterized for several strains, we will conduct pathogenesis assays to confirm the involvement of these genes on causing disease on greenhouse and field assays. This project is intended to develop new strategies for reducing the impact of FHB focusing on pathogen genes and responses; and to characterize plant-fungal interactions in plant lines being developed by the University of Illinois' soft red winter wheat program.