

1st International Mass Spectrometry Imaging Society Conference



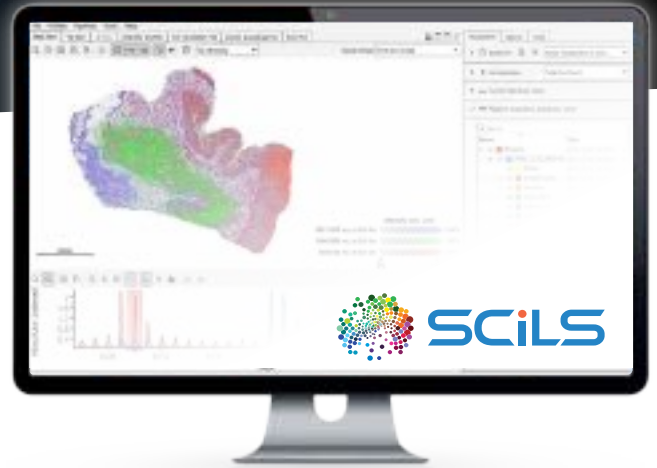
October 23–25, 2023.

Centre Mont-Royal, 2200 rue Mansfield, Montreal, QC Canada

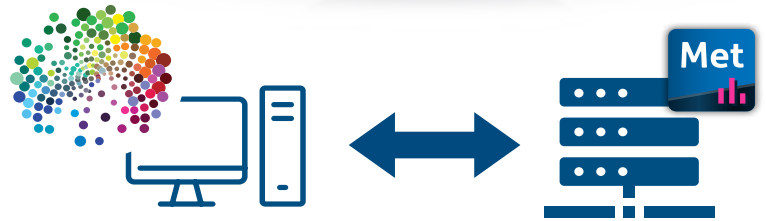
2023
AGENDA



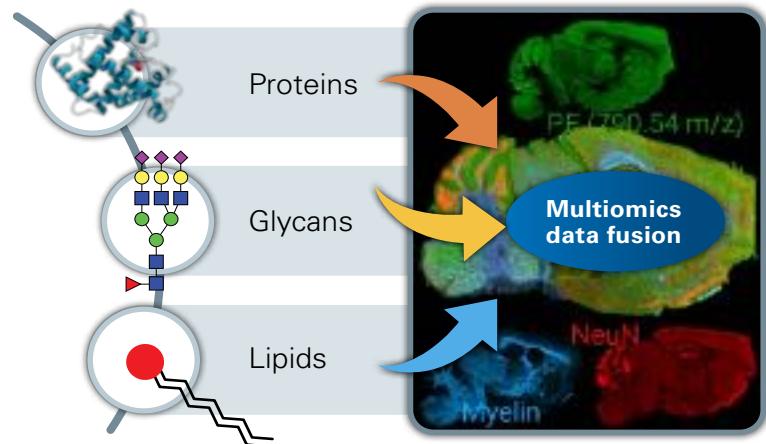
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1st International Mass Spectrometry Imaging Society Conference (IMSIS 2023)

October 23-25, 2023
Centre Mont-Royal, 2200 rue Mansfield, Montreal, QC Canada

WELCOME

Dear Friends and Colleagues,

We are delighted to welcome you to IMSIS 2023, the 1st Conference of the International Mass Spectrometry Imaging Society organized in Montreal, Quebec, Canada.

This is the first meeting of the of the newly formed International Mass Spectrometry Imaging Society which is comprised of the Mass Spectrometry Imaging Society (MSIS) (Europe) and the Imaging Mass Spectrometry Society (IMSS) (North America). As with the past jointly organized OurCon conferences, this conference is a global forum on mass spectrometry imaging research.

The environment of the event will be one of creativity, cutting edge technology, and scientific advancement. IMSIS 2023 plans to highlight the latest advances in the field of mass spectrometry imaging, promote research of students and new investigators, and acknowledge the top scientists who have helped to cultivate this innovative atmosphere over the years. It will offer a unique opportunity for scientific exchange, and plethora of accelerating networking opportunities for young scientists through lectures, posters, and impromptu meetings with leaders in the field.

