



Grapevine development in a glimpse: the role of apoplast through metabolomics and proteomics

Place of work:

Grapevine Pathogen Systems Lab, C2 building, 4th floor, lab 37, BiolSI at Faculdade de Ciências da Universidade de Lisboa

&

LCP-A2MC - Laboratoire de Chimie et Physique - Approche Multi-échelles des Milieux Complexes (LCP-A2MC), Université de Lorraine, Metz, France

Supervisors: Rita B. Santos (FCUL) and Vincent Carré (LCP-A2MC)

Contact: absantos@fc.ul.pt

Grapevine (*Vitis vinifera* L.) has high economic impact worldwide with plantation areas over 7.4 Mha (OIV data, 2021). Grapevine season in Portugal typically starts in March/April with bud burst and ends in August/September after grape harvesting. Climate change impacts the vegetative growth of many crops, including grapevine, leading to early harvesting and severe pathogen problems. Plant development is controlled by complex mechanisms and environmental stimuli and recent studies have highlighted the role of the apoplast in the regulation of these mechanisms. The apoplast comprises the intercellular space and the cell walls. Important processes such as nutrient and water transport, cellulose synthesis, and the synthesis of molecules involved in plant defense against both biotic and abiotic stresses, take place in it. The most important molecules are ROS, antioxidants, proteins, and hormones that play an important role in plant development and plant responses to various stress conditions. The different phases of grapevine vegetative growth are poorly studied by Omic approaches such as proteomics and metabolomics, particularly concerning apoplast dynamics. The main aim of this proposal is to characterize apoplast composition of different grapevine cultivars at four developmental stages proteomics and metabolomics. Plant material is already available at the GPS Lab and the student will apply activity-based protein profiling (ABPP) assay using probes that specifically label active proteases, prepare samples for mass spectrometry (proteomics and metabolomics approaches) and develop a short period at LCP-A2MC for metabolome profiling. The candidate will also benefit from the support of Marisa Maia at LCP-A2MC (also a member of GPS Lab), expert in HRMS for grapevine metabolomics. Data analysis and validation will be conducted at the GPS Lab.

If you are interested contact us – ERASMUS+ program deadline 31st May
Student may also apply for a BiolSI Junior fellowship (6 months).