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PROJECT 1 ABSTRACT
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One of the most severe mycotoxin problems in the U.S. is trichothecene contamination of small grains by *Gibberella zeae* (anamorph *Fusarium graminearum*) in a disease called scab or Fusarium head blight (FHB). Here we propose a novel method to control trichothecene contamination in barley using RNA interference (RNAi) technology to block mycotoxin production. Through use of RNAi technology we will:

1. Demonstrate RNAi silencing of trichothecene production in *Fusarium graminearum*
2. Demonstrate RNAi control of trichothecene production in barley

RNAi is a conserved eukaryotic gene regulatory mechanism often referred to as gene silencing. We propose to silence expression of a key transcription factor gene (*tri6*) for the control of tricothecene production in *Fusarium* by transforming barley with an inverted repeat sequence of *tri6*. It is hypothesized that the inverted repeat transcript will be fragmented as a part of a conserved eukaryotic silencing mechanism. These fragments will then be taken up by hyphae and trigger a silencing mechanism in *Fusarium*. This research is designed to quickly control mycotoxin contamination of barley and should also be applicable to wheat.