



## **Developing molecular tools to improve grapevine resilience against pathogens: new insights on the role of chloroplasts lipids**

Place of work/: GPS lab and Plant Physiology Lab, C2 building, 4<sup>th</sup> floor

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Grapevine (*Vitis vinifera* L.) represents a great agricultural and economic value worldwide, with deep ties to human culture for more than 5000 years. In 2019, grapevine plantation areas reached 7.4 Mha, with Spain, Italy, and France leading these plantation areas in Europe (OIV data, 2020). The European elite grapevine cultivars are highly susceptible to various pathogens and several phytochemical applications each growing season are made to control the main grapevine pathogens. In the last years, there is an increasing demand for more sustainable agricultural practices, with several guidelines being established within the European Union (Directive 2009/128/EC) which fosters the need to develop new approaches to reduce the use of these phytochemicals. On the past years, studies by our group focusing on the comparison between tolerant and susceptible grapevine genotypes, has highlighted several key components of the resistance mechanisms to pathogen challenge, namely associated to lipid metabolism and signaling events. With this Master thesis project, we aim at deepening our knowledge regarding the role of chloroplasts in the the defence mechanisms to downy mildew pathogen. Both molecular biology and biochemical approaches will be conducted namely fatty acid and lipid profiling (GC and TLC), expression analysis of known defense marker genes (qPCR). In parallel, gene families coding enzymes involved in plastidial lipid metabolism will be characterized in *Vitis vinifera* and the expression of some selected genes will also be assessed.

Techniques: Bioinformatic tools, Quantitative real time PCR, chloroplast isolation, Chloroplast isolation Gas and Thin layer Chromatography, Chloroplasts isolation,

Project Integration in BioISI strategic program: BioISI is a multidisciplinary research centre that selected grapevine research as a flagship project. This thesis project is fully integrated in the BioTech – Biotechnology line and will contribute for strengthening the BioISI's position in the agricultural and wine sector.

**Students selected for this project, after thesis registration, are eligible to apply to the BioISI Junior Programme (supporting 8 students with a 6-month Scholarship(BII), being the selection criterium the academic merit of the candidates.**