

Postdoctoral researcher (m/f) - Polar Lipid Studies of Scotian Shelf Shallow Sediments

In 2015 the University of Calgary and the Nova Scotia Department of Energy, assisted by the Offshore Energy Research Association of Nova Scotia (OERA), submitted a successful proposal to Genomics Canada's Genomic Applications Partnership Program (GAPP) to develop and utilize bioassays of aerobic, anaerobic, and thermophilic hydrocarbon oxidizing bacteria as novel indirect hydrocarbon indicators for de-risking offshore petroleum exploration. This project has targeted the oil and gas prone Scotian Shelf of Nova Scotia as a test area. An investigation of polar lipid signatures from Scotian Shelf and Slope piston core sediments is now being introduced to yield better insights into the dynamics of the subsurface biosphere and carbon cycling as well as to help correlate genomic results with the composition and quality of extracted hydrocarbon shows.

A two-year (with potential for extension to a third year) Mitacs postdoctoral researcher is being sought to analyze the intact/non-intact polar lipids (IPLs and PLs) within these sediments. The postdoctoral researcher will utilize samples deemed interesting because they contain genomic evidence of bacterial anaerobic oxidation of hydrocarbons and/or have detected seep oil within the sediments. Samples collected of surface and piston core sediments off the Scotian Shelf and Slope during cruises in 2015 and 2016 have generated interesting results. Another cruise is planned for the summer of 2017 in the Sydney Basin for the collection of additional samples. The researcher will be based at Saint Mary's University in Halifax, Nova Scotia and will pursue work at the Bedford Institute of Oceanography (also in Halifax) as well as the Nova Scotia Department of Energy, and the Department of Bioengineering and Geomicrobiology at the University of Calgary.

Research tasks:

- Participate in upcoming cruise(s) to collect and log piston cores.
- Collect relevant sediment samples from the core library at Bedford Institute of Oceanography, the Canada Nova Scotia Offshore Petroleum Board core library, and the University of Calgary.
- Formalize wet chemistry procedures for the extraction and separation of bacterial and archaeal IPLs and PLs with authentic standards and matrix-matched reference materials.
- Identify and quantify the various IPLs and PLs within collected sediment samples.
- Relate these data to existing, geochemical, genomic assay and petroleum hydrocarbon data.
- Assess whether distributions of IPLs and PLs provides evidence for the presence of seep oils and biodegraded petroleum products.

Desirable qualifications:

- A PhD in a field area in which the identification and quantification of IPLs and PLs was an important component of research.
- Experience with the chemical extraction and separation of IPLs and PLs from sediments and total lipid extracts.
- Experience with using HPLC-MS in full scan and SIM modes.
- Experience with derivatization and the use of GC-MS or related GC techniques.

The research associate will be expected to produce work of publishable quality for appropriate peer reviewed journals, present papers at national and/or international meetings, and contribute to the development of collaborative research grants. The successful applicant will hold a PhD in a relevant subject at the time of employment. Applicants with experience in the outlined research are preferable.

Salary: 50,000 CAD per annum + benefits

Closing date: April 1st, 2017

Starting date: May, 2017

For informal enquiries and further information about this research project contact **Dr. Todd Ventura**, email: todd.ventura@smu.ca.

For further details about working in Saint Mary's University see: www.SMU.ca.