

## GRAPEVINE STILBENE SYNTHASE EXPRESSION AND RESVERATROL SYNTHESIS FOLLOWING DOWNY MILDEW INFECTION

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In the *Vitaceae* family, phytoalexins constitute a rather restricted group of molecules belonging to the stilbene family. Stilbenes represent a group of natural phenolic compounds including *cis*- and *trans*-resveratrol (3,4',5-trihydroxystilbene), resveratrol glycosides, resveratrol oligomers (viniferins) and pterostilbene.

Resveratrol plays a relevant role in the resistance of grapevine challenged by fungal pests, and it is also the major compound accumulating in response to this stress.

Within the *Vitis* genus genes encoding stilbenes are widespread, even in susceptible species and varieties, and the understanding of genes involved in stilbene biosynthesis, as well as the elucidation of their regulation, is rapidly expanding. Stilbene production is elicited by fungal cell walls, polysaccharide fragments and other fungal molecules which induce *de novo* synthesis of enzymes of the general phenylpropanoid pathway. In particular, the last step is catalyzed by stilbene synthase (STS), which produces simple stilbenes (*cis*- and *trans*-resveratrol) from one *p*-coumaroyl-CoA and three malonyl-CoA molecules.

The plant material subject of the present study comprises two international cultivars (Cabernet sauvignon, Chardonnay), three genotypes indigenous of the Euganean area (Friularo, Pataresca, Marzemina bianca) and 12 interspecific hybrids deriving from a cross between Chardonnay and Bianca, susceptible and resistant to *Plasmopara viticola* respectively.

Healthy young leaves were collected for each plant, and leaf discs were produced and artificially inoculated with a suspension of *P. viticola* sporangia. Total RNA isolation was performed at 0-, 2- and 6dpi, and stilbene synthase transcript level measured by Real Time RT-PCR.

At the same time points, resveratrol content in the infected discs was quantified by HPLC, and macroscopic symptoms were scored, in order to finally relate the stilbene synthase expression to the resveratrol synthesis and the infection's macroscopic display in the course of *P. viticola* infection.

The outcomes of the analyses highlighted differences among the grapevine genotypes concerning both stilbene synthase expression and resveratrol synthesis in leaves challenged by downy mildew.