TMIC The Metabolomics Innovation Centre

Metabolomics and Immunology

Metabolomics provides a comprehensive snapshot of the metabolic processes that are occurring at any given moment. It includes endogenous metabolites, microbial metabolites, and exogenous metabolites related to environmental toxins and allergens. Immunometabolomics is an emerging field of research that intersects the important role of metabolic pathways in the immune system and during disease development. The comprehensive information that metabolomics provides offers important insight on inflammation, disease pathogenesis, disease prevention, immune-mediated disease biomarkers, and metabolic regulation of the immune system.

About Us

The Metabolomics Innovation Centre is Canada's only national metabolomics platform, and the largest of its kind. We support a wide range of state-of-the-art metabolomics technologies, databases and bioinformatics tools. TMIC provides a single-source destination for access to leading metabolomics expertise and extensive technological capabilities for global metabolome profiling of >10,000 biologically relevant metabolites. More than 1,000 metabolites from key metabolic pathways can be quantified. We also provide global lipodome analysis of >7,000 lipids from more than 15 different lipid classes.

As a core facility rooted in universities across Canada, TMIC offers the best of both academia and industry. Our experts are at the forefront of metabolomics research and are continually improving, expanding and optimizing services and technologies. As a business, TMIC guarantees high quality and reproducible data as well as high customer-service standards. In addition, TMIC will be offering ISO 15189 certified facilities in Fall 2020 which will be directly integrated within clinical testing facilities to facilitate translation of high impact metabolomics discoveries.

Our Services

TMIC offers high throughput, low cost and extremely comprehensive services for discovery research, chemical phenotyping, and analysis of biological pathways. Our technologies are compatible with a wide range of samples, including human and animal biofluids, fecal samples, cell extracts and cell culture media, and tissue and can accommodate small volumes.

Example applications

- Microbiome profiling
- Characterization of tumor microenvironment
- Biomarker identification and validation for disease risk, early screening and diagnostics
- Immune cell metabolism: glycolysis, TCA cycle, pentose phosphate pathway, fatty acid oxidation, fatty acid synthesis and amino acid metabolism
- Metabolic profiling of cancer cells and cancer biomarkers
- Lipidomics for lipid-mediated immune responses
- Precision diagnostics and therapeutic response
- Patient stratification
- Disrupted metabolism in autoinflammatory and autoimmune diseases
- Host cell metabolic response to microbial infection
- Measurement of environmental toxins in human biofluids
- Metabolic changes in relationship to dietary intervention

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