Development of Immunocapture Real-Time PCR to detect *Fusarium* species in Grains and Foods

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Concern for *Fusarium* species

- Produce mycotoxins: trichothecenes, zearalenone, fumonisins
- Advisory levels for DON
- Europeans regulate fumonisins in corn
- Stable to processing methods
- Low level ingestion of *Fusarium* mycotoxins

Mycotoxin regulation

- Action Levels - set by Food and Drug Administration (FDA)
- DON - wheat products – 1 µg/g
- Fumonisins - corn products – 2-4 µg/g
- Zearalenone body weight – 0.5 µg/kg

Objectives of Research

- To develop immunocapture of *Fusarium* species using antibodies of *F. graminearum* and *F. moniliforme*
- To make PCR primers specific for *F. graminearum* (*Tri6* gene) and *F. moniliforme* (*Fum5* gene)
- To use immunocapture real-time PCR to detect *Fusarium* species in foods/grains

PCR Primers

- DNA sequences flanking the 5.8S rDNA in *Fusarium* species
- *Tri6* regulatory gene for trichothecene biosynthesis in *Fusarium* species
- *Fum5* polyketide synthase gene for fumonisin biosynthesis in *Fusarium* species
**Immunocapture qPCR Methods**

- Centrifuge tubes
- Non-magnetic beads
- 96-well microtiter plate
- Analysis of inoculated cornmeal

**Future Research**

- Combine antibody and PCR techniques to increase detection limits
- Develop real-time PCR methodology