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P38 Metabolomic Approach for understanding Biochemical Mechanism of Grapevine Resistance to *Plasmopara viticola*

G. Chitarrini¹, M. Stefanini², L. Zulini², A. Vecchione², G. Di Gaspero³ and U. Vrhovsek¹

¹Food Quality and Nutrition Department, Research and Innovation Centre, Fondazione Edmund Mach (FEM), via E. Mach 1, 38010 San Michele all'Adige, Italy; ²Genomics and Biology of Fruit Crops Department, Research and Innovation Centre, Fondazione Edmund Mach (FEM), via E. Mach 1, 38010 San Michele all'Adige, Italy; ³Dipartimento di Scienze Agrarie e Ambientali, University of Udine, via delle scienze 208, 33100, Udine, Italy

E-mail address of corresponding author: giulia.chitarrini@fmach.it

Downy mildew is one of the most important diseases of grapevines (*Vitis vinifera* L.), especially for the European varieties caused by the oomycete pathogen *Plasmopara viticola* (Berk. et Curt.) Berl. et de Toni.

This pathogen was reported for the first time in Europe in 1878, where it was probably imported from North America. To reduce sprayings, *V. vinifera* cultivars were crossed in the past with resistant *Vitis* spp, to select resistant hybrids, but the biochemical mechanisms underlying the resistant phenotypes are poorly understood. Plants respond naturally to a multitude of stress conditions and the biosynthesis of protective chemicals is one of their major strategies (1). The metabolome, typically defined as the collection of small molecules produced by cells, offers a window for interrogating how mechanistic biochemistry relates to cellular phenotype (2). A metabolomic approach was applied, enabling the analysis of hundreds of biomarker compounds of different chemical classes allowing a better understanding of defense response. Particularly primary and secondary metabolites and lipids were analyzed. The aim was to cover all important classes of plant metabolites and to aim at identifying early stage biomarkers within the first 96 hours after pathogen inoculation.

Keywords: oomycete, resistance, metabolomics, *Vitis*

References: (1) Harborne J. B., 1999. *Biochem. Syst. Ecol.* 27:335–367. (2) Patti G.J., et al. 2012. *Nat. Rev. Mol. Cell Biol.* 13:263–269.

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