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Constructing a workflow based on breath and urinary metabolomics to go further on asthma management

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Breath and urinary-based metabolomics are centered on the capture analysis and establishment of metabolite biomarker patterns in humans towards the development of platforms that may be used as tools in a broad spectrum of medical problems. Current developments confirm the potential of this upward trend in the development of rapid, low-cost and non-invasive real-time disease diagnostic tools. Advancements in sampling methodologies and an explosion in the diversity, versatility and sensitivity of associated detection platforms have catalyzed the interest on the body fluid metabolomics studies. For instance, multidimensional gas chromatography (GC×GC-ToFMS) allowed going forward on breath and urinary metabolomics towards the understanding asthma perturbations in humans. Asthma is a heterogeneous inflammatory disorder which is now one of the commonest chronic disorders in the world and it is also associated with high direct and indirect health costs especially related with diagnosis and treatment. A particular emphasis in the talk will be placed on the more recent developments on breath and urinary asthma metabolomics towards disease management (diagnosis, disease status evaluation, follow-up therapy and personalized disease evaluation). Challenges associated with metabolomics workflow construction namely those related to the complexity of biological samples, data acquisition and processing from high throughput techniques (NMR and multidimensional gas chromatography) and search for associations between the instrumental data and metabolic pathways or clinical parameters will be also discussed.

Biography

Silvia M Rocha is an Assistant Professor in the Chemistry Department at the Aveiro University. She has done BA in Pharmaceutical Sciences at the Pharmacy Faculty (Coimbra University) and PhD in Chemistry (Aveiro University). For the last 22 years, she has performed studies on the characterization of plant-derived natural products, prospection of bioactive compounds and metabolomics applied to human fluids, plants and microbial systems. Her main skills are oriented to sample preparation and high through-put analysis based on comprehensive two-dimensional gas chromatography and mass spectrometry developments. She has published over 85 SCI papers, 2 books, 7 book chapters and 3 patent applications.

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