DEVELOPMENT, OPTIMIZATION AND VALIDATION OF ANALYTICAL METHODOLOGIES FOR THE DETERMINATION OF BIOACTIVE COMPOUNDS IN FOODS, PHARMACEUTICAL PRODUCTS AND BIOLOGICAL SAMPLES

This research topic is aimed to characterize vegetable matrices, such as agri-food products, with short term purposes (i.e., give value to these products from a nutritional and functional point of view, determination of bioactive compounds) and long term objectives (increase biodiversity for local agri-food products, contribute to point out typical agri-food products, enhance the use of functional foods with supporting scientific data). Bioactive compounds are studied also on pharmaceutical or cosmetic matrices (i.e., stability studies), and biological samples (i.e., pharmacokinetic studies).

GOALS

Set-up of selective, reliable, sensitive analytical methods for determination of bioactive compounds in complex matrices, such as food, pharmaceutical products and biological ones. From one hand, separation techniques allow identification and quantification of bioactive molecules (i.e., pharmacokinetics) and their stability and distribution in living organisms (tissues, plasma, cerebrospinal fluid) are determined. On the other hand, separation techniques have to give enough power to identify and fully characterize food matrices (mainly vegetables) and/or identify metabolites that might have a certain bioactivity.

INSTRUMENTS AND METHODS

Different analytical techniques for sample treatment (extraction of bioactive compounds) molecular identification and quantitative determination are used. Most important methodologies involve: liquid-liquid extraction with enzymatic hydrolysis, solid-phase extraction, gas chromatography-mass spectrometry (GC-MS), liquid chromatography-mass spectrometry (LC-MS). Regarding LC-MS ion interfaces, Electrospray (ESI) and Chemical ionization (APCI) are available in our laboratories.

MAIN SUBJECTS

Separation Science; Analytical Chemistry; Food Chemistry; Organic Chemistry; Pharmaceutical Chemistry.

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COLLABORATIONS

The research group has active collaborations with other groups of the same Department (Prof. A. Dalpiaz, Prof. S. Scalia), European Universities (Spain, Hungary, France) and many Italian local enterprises.