Grapevine secretome: plant cell cultures as a biotechnology tool for understanding plant defense

Place of work:
Grapevine Pathogen Systems Lab, C2 building, 4th floor, lab 37, BioISI at Faculdade de Ciências da Universidade de Lisboa

Supervisors: Rita B. Santos and Andreia Figueiredo (FCUL)

Contact: absantos@fc.ul.pt

Grapevine (*Vitis vinifera* L.) has high economic impact worldwide with plantation areas over 7.4 Mha (OIV data, 2021). However, this crop is highly affected by plant pathogens such as the oomycete *Plasmopara viticola* which causes the downy mildew disease. Current disease management practices rely on the intensive use of pesticides. However, the European Union has clear guidelines that advocate for more sustainable agriculture practices. In the last years, our group has been working to unravel the different mechanisms involved in grapevine resistance to pathogens. Yet, the grapevine season in Portugal occurs from March/April to August/September, so all the experimental assays must be performed in this specific period. To overcome this practical limitation, grapevine cell cultures will be established and used to perform trial studies before the grapevine season begins in the spring of 2023.

The main aim of this proposal is to establish grapevine cell cultures at the GPS Lab as well as to develop transformation protocols that will enable the production and assessment of relevant disease resistant candidates. This will imply cloning the gene(s) of interest, recombinant protein production and recovery and/or elicitation with molecules of interest. The assessment of the produced proteins or molecules will be done via mass spectrometry through proteomic and metabolomic approaches. Mass spectrometry will be performed by a collaborator in Germany and the data analysis and validation will be conducted at the GPS Lab.

Student may apply to a BioISI Junior fellowship (6 months).