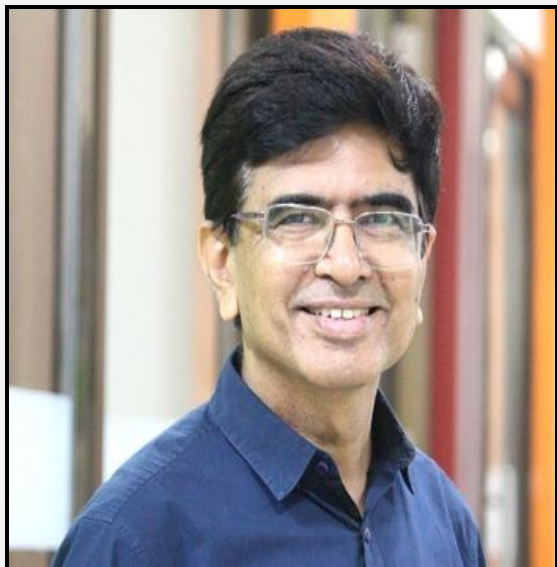




Centre for Research in Nanotechnology & Science

IIT Bombay

Two dimensional GCMS in Metabolomics - Strategies and Applications



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Abstract:

Metabolomics is the study of metabolites present within an organism, cell, tissue or biofluids. It is a rapidly emerging field, as evident from the surge in publications in the last 10 years. Metabolomics has implications in biomarker discovery, clinical and fundamental research, spent media analysis and bioprocess optimization, metabolic engineering, and many other fields. Mass spectrometry coupled to gas chromatography (GCMS) is one of the methods of choice for metabolomics studies as it can measure hundreds of compounds in a single run. Our group has developed expertise in mass-spectrometry based metabolomics of various platforms. We apply these techniques for metabolic engineering of cyanobacteria, spent media analysis and biomarker discovery.

We have developed LCMS methods to identify and quantify over 500 metabolites in human blood samples. GC x GC TOF, too, will provide higher metabolome coverage compared to a 1D GCMS due to extensive separation of analytes. These are being further used in predicting biomarkers and metabolic signatures for various complex disorders. Our group has also developed a GCMS based method to analyse spent media from the bioprocess to understand the metabolites consumed or secreted during the process by bacterial or mammalian cells. Better visibility of the media provides insights into batch-to-batch variation in productivity as well as guide efficient feed design.