



Southern Illinois University System

### Applications

- Agricultural pathogen control
- Genetic-based crop engineering
- Crop yield management

### Inventor(s)

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*Dr. Fakhoury is an Associate Professor of Plant Soil and Agricultural Systems at SIU Carbondale. His research specializes in plant pathology, fungal genetics, mycotoxins, and plant-microbe interactions.*

David Lightfoot, PhD

*Dr. Lightfoot is a former Professor of Plant Soil and Agricultural Systems at SIU Carbondale. His research focuses on novel gene discovery by genomics, targeting commercially valuable disease resistances, phyto-pharmaceuticals, and crop yield boosting elements.*

### Contact

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## gdhA Gene Expression to Increase Infection Resistance in Plants

Members of the fungus genus *Aspergillus* produce aflatoxin, a strictly regulated and highly carcinogenic metabolite in plants. In particular, *Aspergillus flavus* commonly afflicts many important food crops including the cereal crops maize, sorghum, pearl millet, rice, wheat, and oilseeds including peanut, soybean, sunflower and cotton. Infection with *Aspergillus flavus* causes aflatoxin to accumulate, and a relatively small contaminated number of infected plants can contain enough toxin to necessitate discarding a large-scale crop harvest batch. Similarly, *Fusarium virguliforme* is another damaging fungal pathogen that causes root rot in crops. At this time, few options are available to control these pathogens.

### Invention

SIU researchers have developed methods to increase crop resistance to both *Aspergillus flavus* and *Fusarium verguliforme*. Methods include transforming potentially susceptible plants with a bacterial NADP-specific glutamate dehydrogenase (gdhA) enzyme gene. Such transformed plants can be employed in the field to increase crop yield by reducing the impact of *Aspergillus flavus* and *Fusarium verguliforme*.

### Key Advantages

- gdhA sequence confers resistance to multiple pathogens.
- Plant transformation with the gdhA sequence can be accomplished by standard means known in the art.
- gdhA sequence can be used across many crops, including a variety of traditional cereal crops.

### Status

U.S. Patent #8,383,887 issued for this technology on February 26, 2013. The technology is available for license.

*Other opportunities related to this technology, included but not limited to sponsored and/or collaborative research, may be available. Please reach out to the designated contact identified at left for more information.*