

MULTIOMICS WORKFLOWS FOR BIOMARKER DISCOVERY IN DISEASE MODELS
Lekha Sleno, Nathan Ghafari, Oriana Zambito, Maggy Lépine. Chemistry department/CERMO-FC, University of Quebec in Montreal (UQAM)

Our recent work on implementing untargeted and targeted metabolomics and proteomics will be presented. Metabolomics and proteomics provide complementary information for a better understanding of the mechanisms underlying specific pathological states by studying what biological pathways are dysregulated in model of diseases. We have developed a multiomics approach to study different mouse models of disease, including mucopolysaccharidosis type 2, polycystic ovary syndrome, and Hirschsprung's disease. A combination of untargeted and targeted metabolomics as well as untargeted proteomics methods were used to observe metabolic variations in different sample types, including liver, colon, feces and plasma. In each case, we have identified several putative metabolites and proteins that are significantly different in the disease model compared to the control wild-type mouse. We also have investigated the effect of specific treatments of each of these diseases, and whether the metabolite or protein levels are reestablished to control levels or not. This approach can help find biomarkers of disease, decipher pathways that are perturbed as a consequence of the disease and examine if any of these biomarkers can be indicative of a positive treatment response. This presentation will discuss the advantages of combining different datasets in multi-omics workflows.

Biography:

Lekha Sleno received her PhD in 2006 from Dalhousie University with Dietrich Volmer at NRC in Halifax, NS. She then completed two post-doctoral stays, at the University of Geneva and the University of Toronto, before joining the chemistry department at UQAM in 2008. She is currently a Full Professor and UQAM Bioanalytical Strategic Research Chair, where her research interests include developing novel analytical workflows for biomarker discovery and exposomics research using mass spectrometry. She is also co-director of the Centre for Excellence in Research of Orphan Diseases – Fondation Courtois (CERMO-FC).