

**O1 SS2**

**PREPARATIVE MULTIDIMENSIONAL GAS CHROMATOGRAPHY COUPLED TO SPECTROSCOPIC ANALYSIS AS A POWERFUL APPROACH FOR THE ISOLATION AND CHARACTERIZATION OF UNKNOWN MOLECULES**

G. De Grazia<sup>1</sup>, D. Sciarrone<sup>2</sup>, L. Mondello<sup>1,2,3,4</sup>

<sup>1</sup>*Chromaleont s.r.l., c/o Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy*

<sup>2</sup>*Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy*

<sup>3</sup>*Unit of Food Science and Nutrition, Department of Medicine, University Campus Bio-Medico of Rome, Rome, Italy*

<sup>4</sup>*BeSep s.r.l., c/o Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy*

The growing interest towards new molecules, is leading researchers and industries to investigate natural matrices. The identification of unknown components, requires the isolation of the target analytes with a high purity degree. Conventional GC analysis for preparative purpose presents different issues when highly pure compounds have to be collected at milligrams level in a reasonable time. A limited amount of neat or diluted sample can be analyzed in each run due to the GC column sample capacity and efficiency. The total analysis time is greatly affected by the sample injection volume. Moreover, the purity degree of the collected fraction is often unsatisfactory due to the presence of coeluted compounds. In order to provide an enhanced sample capacity, wide-bore columns (0.53 mm I.D.) are commonly used, but an excess of on-column sample amount results in overloaded peaks and decreased resolution. Aiming to reach an improvement in terms of both efficiency and resolution, a three-dimensional GC-Prep system equipped with three Deans switch transfer devices was exploited. Different stationary phases were used, providing an orthogonal selectivity for peak purification. The third GC column outlet was connected to a lab-made collection system, which allowed an easy isolation of the target volatile compounds, by means of their re-condensation into a quartz tube. The potentiality of such a heart-cutting multidimensional approach, combined with spectroscopic analysis, provides a useful starting point for the identification of possible highly valuable molecules for industrial and biological evaluations.