

XV Reunión Científica de la SECyTA y VII Reunión Nacional de la SEEM

Breath Analysis: Transitioning from Bench to Bedside

Pablo Martínez-Lozano Sinues. ETH Zurich, Switzerland.

The keynote from Pablo Martínez-Lozano Sinues entitled “Breath analysis: transitioning from bench to bedside” was a magnificent talk explaining how they have got to couple a quadrupole time-of-flight mass spectrometer to analyze the air (breath from patients or volatile compounds from plants) in a real-time manner. He gave some examples about the possibilities of this coupling, such as the analysis of breath samples of patients with clock disruption, patients with obstructive sleep apnea (OSA) or the analysis of some metabolites produce by plants when they were exposed to light. In the first part of the talk, Dr. Pablo Martínez-Lozano explained the analysis of the metabolites exhaled in breath hourly for 24 hours when three volunteers were totally deprived of sleep. They found 111 features using this methodology and about 40% of them showed significant circadian modulation. In the second example, they studied the metabolic changes in the exhaled breath of different patients with OSA, and they found some metabolites (pentanal), differentially changed in breath during the disease development. Finally, he played a great video with a plant movement and the dynamic of some compounds increasing or decreasing when it was irradiated with light, concluding that the use of mass spectrometers to analyze real-time exhaled metabolites could complement the analysis of body fluids such as blood, saliva or urine.

Analytical Developments and Biomedical Applications of Capillary Electrophoresis in Non-Targeted Metabolomics.

Coral Barbas. CEMBIO (Centre for Metabolomics and Bioanalysis), Facultad de Farmacia, Campus Montepríncipe, Universidad San Pablo CEU, Madrid, Spain

The keynote from Coral Barbas entitled “Analytical Developments and Biomedical Applications of Capillary Electrophoresis in Non-Targeted Metabolomics” was the last keynote of the SECyTA 2015 congress. This talk was really nice and clear about new advances in capillary electrophoresis and its application in the metabolomics field. She started with a general introduction about omic technologies, and how these techniques have changed the way we generate new hypotheses. Briefly, some years ago hypotheses about the response of an organism to a stimuli were formulated centering at the expression level and looking for the changes in their expression and the effect in the metabolite production of the same pathway. However, the application of metabolomics for a global knowledge of the metabolism enables the possibility to formulate new hypotheses starting from the metabolism changes after a stimuli, and then, looking at the pathways that they are involved in. The general aim of the studies that apply these technologies is the discovery of reliable biomarkers of a disease state. In this sense, Dr. Coral Barbas remarked the importance of the use of complementary techniques to obtain the highest coverage of the metabolite production, and how capillary electrophoresis coupled to mass spectrometry could complement the results obtained with other platforms (liquid or gas chromatography coupled to mass spectrometry), because of its suitability to analyze ionic or polar compounds. Furthermore, after the discovery of these predictors, she mentioned the possibility to develop a faster and reproducible analysis to evaluate these compounds. Finally, she presented some works where they have successfully applied this methodology, such as the explanation of the mechanism of action of rosemary extracts in an animal model, and the relation between the serine and the appetite stimulation when hunger is absent.

Alberto Valdés