We look forward to seeing you in Montreal at the Centre Mont-Royal!

Dr. Pierre Chaurand,
Université de Montréal,
Local Organizer
October 23, 2023

Co-organized with the International Mass Spectrometry Imaging Society:

Martina Marchetti-Deschmann, TU Wien
Malcolm R. Clench, Sheffield Hallam University
Liam McDonnell, FP Science
Tiffany Siegel, Boehringer Ingelheim Pharma GmbH
Christopher Anderton, Pacific Northwest National Laboratory
Peggi Angel, Medical University of South Carolina
Richard R. Drake, Medical University of South Carolina

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AGENDA

*subject to change

Monday, October 23, 2023	
08:00	Registration Desk Opens All sessions take place in Mont-Royal I & II
08:30 - 11:30	Workshop #1 - Bruker, pre-registration required Mont-Royal I User Meeting - Shimadzu, by invitation only Mont-Royal II
11:30 - 12:00	Break - Plenary Room closed
12:00 - 13:00	Lunch Workshop presented by Waters Mont-Royal I & II 100 Lunches Available first come first serve; Lunch will also be available in the Foyer
WELCOME	
13:00 - 13:40	Plenary Lecture - Malcolm R. Clench, Sheffield Hallam University <i>Advances in mass spectrometry imaging 2000-2023</i>
13:40 - 15:20	Session 1 - Instrumentation & Methods I (MALDI) Chair: Shane Ellis, University of South Australia
13:40 - 14:00	Martin Dufresne, Vanderbilt University MSRC <i>Sublimated/annealed aminated cinnamic acid analogues for high sensitivity sub 10 μm spatial resolution MALDI IMS of lipids in human tissues</i>
14:00 - 14:20	Mengze Zhang, University of Zürich <i>Toward hyper-multiplexed proteomics imaging by MALDI-IHC technology</i>
14:20 - 14:30	Ian Anthony, Maastricht University <i>Fast mass microscopy for 1,000-fold faster mass spectrometry imaging</i>
14:30 - 14:40	Andrej Grgic, Maastricht University <i>Design and performance characterization of a novel MALDI-2-MSI ionization source with transmission and reflective mode capabilities</i>
14:40 - 14:50	Matthew O'Rourke, The University of Technology Sydney <i>Expanding peptide detection in MALDI MSI using ion mobility MS and matrix phase fractionation</i>
14:50 - 15:00	Josiah Rensner, Iowa State University <i>In-source hydrogen-deuterium exchange in MALDI-MSI to assist metabolite annotation</i>
15:00 - 15:10	Peter Verhaert, ProteoFormiX <i>High resolution mass spectrometry imaging (MSI) of neurotransmitters in (human) FFPE neuronal tissues without chemical derivatization: eventuality or utopia?</i>
15:10 - 15:20	Sponsored Talk: AmberGen Presented by: John Gillespie, <i>Latest Advancements in MALDI HiPLEX-IHC</i>

Monday, October 23, 2023, continued

15:20 - 15:50	Coffee Break - Foyer with Posters & Exhibits
15:50 - 17:20	Session 2 - Instrumentation & Methods II (SIMS) Chair: Martina Marchetti-Deschmann, TU Wien
15:50 - 16:10	Felicia Green, Rosalind Franklin Institute <i>Enhancements in the use of SIMS for multi-omic biomolecular mass and structural analysis</i>
16:10 - 16:20	Edith Sandström, Maastricht University <i>Steps toward fast mass microscopy of immunolabelled samples</i>
16:20 - 16:40	John Fletcher, University of Gothenburg <i>SIMS and electrochemistry correlate dose dependent alterations on cells</i>
16:40 - 17:00	Martin Metodiev, National Physical Laboratory <i>Measuring spatial resolution of different mass spectrometry imaging modalities</i>
17:00 - 17:10	Sponsored Talk - IONOPTIKA Presented by Kate McHardy <i>Advances in, and applications of, Gas Cluster Ion Beam (GCIB) SIMS</i>
17:10 - 17:20	Sponsored Talk - SunChrom/Mass Tech Presented by Gilles Frache, LIST <i>Atmospheric Pressure MALDI coupled to Orbitrap(s), principle and applications</i>
17:20 - 19:00	Session 3 - Instrumentation & Methods III (LDI, Ambient) Chair: Yoichi Otsuka, Osaka University
17:20 - 17:40	Daniel Simon, Imperial College of London <i>Ambient laser desorption – REIMS with novel picosecond laser sources for sample preparation-free imaging</i>
17:40 - 18:00	Michal Žalud, Masaryk University <i>Detection and characterization of individual Au nanoparticles using SubAP LDI MSI</i>
18:00 - 18:20	Arash Zarrine-Afsar, University Health Network <i>On the concordance of molecular and morphometric cancer borders: insights from mass spectrometry imaging of cancer lipids</i>
18:20 - 18:30	Christoph Bookmeyer, University of Tarragona <i>Metal nanolayers combined with SPICl postionization for enhanced spatial metabolomics in the low mass range</i>
18:30 - 18:40	Leonidas Mavroudakos, Uppsala University <i>Identification and imaging of prostaglandin isomers utilizing MS3 product ions and silver cationization</i>
18:40 - 18:50	Yoichi Otsuka, Osaka University <i>Mass spectrometry imaging of single cells by tapping-mode scanning probe electrospray ionization</i>
18:50 - 19:00	Sponsored Talk - Shimadzu Presented by M. Nazim Boutaghou <i>Shimadzu: One-stop shop for your imaging needs</i>
19:00 - 22:00	Opening Reception & Evening Poster Session #1 4th Floor Foyer Mont-Royal I & II Even Poster Number presenters must be at their posters from 20:00 to 21:30

Tuesday, October 24, 2023

07:30	Registration Desk Opens
08:00 -08:40	Plenary Lecture - Yasser Riazalhosseini, McGill University <i>Spatial transcriptomics to understand molecular underpinnings of aggressive phenotypes in tumors</i>
08:40 - 10:20	Session 4 - Lipids, Metabolites & Glycans Chair: Richard Drake, Medical University of South Carolina
08:40 - 09:00	Jayden Mckinnon, University of Wollongong <i>Enhanced coverage and spatial resolution for the mass spectrometry imaging of small metabolites using MALDI-2</i>
09:00 - 09:20	Stefania Alexandra Iakab, CeMOS - Center for Mass Spectrometry and Optical Spectroscopy <i>(3D) Molecular snapshots of spheroids by mass spectrometry imaging</i>
09:20 - 09:40	Keziah Liebenberg, Baylor College of Medicine <i>Insights into metabolic alterations associated with resistance to immune checkpoint inhibitors in triple negative breast cancer utilizing DESI-MSI</i>
09:40 - 09:50	Laurentiu Dabija, York University <i>Assessment of MALDI matrices for phosphoinositide detection in mouse kidney models through matrix-assisted laser desorption ionization (MALDI) imaging techniques</i>
09:50 - 10:00	Anthony Devlin, Rosalind Franklin Institute <i>Mass spectrometry imaging of glycosaminoglycans: current progress and future prospects</i>
10:00 - 10:10	Elizabeth Wallace, Medical University of South Carolina <i>A MALDI MSI N-glycome atlas and analytic pipeline for human normal and cancer tissues</i>
10:10 - 10:20	Sponsored Talk - HTX Imaging Presented by Alyson Black, PhD <i>Advances in Sample Preparation for Ultra-High Spatial Resolution MALDI Imaging</i>
10:20 - 10:40	Coffee Break - Foyer with Posters & Exhibits
10:40 - 12:10	Session 5 - Proteins and PTMs Chair: Peggi Angel, Medical University of South Carolina
10:40 - 11:00	Helen Cooper, University of Birmingham <i>Native ambient mass spectrometry imaging: Applications in understanding amyotrophic lateral sclerosis</i>
11:00 - 11:10	Matthew Briggs, The University of South Australia <i>Integrating N-glycan and tryptic peptide MALDI mass spectrometry imaging with N-glycopeptide LC-MS/MS data for FFPE endometrial cancer tissue</i>
11:10 - 11:20	Tana Palomino, North Carolina State University <i>Preserving and predicting sialic acid content of N-linked glycans by IR-MALDESI</i>
11:20 - 11:30	Jade Macdonald, Medical University of South Carolina <i>Identification of unique extracellular matrix signatures that differentiate hepatocellular carcinoma by outcome</i>
11:30 - 11:50	Andreas Roempp, University of Bayreuth <i>Advances in MALDI imaging of tryptic peptides: improved spatial resolution in mammalian tissue and first results for plant proteins</i>
11:50 - 12:10	Kevin Schey, Vanderbilt University <i>Localization of membrane proteins and post-translational modifications in ocular tissues</i>

Tuesday, October 24, 2023, continued

12:10 - 13:10	<p>Lunch Workshop presented by: Thermo Fisher Scientific; <i>Focus your MSI-research: Coupling the power of high lateral and high mass resolution with AP-SMALDI⁵ AF ion source and Orbitrap Exploris MS</i> 100 Lunches Available first come first serve; Lunch will also be available in the Foyer</p>
13:10 - 14:50	<p>Session 6 - Novel Biological Application Chair: Shuichi Shimma, Osaka University</p>
13:10 - 13:30	<p>Julia Haddow, University of Dundee <i>Chagas' disease - tissue clearing and mass spectrometry to study parasite localisation and drug distribution in trypanosoma cruzi infected mouse tissues</i></p>
13:30 - 13:50	<p>Max Alexander Müller, Justus Liebig University Giessen <i>Lipid signatures and inter-cellular heterogeneity of naïve and lipopolysaccharide-stimulated human microglia-like cells using AP-SMALDI MSI at 1.5 µm lateral resolution</i></p>
13:50 - 14:10	<p>Shadrack Mutuku, University of Wollongong <i>Omics-scale quantitative mass spectrometry imaging of lipids using a multi-class internal standard mixture combined with MALDI and MALDI-2</i></p>
14:10 - 14:20	<p>Rachel Pryce, Université de Montréal <i>A spatial multi-omics investigation into spinal cord remodeling in mouse mutant strains with altered myelin basic protein abundance</i></p>
14:20 - 14:30	<p>Gabor Toth, Uppsala University <i>Correlation between oxylipin species and lesion formation in human multiple sclerosis revealed by silver-doped PA nano-DESI imaging</i></p>
14:30 - 14:40	<p>Bin Yan, National Physical Laboratory <i>Uncovering metabolic signatures associated with the invasiveness of metastatic melanoma by DESI MSI</i></p>
14:40 - 14:50	<p>Sponsored Talk - Aspect Analytics Presented by Alice Ly <i>Dedicated Software to Support High Throughput Spatial Multi Omics Applications</i></p>
14:50 - 16:20	<p>Session 7 - Pre-Clinical & Clinical Applications Chair: Masaya Ikegawa, Doshisha University</p>
14:50 - 15:10	<p>Per Andrén, Uppsala University <i>Mass spectrometry imaging of brain signalling systems reveals abnormal alterations induced by parkinsonism and L-DOPA-induced dyskinesia</i></p>
15:10 - 15:30	<p>Gerard Baquer, Brigham & Women's Hospital, Harvard Medical School <i>Understanding spatial relationships among cells and molecules in glioblastoma through multimodal imaging</i></p>
15:30 - 15:50	<p>Erin Seeley, University of Texas at Austin <i>Mass spectrometry imaging reveals molecular changes associated with aging in pancreatic cancer</i></p>
15:50 - 16:00	<p>Jordan Hartig, Medical University of South Carolina <i>Multi-fucosylated N-glycans detected by MALDI-MSI in tissues distinguish neuroendocrine prostate cancers from all stages of adenocarcinomas</i></p>
16:00 - 16:10	<p>Maiko Okamura, Doshisha University <i>Deciphering Immunometabolism in delta-sarcoglycan deficient hamster with thoracic Mass Spectrometry Imaging (tMSI)</i></p>
16:10 - 16:20	<p>Sponsored Talk - Thermo Fisher Scientific Presented by Maciej Bromirski, Sr. Project Manager, Thermo Fisher Scientific <i>MS Imaging meets Orbitrap Technology</i></p>

