

# Molecular characterization of the resistance locus *Ren3* against powdery mildew (*Erysiphe necator*) from the grapevine cultivar 'Regent'

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Powdery mildew is one of the most devastating diseases of grapevine (*Vitis vinifera* L). The disease is caused by *Erysiphe necator* Schw. (syn. *Uncinula necator* (Schw.) Burr, anamorph *Oidium tuckeri* Berk.), an ascomycete fungus, which was introduced from North America to Europe in 1845. The traditional European cultivars are highly susceptible to the fungus and still today huge amounts of fungicides are necessary to counteract the pathogen.

Many North American *Vitis* species developed resistance against *Erysiphe necator* due to co-evolution of host and pathogen. This process promoted the development of a genetic locus called *Ren3*, which was characterized by WELTER et al. (2007) in the cultivar 'Regent'. Later DUDENHÖFFER J. and ZYPRIAN E. (2012) showed, that several genes are located within this region, which show great similarity to genes known to mediate resistances in other plants.

In the recently started project the physical map of the *Ren3* locus will be completed via finishing partial sequences obtained from BAC clones in the *Ren3* locus by amplicon sequencing.

The obtained sequences will allow further searching for open reading frames, which contain functional domain structures already known from identified resistance genes. Some of these genes will be cloned into a binary expression vector and checked for functionality upon transformation of susceptible grapevine cultivars with *Agrobacterium tumefaciens*.

Furthermore microscopic studies will be performed to follow the pathogen attack and its cytological effects in resistant and susceptible grape cultivars. This will help to elucidate the mechanisms of resistance.