TECHNOLOGY

Data Normalization Strategy for Quantitative High-Throughput Metabolomic Profiling Analysis

OVERVIEW

The emerging science of Metabolomics provides technology for measuring the metabolic status and overall biochemical events associated with a cellular or biological system. It refers to the quantitative identification of free metabolite pools. The potential applications for Metabolomic technologies are very diverse, including the pharmaceutical, agricultural and industrial biotech fields. Metabolomics has the promise to enable detection of disease states and their progression, monitor response to therapy, stratify patients based on biochemical profiles and highlight targets for drug design.

Most often, finding the metabolic fingerprint of a biological system utilizes Gas Chromatography-Mass Spectrometry (GC-MS). Prior to performing metabolomic analysis of biological samples using GC-MS, the sample has to undergo chemical transformation (derivatization). It is the composition of the original sample's derivative that is measured using the GC-MS equipment. Current metabolomic analyses ignore the biases (40% in average, while they may reach 150% for some metabolites) that may be introduced in the statistical analysis, thus skewing biologically relevant conclusions. There are currently no methods to correct the metabolomic profiles for such differences, thereby decreasing significantly – for some classes of metabolites in particular – the accuracy of metabolomic analysis.

University of Maryland researchers have developed a data correction strategy, including both experimental and algorithmic components, that enables such correction and reduces the coefficient of variation in the quantification of all metabolites to 4% in average without jeopardizing the high-throughput nature of metabolomics. This is the first strategy that greatly improves the accuracy of GC-MS metabolomic analysis results. A University of Maryland start-up company will be based on this novel technology providing customized software solutions for accurate metabolomic analysis and sample analysis services.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Information Technology

EXTERNAL RESOURCES

IS-2005-017