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Metabonomic principles, applications in the pediatric field and epidemiology

Marilyn Duquesne

University of Mons, Belgium

The composition of a large number of low molecular-weight endogenous molecules fluctuates in human biological fluid according to the physiopathological status of an individual. The spectroscopic analysis of these small molecules in diverse biofluids is called “metabonomic” and generates profiles that can be further associated with specific pathologies. Approximately 2,000 to 3,000 metabolites are relevant for early clinical diagnostics and most of them are specific for a particular biochemical pathway or patho-chemical processes. Taken together, subsets of those metabolites constitute functional fingerprints which can be useful in many clinical applications, including pediatry. Clinical metabonomic has already proved its utility in neonatology or children's medicine to predict prematurity, mode of delivery, perinatal asphyxia or neurological, kidney and respiratory diseases. Moreover, to better apprehend drugs response from adults to children, pharmacometabonomic is developed to predict drug efficacy or adverse effects and, consequently, can be used to define a safe and effective pediatric dose. Examples from the literature will be presented. Blood and urine are the most common biofluids used in metabonomics. The simplicity, safety and non-invasive collection of urine samples, makes metabonomic a very appropriate diagnostic tool in pediatric medicine. In addition, in house data obtained in a metabonomic study conducted in the context of a large-scale human kidney disease, the Balkan Endemic Nephropathy, will be presented to demonstrate the potential of this recent omics technology to highlight the mechanism of disease development or to identify biomarkers of diseases.

Biography

Marilyn Duquesne obtained a PhD grant co-funded by Prof. Joelle Nortier after completion of her Master's thesis at UMONS. She is the Head of the Department of Dialysis and Kidney Transplantation at Erasme Hospital in Belgium. This collaboration also includes the nephrology Department of Zagreb University Hospital headed by Dr Bojan Jelakovic. Some results of this current work have been published in the *Journal of Cancer Science & Therapy* or presented during international conference on traditional and alternative medicine and the kidney week of the American Society of Nephrology.

md89@live.be

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