

Department of Geology

Doctoral Research Proposal Defence



Saint Mary's
University
SCIENCE

***Environmental lipidomic baseline survey of deep marine
sediments in the Scotian Margin***

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Science 411

Supervisor:

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Environmental lipidomic baseline survey of deep marine sediments in the Scotian Margin

Abstract

This study provides a quantitative environmental lipidomic baseline survey of subsurface microbial communities and deep marine surface sediments along the Scotian Margin. To achieve this, I am resolving the lipidome in terms of intact polar lipids (IPLs) and core lipids (CLs) extracted from gravity and piston core sediment samples taken from the upper 8 m of surface sediments spanning a ~500 km-long area of the Scotian Margin. These cores were collected during five cruises conducted from 2015 to 2021. The main objectives of my project are to 1) determine the lipid diversity of the natural microbial community within ocean floor sediments across the Scotian Margin and 2) to evaluate the geochemical environmental conditions of the subsurface sediments using chemotaxonomy. In doing this, I am examining the stratigraphic and geographic changes of the lipidome to track changes between upper water inputs, in situ production, and their resulting diagenetic alteration. Lastly, I will be evaluating lipidomic patterns across prospective hydrocarbon seep sites to differentiate the microbial community composition of ambient sediments from those that have been impacted by hydrocarbon seepages.

