

# Transcription factor ERF5 of grapevine is involved in pathogen resistance

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Breeding of grapes has a long tradition and is nowadays assisted by molecular markers associated with different traits. Since the introduction of pathogens like *Erysiphe necator* and *Plasmopara viticola* to Europe from North America in the 19<sup>th</sup> century one important trait is pathogen resistance. Different loci for pathogen defense have been identified through the last years. But it is still unknown which genes in the regions of the loci are relevant and what kind of molecular mechanism of plant defense they mediate. So it is important to acquire knowledge of the plant defense mechanisms involved.

To unravel the molecular mechanisms of plant defense, one approach was the comparison of a resistant and a susceptible genotype after inoculation with *E. necator* by differential gene expression analysis. It could be shown

that ethylene-responsive transcription factor 5 (ERF5) is 2.1-fold upregulated in the resistant genotype.

Currently we found that ERF5 is 4.6-fold upregulated in the resistant genotype after inoculation with *P. viticola* as compared to non-inoculated controls. In the susceptible genotype ERF5 remains unchanged after inoculation with *E. necator* or *P. viticola*. Furthermore, it appears that ERF5 positively regulates the promoter of the pathogen-related protein 10 (PR10). ERF5 encoding genes from a resistant and a susceptible genotype were infiltrated in another susceptible genotype. Leaf cuttings of the infiltrated plants were inoculated with *P. viticola*. After one week specifically infiltrated plants with ERF5 from the resistant genotype showed a significant increase in resistance.