

6th International Conference and Exhibition on **Analytical & Bioanalytical Techniques**

September 01-03, 2015 Valencia, Spain

Omics tools for the biological evaluation of olive-derived bioactive substances

Nikolaos Lemonakis¹, Maria Halabalaki¹, Alexios Leandros Skaltsounis¹, Anthony Tsarbobopoulos¹, Evangelos Gikas¹, Vassilios Mougios², Lindsay Brown³ and Hemant Poudyal³

¹University of Athens, Greece

²Aristotle University of Thessaloniki, Greece

³University of Southern Queensland, Australia

Introduction: Olive derived substances occupy a central role in the diet of the Mediterranean basin, with low occurrence of cardiovascular diseases and cancer incidents. It is evidenced that such molecules especially the secoiridoid oleuropein and the polyphenol hydroxytyrosol could play a significant role in the prevention of the aforementioned as well as various other diseases e.g., they also exhibit anti-Alzheimer potency, antiviral properties etc., and thus the study of their impact on the metabolome is of paramount importance. In this study, MS metabolomics will be employed to assess the effect of administering oleuropein to physically active, healthy males, as well as hydroxytyrosol to young rats suffering from metabolic syndrome.

Methods: Oleuropein was administered to physically active, healthy males with matched age, body mass index and physical condition. Blood and urine were collected by a double blind crossover experiment. The samples were analyzed by UHPLC-ESI LTQ-Orbitrap in both positive and negative ion mode and the resulting data have been explored by various peak-picking algorithms. The resulting data were subjected to multivariate data analysis employing various algorithms and the results loadings were inserted to on-line databases for the investigation of the metabolites. In a similar manner, hydroxytyrosol was administered to rats suffering from metabolic syndrome and the samples were analyzed by UPLC-ESI MS on QqTOF and Orbitrap analyzers. The Metabo-analyst work flow has been used in the last case for the analysis of the results.

Preliminary Data: In the first case the impact of the peak peaking algorithms (centwave, centroid Picker and mzmatch) has been investigated giving similar results. The statistical evaluation revealed that the intra-subject variation was large and could obscure the final results; therefore, a multi-level approach using sparse-PLS-DA has been used in order to analyze the impact of oleuropein supplementation on the metabolism. It has been found that the metabolism is affected in each individual and there is significant discrimination between the groups serving as control and the treatment.

Result: In the case of hydroxytyrosol the results show that the metabolism is also severely affected in an acute manner and the experimental animals exhibit a time course dependent metabolomic profile. The analysis of the results showed that the fatty acid metabolism has undergone significant change and this is also reflected by the fatty acid profile as well as by changes in various clinical parameters.

Novel Aspect: The mass-spectrometry metabolomics investigation of the two major olive-derived bioactive substances.

nicklem26@gmail.com

Notes: