2019-03-06
Application ID: 55226

GLOBALINK RESEARCH INTERNSHIP AWARD
DISBURSEMENT INFORMATION AND PLACEMENT TERMS AND CONDITIONS

Dear Anju Tiwari,

Congratulations! You have been selected by Mitacs and Nihar Biswas from University of Windsor – Windsor to receive a **2019 Globalink Research Internship** award. You are therefore invited to participate in a research project at **University of Windsor – Windsor**. **Pursuant to an agreement with University of Windsor – Windsor, Mitacs will administer your funding grant.**

Mitacs Globalink Research Internship is a competitive program that pairs top-ranked international students with specific research expertise with faculty at Canadian universities for a twelve (12) week research project of mutual interest in the period of May to October. You have been selected by your Canadian host faculty project leader due to your background and skills in the research area and the unique contribution you will be making to the research during your stay. **The skills required for your role (as described in the research description below) were found to clearly match your skills set, education, and research experience.**

Research Internship Details

University/Institution:	University of Windsor – Windsor
Host Professor:	Nihar Biswas
Research Project Title:	Enzymatic Treatment of industrial wastewater (1)
NOC Code:	4012 Post-secondary teaching and research assistants

Research Description:

We have been working on developing enzyme-based methods for treatment of hazardous organic compounds which are present in industrial wastewater. Several classes of aromatic compounds constitute these hazardous wastes that require attention. Conventional biological treatment is often unable to remove these compounds from water. However, our proposed enzymatic treatment has been successfully employed to treat selected aromatics. Presently, this approach has been extended to so-called contaminants of emerging concern, derived from personal care products and pharmaceuticals, which are released from sewage treatment plants untreated. The enzyme-based method has the potential for providing a polishing step that could eliminate many of these compounds.

In this method, an isolated enzyme catalyzes the polymerization of the target compound(s) until they precipitate out of solution as non-toxic solids. For this project, the enzyme used will be soybean peroxidase and the target compounds will be nonyl- and octyl-phenols (NP and OP), which are breakdown products of widely-used non-ionic surfactants, and are known estrogen mimics. These compounds have shown to have serious effects on the endocrine system of fish, for example. Therefore, toxic effects on humans are also speculated.

The project will commence with batch reactor studies and micromolar concentrations of authentic NP and OP to optimize for the concentrations enzyme and hydrogen peroxide necessary to achieve > 95% removal of the target compound(s). Colorimetric and chromatographic methods will be used for analysis. A solid-phase extraction protocol will be developed to determine the limit of detection of the targets in wastewater using HPLC with UV detection. Real samples taken from the West Windsor
Sewage Treatment plant after the secondary treatment stage will be characterized for the target compounds and treated by the enzymatic method. Operating parameters for the latter will be re-scanned to check for matrix effects. A final report will be produced.

During your stay, you will be:

The student will design and conduct experiments based on standard solution-chemical manipulations. She will learn and apply methods based on UV-Vis colorimetry and HPLC to characterize the process being developed. She will keep good records of her experiments and report on them at the weekly lab group meetings and in a final written report.

She/he should be flexible in their work

If applicable, she will also be encouraged to write up the work for publication and/or poster presentation at an appropriate conference

Duration of Research:

12 weeks - to begin between May 1 and June 30, 2019 (unless otherwise approved by Mitacs) and end no later than October 31, 2019.

Hours of Work:

Minimum of forty (40) hours per week. Shortened durations must be agreed upon with the Supervisor and Mitacs. Durations of more than twelve (12) weeks will not be permitted.

Your award covers the full twelve (12) week of your internship unless you fall short of the full twelve (12) weeks, in which case the award will be prorated according to time actually spent in Canada contributing to the internship project.

For immigration purposes, as a Globalink Research Internship award recipient entering Canada for 120 consecutive days or less, you may be eligible for a work permit exemption under the Global Skills Strategy. Upon arrival at the Port of Entry, you should have supporting documents, such as:

- a copy of this award letter in its entirety
- your valid passport and any other document required to enter Canada (see https://www.canada.ca/en/immigration-refugees-citizenship/services/visit-canada/entry-requirements-country.html)
- proof that you meet requirements of the job, such as proof of work experience and education
- request a visitor record from Canadian border officials upon arrival at a Port of Entry

We look forward to welcoming you as a temporary member of the research team at University of Windsor – Windsor.

Acknowledgements :

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Mitacs Globalink is delivered by Mitacs on behalf of the following Academic partners:

Acadia University	Queen's University	Université INRS
Athabasca University	Royal Military College of Canada	Université Laval
Bishop's University	Royal Roads University	University of Alberta
Brandon University	Ryerson University	University of Calgary
Brock University	Saint Mary's University	University of Guelph
Cape Breton University	Saint Paul University	University of Lethbridge
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OCAD University	Université du Québec en Outaouais	York University

Sincerely,

Petra Kukacka
Director, International Programs

Enclosure::

- Appendix A: Terms and Conditions