

# Metabolomics and Diagnosis

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## Short Communication

Metabolomics deals with the study of biochemical events involving metabolites, be it molecule substrates, reaction intermediates or end products of these processes. It is a precise investigation of the little sub-atomic metabolites in a cells, tissues, biofluids, or cell culture media that are the substantial consequence of cell procedures or reactions to an ecological pressure. The metabolome is the complete supplement of metabolites present in an organic example under given hereditary, dietary or natural conditions. Metabolomics advances yield numerous bits of knowledge into fundamental organic exploration in territories, for example, frameworks science and metabolic demonstrating, pharmaceutical examination, sustenance and toxicology. Metabolomics is the logical investigation of synthetic procedures including metabolites, the little atom substrates, intermediates and results of digestion. In particular, metabolomics is the "orderly investigation of the exceptional compound fingerprints that particular cell forms abandon", the investigation of their little particle metabolite profiles. The metabolome speaks to the total arrangement of metabolites in a natural cell, tissue, organ or creature, which are the finished results of cell forms.

Advanced metabolomic profiling techniques enabled us to measure n number of metabolites in blood samples, cellular extracts and other bio-fluids, biopsies, providing with a patient specific metabolic fingerprint. These metabolic fingerprints serve as potential diagnostic/prognostic tools that significantly provide information to manage or treat critical diseases like cancer and disease related to regulation of cardiac function. Due to high number of metabolites in human metabolome, several interrelated techniques and methods are required for inclusive metabolic characterization. Techniques like nuclear magnetic resonance (NMR) and mass spectrometry (MS) combined with gas chromatography (GC) and or liquid chromatography (LC), are very

sensitive and effective to generate metabolic fingerprints of any biological sample. These metabolomes not only reflect the conditions of interest, but also food habits/diet, effects of a particular drug, sex related changes/difference, and other comorbid disease or conditions and exposures to chemicals and/or environmental irritants. As a consequence, metabolomic studies are prone to clinical confounding factors that may lead to false conclusions. Nevertheless the metabolomics to several large sample size (population study during epidemics) has allowed for robust statistical adjustments for potential confounders, and has resulted in externally reproducible findings. Additionally, metabolomics profiling has been applied for small sample size of unique clinical scenarios that allow for serial sampling before and after a controlled biological perturbation (e.g., drug doses, exercise testing, planned myocardial infarction, and so on). Further advancements in investigational techniques together with metabolomics is being associated with other "omics" platforms to obtain deeper insight into pathological interactions of biomolecules, metabolites, and disease states. Furthermore, the advanced metabolomic techniques provide us with a snapshot of the metabolic fingerprints of individual patients, which can serve as diagnostic and/or prognostic tools in identify disease induced physiological impairments as well as timing of disease specific therapies.

Thus, metabolomics is a powerful technology that is transforming our ability to predict, detect, and understand a myriad of disease states, and to monitor the effectiveness of therapeutic interventions. In doing so, metabolomics continues to advance our societal objective of personalizing the practice of medicine.

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