Tuesday, October 24, 2023, continued

16:20 - 16:50	Coffee Break - Foyer with Posters & Exhibits
16:50 - 18:20	Session 8 - MSI Data Analysis & Bioinformatics Chair: Liam McDonnell, FP Science
16:50 - 17:10	Lukasz Migas, Delft University of Technology <i>Qu-Cee: An automated quality control pipeline for cohort and 3D imaging mass spectrometry</i>
17:10 - 17:30	Nico Verbeeck, Aspect Analytics <i>Enabling integrative spatial multi-omics data analysis via dedicated data structures and interactive, web-based visualizations</i>
17:30 - 17:50	Lalin Theverapperuma, Expert Intelligence <i>Integration of topological data analysis with contrastive deep learning for molecular co-localization in mass spectrometry imaging</i>
17:50 - 18:00	Alexandria Sohn, North Carolina State University <i>A statistical approach to system suitability testing (SST) for mass spectrometry imaging</i>
18:00 - 18:10	Sai Srikanth Lakkimsetty, Northeastern University <i>Unsupervised co-registration of hematoxylin and eosin (H&E) stained microscopy images and mass spectrometry images (MSI) with feature filtering</i>
18:10 - 18:20	Oliver Hale, University of Birmingham <i>High-throughput m/z-to-mass deconvolution of protein complexes up to 145 kDa from native protein mass spectrometry imaging datasets</i>
18:20 - 19:20	IMSIS Board Meeting
19:20 - 22:00	Evening Poster Session #2 4th Floor Foyer Mont-Royal I & II Odd Poster Number presenters must be at their posters from 20:00 to 21:30.



It is a great pleasure to inform you on the recent launching (in January 2022) of the CNRS Research Network on Mass Spectrometry

Imaging (GdR-MSI, GDR2125) funded for 5 years. The GdR is a key tool of the French National Center for Scientific Research (CNRS) to promote exchanges between the main laboratories in a specific field together with academic partners (42 laboratories) but also industrial partners (17 companies). It is first focused to partners localized in France but it might be opened to key international stakeholders. The CNRS GdR-MSI aims to establish

strong relationships within the community of around two hundred scientists in France focusing their experimental work around two main instrumental subcommunities, namely that around MALDI, DESI and LA ICP-MS, as well as that on surface analysis using SIMS (ToF-SIMS and magnetic SIMS).

The Scientific Board of the GdR-MSI, with Nicolas Desbenoit (CNRS and Bordeaux University) as Director, and Alain Brunelle (CNRS and Sorbonne University) & David Touboul (CNRS and Paris-Saclay University) as Deputy Directors, includes 19 scientists reflecting the variety of the entire community of mass spectrometry imaging users at the French level. Its main missions are the following ones:

- Bring together the entire French community active in mass spectrometry imaging,
- Make our community visible and attractive at national and European levels,
- Discuss on common and transverse interest topics,
- Share approaches and methods considering the modalities as well as applications,
- Foster collaborations between network teams and facilitate the emergence of national and international projects,
- Reinforce interaction between network teams and industrial partners,
- Help young scientists by promoting their mobility through intra-network exchanges, or by providing grants to attend conferences related to the MSI field.

