

Parallel Session RTD Line 2 / Nutrigenomics

Lecture 5: Metabolomics applications to dietary interventions

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Abstract

The field of metabolomics describes the global analysis of all small molecules in a given biological fluid or tissue sample. As such, metabolomics is a logical complement to the fields of transcriptomics (global gene expression) and proteomics (global protein expression) by providing additional insight into the underlying biochemistry of an organism. Moreover, metabolomics is considered by many to be the 'omic platform most representative of phenotype. While this concept is becoming increasingly accepted by the scientific community, the field of metabolomics continues to face many of the challenges previously encountered in transcriptomic and proteomic research. Potentially massive datasets are generated within a single experiment, meaning that data analysis and interpretation can be major obstacles. Furthermore, although accurate and quantitative measurements can be made, the human metabolome is not yet fully defined; therefore characterizing a newly identified metabolite can present a significant challenge. Nevertheless, the possibility of identifying a metabolite not previously associated with health and disease suggests that metabolomics is poised to make a significant impact on clinical research by identifying surrogate markers of disease. Recent studies have demonstrated that individuals have distinct metabolite profiles and that these profiles can be modulated in response to exogenous factors, such as diet. Therefore today's presentation will focus on metabolomics as it pertains to the field of nutrition, highlighting recent studies of interest as well as the potential obstacles preventing the rapid translation of metabolomic research from bench to bedside.