

Dear Faculty, Postdocs & Grad Students,

This Friday, January 19th, the Department of Chemistry will welcome Professor J. Rafael Montenegro-Burke, from the UofT, who will give the next Colloquium Series talk. Please see the details below:

Date: Friday, January 19, 2024 at 10:00 am

Title: **Mapping the Human Metabolome for Functional Metabolomics**

Host: Professor Prof. Mark Nitz

Location (in person): Davenport East, 3rd Floor, (Room 380) [Lash Miller Building](#)

Location (virtual): Join Zoom Meeting <https://utoronto.zoom.us/j/86092773171> Meeting ID: 860 9277 3171
Passcode: 802024



Abstract: In recent years, significant efforts have been focussed into understanding metabolic reprogramming in cancer with the hope of discerning context-specific biology that is exploitable for either for diagnosis or treatment. While some generalized phenomena such as the 'Warburg Effect' have been identified, the metabolic landscape of cancer is highly heterogeneous, as tumors from the same sub-type can exhibit vastly different metabolic profiles, which can influence disease progression and response to treatments.

As research begins to study how generalized treatments fail for specific patients and cancers, we need to understand what makes specific cancer lineages unique, in order to identify potential vulnerabilities with a greater level of precision. While other 'omics fields have quantified the expression of genes, transcripts and proteins of hundreds of tissue and cell types, our understanding of the metabolic composition of human cells remains rudimentary, and only a limited number of

highly targeted metabolite maps of cancer cell lines currently exist.

Our work focuses on addressing this limitation by systematically mapping the metabolomes of a broad range of human cell lines including patient derived cancer cell lines using large scale LC-MS-based metabolomics and lipidomics analyses. With hundreds of mapped metabolites, these maps have yielded valuable insights into the metabolites that are highly specific to individual cell types and diseases (i.e. biomarkers) as well as cancer-selective metabolic vulnerabilities and 'choke-points' for specific cancer lineages, leveraging existing drugs and chemical inhibitors with wide therapeutic windows.

Bio: Rafael (Rafa) Montenegro Burke earned his PhD in chemistry at Vanderbilt University under the guidance of in Dr. John A. McLean, focusing on the analysis of complex biological samples using ion mobility-mass spectrometry. From 2016–2020, he was a postdoctoral fellow in the laboratory of Dr. Gary Siuzdak at The Scripps Research Institute in La Jolla, CA, where he focused on solving current challenges in the identification of unknown metabolites and their corresponding biological function/activity in disease. He joined the faculty of the Donnelly Centre for Cellular and Biomolecular Research at the University of Toronto as an assistant professor in the Fall of 2020 and is a Canada Research Chair in Functional Metabolomics and Lipidomics. The Montenegro Burke laboratory focuses on the development and application of mass spectrometry and bioinformatics approaches to functionally characterize the metabolome and discover novel metabolic vulnerabilities and therapeutic opportunities for disease.

This seminar will be hosted by Prof. Mark Nitz and will be held in-person and virtual (hybrid). It will not be recorded.

If you are a student at UTM and UTSC and would be interested in attending this colloquium in person (travel expenses covered), please send your request to chem.reception@utoronto.ca.

All are encouraged to attend!

Best
Keisha

Keisha Cokely

Administrative Assistant, Department of Chemistry | Faculty of Arts & Science

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I respectfully [acknowledge this land on which the University of Toronto operates](#). For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.