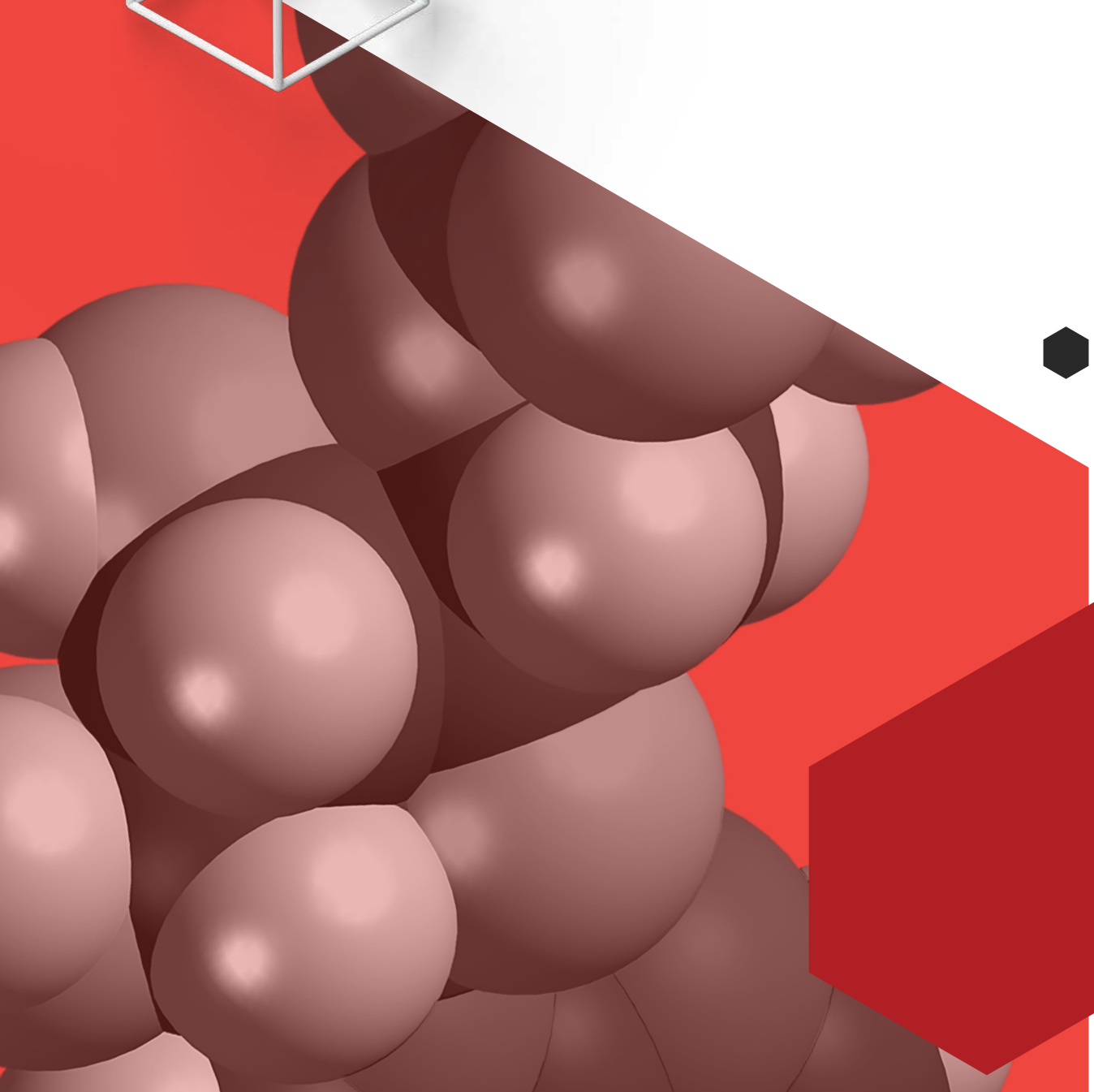
VICTOR CHANG
CARDIAC
RESEARCH
INSTITUTE
INNOVATION
CENTRE

Metabolomics Facility



Metabolomics Facility

Metabolomics analysis is undertaken with the aim of measuring as much as possible of the known and unknown metabolite complement (metabolome) of a cell, tissue or biofluid. In the context of cardiovascular disease the goal of metabolomics analysis is to discover metabolite markers that can be used to indicate or predict the onset and progression of disease, and/or the biochemical mechanisms behind it.

State-of-the-art liquid chromatography-mass spectrometry systems at the Victor Chang Cardiac Research Institute Innovation Centre's Metabolomics Facility will enable researchers to measure the metabolome in a variety of samples in both targeted and untargeted modalities.

The targeted instruments are used to measure several hundred known metabolites and to provide accurate concentrations, allowing changes in metabolite levels to be put into context of biochemical pathways and upstream proteome/genome perturbations.

The untargeted instruments are capable of measuring several thousand known and unknown metabolites in a single sample, with the aim of discovering new unknown compounds related to disease, or new disease-related associations of known metabolites for biomarker discovery.

Regarded as the final part of the biological jigsaw, metabolomics can provide insight and mechanistic understanding of the pathophysiology of cardiovascular disease at the biochemical level, paving the way for predictive/diagnostic markers as well as possible therapeutic targets.

UHPLC-Agilent 6470 QQQ

Liquid Chromatography-Mass Spectrometry System (Agilent)

This system comprises an Agilent 1290 Infinity II ultra-high-performance liquid chromatograph coupled to an Agilent 6470 triple quadrupole mass spectrometer, primarily for targeted profiling of central metabolism. The method measures >200 metabolite intermediates from glycolysis, the tricarboxylic acid cycle, the pentose phosphate pathway, nucleotides, organic acids and many others.

UHPLC-Agilent 6495 QQQ

Liquid Chromatography-Mass Spectrometry System (Agilent)

Comprising of an Agilent 1290 Infinity II ultra-high-performance liquid chromatograph coupled to an Agilent 6495 triple quadrupole mass spectrometer, this configuration is primarily for targeted analysis of several pathway- or class-specific targeted assays such as acyl carnitines, amino acids, and the NAD biosynthesis pathway.

UHPLC-SCIEX TripleToF 6600

Liquid Chromatography-Mass Spectrometry System (Agilent-SCIEX)

This system comprises an Agilent 1290 Infinity II ultra-high-performance liquid chromatograph coupled to a SCIEX TripleTOF 6600 quadrupole time-of-flight mass spectrometer. This mass spectrometer has both electrospray and chemical ionisation interfaces to enable the capability of different ionisation strategies where required.

The system will be used for reversed phase-, HILIC- and lipidomic-based separations, and analysis of the metabolome and lipidome using both untargeted and semi-targeted strategies. The SCIEX TripleTOF can be used to acquire data in MS1, IDA and DIA (SWATH) modes for a comprehensive analysis and "digital record" of the samples under investigation.

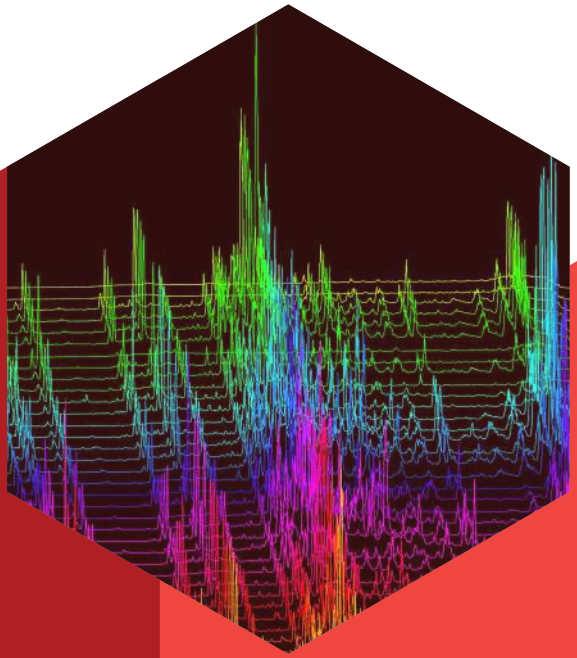
SFC-Agilent 6560 IM-Q-ToF

Liquid Chromatography-Mass Spectrometry System (Agilent)

The Agilent 6560 ion mobility quadrupole time-of-flight liquid chromatography-mass spectrometer offers an alternative to standard LC separations and time-of-flight mass spectrometry.

The ion mobility front end of the mass spectrometer provides the possibility of another dimension of separation for isomers and/or isobars to aid in resolution of problematic separations, as well as to provide more information for compound identification.

This system can also be coupled to an Agilent 1290 Infinity II ultra-high performance liquid chromatograph for standard LC-based separations, as required.



The power of discovery

The Victor Chang Cardiac Research Institute Innovation Centre is heralding a medical research revolution.

Proudly supported by the NSW Government, the Innovation Centre gives researchers access to state-of-the-art equipment and cutting-edge technologies, including two MRI scanners, a series of mass spectrometers, micro-CT, iPSC automated robotics and a cryo-electron microscope.

The Victor Chang Cardiac Research Institute Innovation Centre is pushing the boundaries of knowledge by facilitating a new era of collaboration between researchers across the state and the Asia Pacific, transforming the landscape of cardiovascular research.

Enquire about the Metabolomics Facility

Esther Kristianto
Metabolomics Facility

E e.kristianto@victorchang.edu.au

Level 5, Lowy Packer Building
405 Liverpool Street
Darlinghurst NSW 2010
Australia

www.victorchang.edu.au/Innovation-Centre