SEMINAR

Aroma formation in *Vitis vinifera* grape berries

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SALA CONVITTO

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Aroma, an important attribute of wine quality, is a mixture of compounds constituting the so-called “bouquet” that is synthesized in ripe grape berries and partially during the vinification and aging processes. It must be noted, however, that most of the wine aroma precursors derive from grape berries that might be altered by fermentation and/or maturation conditions; its complexity and genetic basis is poorly understood. To approach this intriguing theme, we compared the chemical and transcriptomic analyses in mid-ripe stage grape berries of six Greek wine varieties (Assyrtiko, Malagouzia, Moschofilero, Roditis, Xinomavro and Agiorgitiko) and in selected clones exhibiting high and low aroma profiles based on wine tasting criteria.

In the present work, the chemical and RNA-seq data were analyzed by applying all recent bioinformatic tools, (PCA, Volcano plot, Heat Maps, Go enrichment and KEGG analysis) to visualize the differences/similarities among and within the varieties and to propose functional biosynthetic pathways, as well as to pinpoint genes participating in the aroma formation in ripening grape berries. Among these genes, the following were functionally caracterized by expressing them either in yeast or by in vitro assays: raspberry ketone synthase (RZS1), contributing to the formation of 4-(4-Hydroxyphenyl) butan-2-one (raspberry ketone), coniferyl alcohol acetyl transferase (CAAT) and eugenol synthase (EGS1), both participating in the synthesis of eugenol, all belonging to the phenylpropanoid pathway, R-linalool synthase (RLin), linalool/nerolidol synthase (LinNer), and P450-CYP76F14, a wine lactone synthase participating in the biosynthesis of precursors of wine lactone, namely E)-8-hydroxylinalool and E)-8-carboxylinalool, glutathione S transferases (GST3, GST4), και vanillin synthase (VAN).