Alimentación en la era Postgenómica: ¿Quo vadis? Fundamentos y aplicaciones de Metabolómica y Alimentómica

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In this lecture, we will present the principles of Metabolomics and Foodomics including an overview of different works carried out in our laboratory following these modern strategies. The works include results on Metabolomics in Alzheimer's disease studies, the use of Foodomics for analyzing transgenic foods, Metabolomics characterization of new bioactive compounds from natural sources, and Foodomics investigations of the anti-proliferative effect of diet polyphenols against different human cancer cell lines. Whole-transcriptome microarray, proteomics and MS-based profiling and non-targeted metabolome approaches were employed to carry out the mentioned Foodomics studies. These strategies enabled: i) the identification of biomarkers for early detection of Alzheimer's disease which should allow to investigate the effect of diet compounds on this illness, ii) the investigation of the substantial equivalence of transgenic foods with their natural counterparts, iii) the characterization of new bioactive compounds and iv) the identification of several differentially expressed genes alone and/or linked to changed metabolic pathways that were modulated by diet polyphenols in cancer cells, providing new evidences at molecular level on the antiproliferative effect of natural compounds that are part of our diet. These works demonstrate the wide spectrum of possibilities and challenges that can be faced via Foodomics in the current postgenomic era.