Transgenic expression of antimicrobial peptides from insects enhances resistance against pathogenic fungi in tobacco and barley

Khalifa, W., J. Imani, M. Rahnamaeian, G. Langen, B. Altincicek, A. Vilcinskas and K.-H. Kogel

Research Centre for BioSystems, Land Use and Nutrition (IFZ), Justus-Liebig University, Institute of Phytopathology and applied Zoology, Heinrich Buff-Ring 26-32, 35392 Giessen, Germany

Plant pathogenic fungi cause severe crop losses worldwide and therefore threaten human nutrition (Oerke *et al.* 1997). Since cultural practices, agrochemicals, and conventional breeding for disease resistance are not sufficient and permanently successful in keeping pathogens and pests under control, alternative strategies in sustainable agriculture attracted great attention during past decades among which the use of antimicrobial peptides (AMPs) to enhance plant resistance has been initially explored (Gao *et al.* 2000). Plant genetic engineering in combination with AMPs from insects and other animals represent powerful tools to create disease resistant crops (Vilcinskas and Gross 2005). Recently, we showed that Gallerimycin, a defensin of the greater wax moth, protect tobacco against the fungal pathogens powdery mildew and *Sclerotinia minor* (Langen *et al* 2006). Gallermycin was produced under control of a pathogen inducible promoter and transported into the apoplast.

For further investigation of AMPs effects against plant pathogens and in the interaction with root endophytes, we generated transgenic barley containing Metchnikowin, an antimicrobial peptide isolated from *Drosophila* via *Agrobacterium*-mediated transformation.

The expression has been confirmed in transgenic barley via RT-PCR and Q-PCR with specific primers for Metchnikowin gene. Thereby, candidates for transgenic plants expressing Metchnikowin were identified.

In preliminary experiments, transgenic plants have been tested for resistance to pathogens and abiotic stress in regard to the AMP expression level.

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