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PROJECT 1 ABSTRACT
(1 Page Limit)

Fusarium head blight pathogens produce trichothecene mycotoxins such as deoxynivalenol (DON) that are critical for determining the outcome of plant disease interactions. While much progress has been made in understanding the enzymatic pathways for DON biosynthesis, little is known about how toxins are exported from fungal cells and delivered to the host. The specific goal of this proposal is to examine several candidate multidrug transporters in *Fusarium graminearum* for their potential role in trichothecene export and fungal virulence. We have identified four co-regulated multidrug resistance transporters that, along with the trichothecene efflux pump *Tri12*, may be essential for maximum trichothecenes export. Each of the five genes have been individually deleted and the mutant alleles will be combined by sexual recombination to create strains with deletions in combinations of two and three per strain. These genotypes will be tested for their ability to accumulate DON *in vitro* and *in planta* and for their effect on fungal virulence. Additionally, the genes will be expressed in yeast to determine their ability to allow for DON resistance when expressed in this heterologous host. This information is potentially useful because trichothecene exporters that deliver toxin to the plant when expressed in *Fusarium*, may allow for resistance to DON if expressed in plants. Our ultimate goal is to develop transgenic wheat and barley lines with increased trichothecene tolerance achieved by expression of *Fusarium* proteins conferring resistance to DON. This transgenic approach may represent a novel strategy by which small grain crops may escape the toxic effects of pathogen-produced small molecules.