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Duration of Award: 1 Year

Project Title: Development and Testing of Improved Enzymes for Transgenic Control of FHB.

PROJECT 3 ABSTRACT

(1 Page Limit)

The primary goal of this proposal is to develop improved enzymes for the inactivation and degradation of fungal mycotoxins associated with Fusarium head blight and test their efficacy in barley. In the next year we plan to optimize the efficacy of trichothecene 3-*O*-acetylase from *F. graminearum* (Tri101) for inactivation of DON and nivalenol in barley. This will be accomplished by protein engineering starting from the structures and kinetic analyses of Tri101 from *F. sporotrichioides* and *F. graminearum* that were completed during the previous funding cycles. The prospect of success in this first phase is high because the kinetic analysis of this enzyme suggests that there are already significant differences in specificity between isozymes from different fungi. An important component of the investigation is the established program to test the improved enzymes against FHB in barley and as such this proposal represents an interdisciplinary collaboration. We also plan to continue to integrate the *in vitro* studies of Tri101 with the properties of the enzyme expressed in transgenic cereals to investigate whether the limited performance of the transgenic cereals is due to low expression, or inactive or post-translationally modified protein.