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EXPRESSION OF BEAN *PGIP2* UNDER CONTROL OF  
THE BARLEY *LEM1* PROMOTER LIMITS *FUSARIUM*  
*GRAMINEARUM* INFECTION IN WHEAT

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**ABSTRACT**

Fusarium Head Blight (FHB) caused by *Fusarium graminearum* is one of the most destructive fungal diseases of wheat worldwide. The pathogen infects the spike at flowering time and causes severe yield losses, deterioration of grain quality, and accumulation of mycotoxins. Better understanding of the means of pathogen entry and colonization of floral tissue is crucial to providing effective protection against FHB. Polygalacturonase inhibiting proteins (PGIPs) are cell wall proteins that inhibit the activity of polygalacturonases (PGs), a class of pectin-depolymerizing enzymes secreted by microbial pathogens, including *Fusaria*. The constitutive expression of a bean PGIP (PvPGIP2) under control of the maize *Ubi1* promoter limits FHB symptoms and reduces mycotoxin accumulation in wheat grain [Janni et al. 2008 Molec. Plant Microb. Interact. 21:171]. To better understand which spike tissues play major roles in limiting *F. graminearum* infection, we explored the use of PvPGIP2 to defend specific spike tissues by expressing it under control of the barley *Lem1* promoter [Somleva and Blechl 2005 Cer. Res. Comm. 33:665]. We show here that the expression of PvPGIP2 in lemma, palea, rachis and anthers reduced FHB symptoms caused by *F. graminearum* compared to symptoms in infected nontransgenic plants. However, the expression of PvPGIP2 only in the endosperm under control of a HMW-glutenin gene promoter did not affect FHB symptom development, indicating that once the pathogen has reached the endosperm, inhibition of the pathogen's PG activity is not effective in preventing its further spread.