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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. Identify the parameters required for uptake and spread of siRNA in fungi
2. Demonstrate RNAi control of trichothecene production in barley and/or wheat

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 and wheat with an inverted repeat sequence of *tri6* (we propose two crops as one may work better than the other). It is hypothesized that the inverted repeat transcript will be fragmented into small RNA species known as siRNAs as a part of a conserved eukaryotic silencing mechanism. These siRNAs 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 wheat.