WHICH WAY NEXT IN METABOLITE PROFILING FOR BIOMARKER DISCOVERY?

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Producing global profiles of endogenous or xenobiotic metabolites using LC-MS presents a major analytical challenge and success, even using "state-of the art" techniques, is never certain. For the profiling of endogenous metabolites for metabonomic/metabolomic studies there are many possible routes to explore, ranging from direct injection of the sample into the mass spectrometer, through rapid analysis with limited resolution, “chip” based separations and long, high resolution, gradient separations, all with or without prior sample preparation. Multi-dimensional separations are almost certainly required to obtain maximal coverage given the very wide range of polarities that are encountered in samples such as plasma, urine and tissue extracts. Strategies for sample preparation and chromatographic separation will be considered, aimed at maximising the coverage of the metabolome, together with MS-based detection.

In addition the use of novel methods for improving metabolite profiling by e.g., combining ion mobility spectrometry (IMS) together with a chromatographic separation, or using inductively plasma mass spectrometry (ICPMS) for the detection of sulphur-containing metabolites will also be described. Future developments and directions for LC-MS-based metabolite profiling research will be discussed.