

HT MS coupled to an Agilent 7890 GC) and reversed phase UHPLC-MS (Thermo Scientific Accela UHPLC coupled to a LTQ-Orbitrap Velos hybrid MS), respectively.

Method reproducibility, intra-subject and inter-tissue variability will be reported and the method shown to be suitable for comparisons within a single tissue type. However, systematic variations were observed in the internal standards (GC-MS) between tissue types, which suggest that tissue-specific matrix effects were present. This complicates the interpretation of inter-tissue comparisons, which should be approached with caution if the presented method is used. Furthermore, it emphasises the utility of employing internal standards as a form of internal QA, regardless of subsequent approaches to data normalisation and/or drift correction.

POSTER 82.

CHANGES IN GRAPE PHENYLPROPANOID COMPOSITION INDUCED BY LEAF REMOVAL IN TWO 'PINOT NOIR' VINEYARDS

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Beyond the biological significance, secondary metabolites are crucial in the determination of grape and wine quality attributes, and their

composition, can be significantly modulated by exogenous (site, climate, soil properties) and endogenous factors (variety, clone, rootstock) and finally by agricultural practices. The grape composition is undoubtedly crucial for Pinot noir production and any improvements in polyphenol complexity are welcomed. Leaf removal is an important canopy management practice, leading either to an improvement of fruit-zone microclimate and grape quality [1]. Different results can be achieved depending on the timing of performing, and pre-flowering leaf removal seems to be more promising even if further results are needed [2].

In this study, leaf removal was performed in two 'Pinot noir' vineyards (located in Vipava Valley, Slovenia and in San Michele all'Adige, Italy) at different phenological stages: 10 days before flowering (pre-flowering leaf removal) and at veraison, while untreated vines were used as a control. For each shoot 4-to-6 leaves were removed manually. At harvest, the grapes from all the treatments were collected separately, processed, and a comprehensive LC-MS/MS metabolic profiling approach [3] was adopted in order to highlight the induced quantitative changes of several dozens of phenolic compounds including a number of up to date very poorly studied ones.

The results revealed a number of changes related both to vineyard location and to the timing of leaf removal. As related to vineyard location, the occurrence of secondary metabolites was 40%-higher in Italian samples, probably due to the different ripening status of the grapes (25 Brix in Italy vs 22 Brix in Slovenia). On the other hand, comparing leaf removal treatments, the most significant changes were observed in the group of 18 flavonols. The amount of total flavonols was increased by 216% and 109% in Slovenia and by 56% and 20% in Italy, in the pre-flowering and in the veraison treatments, respectively,

as compared with the controls. Pre-flowering leaf removal has also triggered significant changes in total hydroxycinnamic acids (both vineyards) and anthocyanins (in Slovenia), while other phenolic groups showed some changes in occurrences within individual group members, but were not significant in total amount. Despite location differences, grape polyphenols included in the study were positively affected by both leaf removal treatments, particularly when performed at early phenological stages. Metabolic profiling technique represents a powerful tool, but a lot of efforts and data are still required towards a comprehensive understanding of the mechanisms behind it.

[1] Haselgrove L., *et al.*, Australian Journal of Grape and Wine Research 6, (2000) 141-149; [2] Sternad Lemut M., *et al.*, Journal of Food Composition and Analyses 24, 6 (2011) 777-784; [3] Vrhovsek U., Journal of Agricultural and Food Chemistry, DOI: 10.1021/jf2051569.

POSTER 83.

AN NMR-BASED METABONOMICS INVESTIGATION OF PLASMA USING AN OVINE MODEL OF PERICONCEPTIONAL OVERNUTRITION

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The growing prevalence of obesity is a major health concern because it is a risk factor for several chronic diseases including hypertension, coronary heart disease, some

cancers and type two diabetes. There is increasing evidence indicating that factors such as maternal obesity or overnutrition during pregnancy can influence long-term energy balance in offspring. Maternal obesity has been associated with offspring weight at birth as well as childhood and adolescence obesity. The mechanisms underlying these observations are unclear. To investigate these effects we have used an ovine model of periconception overnutrition and employed NMR-based metabonomics profiling of plasma from fetuses at 140 days of development - the latter were transferred as embryos from donor ewes into control recipient ewes. NMR-based metabonomics technology can now provide system-wide information on the major metabolites in plasma. Metabonomics has been successfully applied in diagnostic biomarker discovery, toxicology and pharmaceutical research. One-dimensional ¹H NMR spectra of plasma samples from the donor ewes during the period of periconceptual overnutrition and fetuses at 140 days of development were recorded and exported for multivariate statistical analyses. The resulting data indicated that several metabolic pathways were involved in responses of donor ewes and fetuses to periconceptual overnutrition.

POSTER 84.

EVALUATION OF EXTRACTION METHODS FOR WHOLE BLOOD SAMPLES

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Choosing the right extraction method for metabolomic analyses is critical for getting desired results. Various methods and extraction solvents have been evaluated