To achieve these goals, the GdR-MSI has already started its activities: creation of the Board, setting up a web site (<https://gdr-msi.cnrs.fr/gdr-msi/>), LinkedIn social network (<https://www.linkedin.com/groups/12723584/>), publication of a Newsletter, , organization of webinars with international colleagues (Prof. S. Van Nuffel from M4i at Maastricht University, Prof. P. Chaurand from Université de Montréal, Prof. M. Marchetti-Deschmann from TUV, etc.), as well as organization each year of a 2 days workshop: the first one was held in Bordeaux in 2022 and this year we went to Lille.

*sponsored advertisement

Wednesday, October 25, 2023

07:30	Registration Desk Opens
08:00 -08:40	Plenary Lecture - Livia Schiavinato Eberlin, Baylor College of Medicine <i>Imaging metabolites and lipids in cancer tissues to help inform treatment options for patients</i>
08:40 - 10:10	Session 9 - Xenobiotics, Kinetics, Toxicity Chair: Malcolm R. Clench, Sheffield Hallam University
08:40 - 09:00	Claire Vilette, PIMS, IBMP, CNRS <i>In situ localization of micropollutants, their transformation products and the associated stress response in plant leaves using MALDI-FTICR-imaging</i>
09:00 - 09:10	Andrew Bowman, AbbVie <i>Quantification of a potential pharmaceutical in a time course study of rat liver with mass spectrometry imaging</i>
09:10 - 09:30	Rian Griffiths, The University of Nottingham <i>Tracking drug delivery in vivo via imaging approaches</i>
09:30 - 09:40	Chloe Spencer, Sheffield Hallam University <i>Improved performance of a milli fluidic system for drug absorption studies using ex vivo tissue and mass spectrometry</i>
09:40 - 10:00	Carolin Morawietz, Justus Liebig University <i>Imaging of drugs and lipids in the parasite fasciola hepatica using high-resolution AP-SMALDI MSI</i>
10:00 - 10:10	Mark Towers, Waters Corporation <i>Increased level of detection of the drugs/metabolites biolocalisation with targeted DESI MRM TQ mass spectrometer</i>
10:10 - 10:40	Coffee Break - Foyer with Posters & Exhibits
10:40 - 12:00	Session 10 - Microorganisms, Plants & Non-Mammalian Systems Chair: Christopher Anderton, Pacific Northwest National Laboratory
10:40 - 11:00	Nanna Bjarnholt, University of Copenhagen <i>Exploring the potential for MALDI-2 post-ionization based visualization of lowly abundant phytohormones in plant tissues</i>
11:00 - 11:10	Annika Mocosch, Justus Liebig University Giessen, Germany <i>High-resolution AP-SMALDI imaging of endogenous neurotransmitters in infectious worm couples causing schistosomiasis (bilharzia)</i>
11:10 - 11:30	Laura Sanchez, University of California, Santa Cruz <i>A label free approach for relative spatial quantitation of c-di-GMP in microbial biofilms</i>
11:30 - 11:50	Dusan Velickovic, Pacific Northwest National Laboratory <i>4-APEBA on tissue chemical derivatization for enhanced MALDI MSI of carbonyls in environmental samples</i>
11:50 - 12:00	Khaled Madhoun, University of Toronto <i>Towards subcellular sampling via impulsive laser ablation coupled to mass spectrometry</i>
12:00 - 13:10	Luncheon Served - 4th Floor, Mont-Royal I & II Foyer

