Metabolomics Australia

The University of Melbourne Node, Victoria

What is Metabolomics?

Metabolomics Australia's core objective is to develop the capacity to perform high-throughput metabolomics on a scale essential to sustain our future discovery and innovation capabilities and international competitiveness in strategically important areas of the life sciences, medicine, agrifood, industry and the environment.

Metabolomics is defined as the non-targeted detection and quantification of small molecules (metabolites) in biological materials (e.g. plasma/urine/tissue/plant/microbial extracts). The resulting metabolite profiles reflect the actual cellular condition and provide useful indicators (biomarkers) of abnormalities/health, consequences of genetic engineering and adaptations to test compounds (e.g. drugs) or environmental factors, as well as a means of discovering new biomolecules (bioprospecting) and monitoring food quality.

Metabolomics requires reliable sampling and precise capture of thousands of metabolites from the biological sample of interest. The utilization of a variety of complementary analytical platforms is crucial for identifying and quantifying the large numbers of chemically diverse primary and secondary metabolites typically found in biological samples. Finally, it requires appropriate informatics for data extraction, mining and interpretation of the obtained information.

The most commonly used platforms for the detection and measurement of metabolites involves the use of gas chromatography (GC), liquid chromatography (LC), or capillary electrophoresis (CE) coupled with mass spectrometry (MS). Compounds may also be measured directly without chromatographic separation by, for example, fourier- transform ion cyclotron resonance mass spectrometry (FT-ICR-MS) and nuclear magnetic resonance spectroscopy (NMR).

Metabolomics Australia

Bioplatforms Australia

The University of Melbourne

School of Botany

bio21 institute

ACPFG Australian Centre for Plant Functional Genomics Pty Ltd

State Government Victoria Department of Innovation, Industry and Regional Development

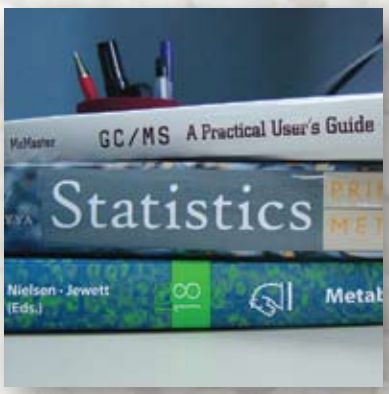
An Australian Government Initiative
National Collaborative Research Infrastructure Strategy

Metabolomics Australia

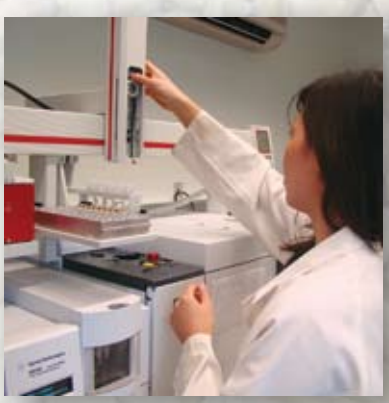
The University of Melbourne Node – Services

What are the services offered?

The Victorian node of Metabolomics Australia, located at the School of Botany (Victorian and Australian Centre for Plant Functional Genomics) and the Bio21 Institute for Molecular Science and Biotechnology, The University of Melbourne, offers an advanced analytical facility providing state-of the-art metabolomics infrastructure. The facility offers access to expertise and technologies that cover a wide range of metabolite chemistries and quantitative analyses required for comprehensive metabolite profiling applicable to biomedical, agri-food and environmental sciences.



We offer a comprehensive technology platform that includes GC-MS, LC-MS and NMR as well as a data analysis and interpretation service. Metabolomics produces large, multi-dimensional data sets that require advanced data management and processing capabilities. The informatics group is part of an embedded team of informaticians funded through the Australian Bioinformatics Facility (ABF) located at Murdoch University (Bioplatforms Australia funded), offering informatics capabilities across all nodes of Metabolomics Australia.



The facility supports a range of general service-oriented strategies such as:

- analysis of targeted or non-targeted naturally occurring metabolites
- bio-prospecting of metabolites from plant, animal and microbial systems
- comparison of genotype/SNP patterns with metabolite profiles
- advanced informatics support for metabolomic data analysis
- bioinformatics approaches to integrate systems metabolite profiling with corresponding genomic, transcriptomic and proteomic data in collaboration with the ABF
- skills training in the standardization and application of metabolomics technologies
- provide access to a well developed visitors/research hotel infrastructure to cater for external users
- promoting the uptake of the technology through workshops and conferences, and
- the development of intellectual property with commercial potential.

www.metabolomics.net.au

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