

Localisation and fine-mapping of the downy mildew resistance locus *Rpv10* in grapevine

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The pathogen *Plasmopara viticola* causing downy mildew is an oomycete native to North America. It was distributed throughout almost all wine growing regions around the world. Interestingly several accessions of the Asian wild grape *Vitis amurensis* possess resistance to *P. viticola*. Introgression of this resistance source into the gene pool of the European high quality grapevine *V. vinifera* resulted in new cultivars, such as 'Solaris', resistant to downy mildew. QTL analysis of a cross population derived from a cross between the breeding strain Gf.Ga-52-42 and the cultivar 'Solaris' revealed the resistance locus *Rpv10* on chromosome 09. A subsequent fine mapping resulted in confidence intervals of less than one cM corresponding to 79 kb between the flanking markers on the grapevine reference genome. Four potential resistance candidate genes were identified in

this section of the sequence. SSR markers flanking the locus can be used in marker assisted breeding (MAS) for screening genetic resources and breeding material. A set of 94 *V. amurensis* descendants was screened and 22 genotypes carrying the *Rpv10* locus were identified. These genotypes are potential sources to introduce the *Rpv10* locus into the breeding process for pyramiding resistance loci by combining different resistance donors. This is expected to result in plants which possess high and durable resistance properties. MAS offers the possibility to select these promising genotypes. By taking advantage of newly developed markers for *Rpv10* the locus can be used immediately in resistance breeding to achieve high level of downy mildew resistance by pyramiding with further resistance loci.