Wednesday, October 25, 2023, continued

13:10 - 15:30	Session 11 - Multimodal MSI Chair: Marten Snel, South Australian Health and Medical Research Institute
13:10 - 13:30	Martina Marchetti-Deschmann, TU Wien <i>Correlating tissue biomechanics and molecular information – the combination of physiological AFM and MALDI MSI</i>
13:30 - 13:50	Xander Spotbeen, KU Leuven <i>Investigation of prostate cancer heterogeneity using a novel spatial multi omics pipeline integrating MS imaging and spatial transcriptomics</i>
13:50 - 14:10	Sponsored Talk - Bruker Presented by Azad Eshghi, Field Applications Support Scientist <i>Multimodal Imaging Analysis for Comprehensive Biological Information</i>
14:10 - 14:20	Paul Trim, South Australian Health and Medical Research Institute <i>MALDI-MSI lipidomics guided LCM proteomics on human prostate cancer biopsies: maximising the data from a single section.</i>
14:20 - 14:40	Laurine Lagache, PRISM - Inserm U1192 <i>New method machine process to unravel tissue biomarkers and validate it by multiplex MALDI IHC</i>
14:40 - 14:50	Jens Soltwisch, University of Münster <i>An integrated t-MALDI-2 ion source with In-source bright-field and fluorescence microscopy for direct correlative imaging at the cellular level</i>
14:50 - 15:00	Gregory Vandergrift, Pacific Northwest National Laboratory <i>Peak ambiguities and in-source fragmentation: how many peaks in mass spectrometry imaging experiments are biologically meaningful?</i>
15:00 - 15:10	Isabeau Vermeulen, University of Maastricht <i>Discovering the molecular secrets of epilepsy: multimodal molecular imaging in a focal cortical dysplasia animal model</i>
15:10 - 15:30	Sponsored Talk - Waters Presented by Emrys Jones, Waters Corporation <i>DESI MS imaging at the cellular level with nano-flow and multi-focus approaches</i>
15:30 - 16:00	Coffee Break - Foyer with Posters & Exhibits
16:00 - 17:30	Session 12 - MSI Reporting & Standards Chairs: Heath Patterson, Aspect Analytics Andreas Römpf, University of Bayreuth Alison Scott, University of Maryland, Baltimore
	Session Content TBA
17:30 - 17:45	Awards Presentation and Closing Remarks

Providing service and support for research in the areas of mass spectrometry imaging, metabolomics, functional proteomics, and quantitative proteomics.

Proteomics – Biomarker Discovery & protein characterization

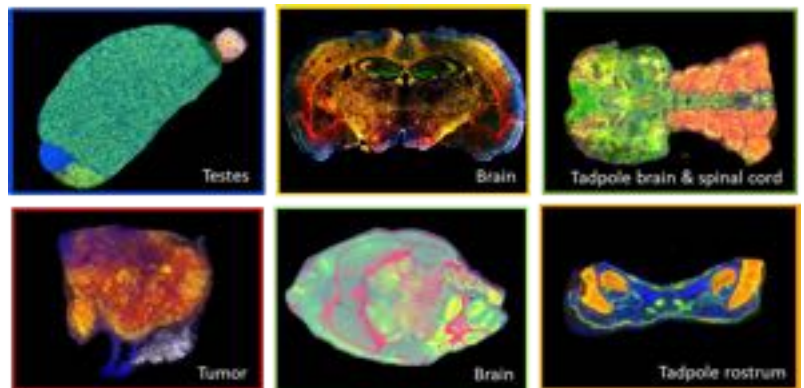
- Targeted Quantitation
- Untargeted Quantitation
- PTM Analysis
- Hydrogen-Deuterium Exchange (HDX)

Metabolomics

- Untargeted analyses
- Targeted assays: >25 Pathway and Class specific multiplexed assays
- Customization available

MALDI Tissue Imaging

- Untargeted identification of Regions of Interest
- Targeted quantification of lipids, small molecules or peptides
- HiPLEX targeted protein localization via antibody probes



The UVic Genome BC Proteomics Centre is a not-for-profit analytical MS laboratory, offering fee-for-service, technology development and collaborative research opportunities to >150 global academic and industrial clients per year. For more information, visit us at www.proteincentre.com or contact us at info@proteincentre.com.

We wish to thank our Sponsors for their generous support of the 1st IMSIS Conference, Montreal, Canada 2023

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