

## Summer 2021 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region.

- Visit the [Sustainability Scholars Program website](#) to learn [how the program works](#) and to [apply](#).
- Be sure to review the [application guide](#) to confirm your eligibility before applying.

**Applications close at midnight on Sunday January 31, 2021.**

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### Research Project Title

Investigate sources and entry pathways for pharmaceuticals in the wastewater system.

### Project description

This research project is aimed at investigating the sources and entry pathways of pharmaceuticals in wastewater so that Metro Vancouver can better manage pharmaceuticals in our wastewater and protect receiving waterbodies.

In recent years, pharmaceuticals (e.g., prescription drugs and over-the-counter medications) have been detected at trace levels in surface waters across the world, and there is growing concern that these compounds pose adverse risks to aquatic life and human health. Many pharmaceuticals act as endocrine disrupting compounds, that alter hormone levels and reproductive function in organisms, or exhibit other toxicity mechanisms. Considered part of a group of compounds of environmental concern (CECs), the environmental and health impacts of pharmaceuticals are not completely understood especially when mixing and reacting with other substances. One of the main entry pathways for pharmaceuticals into waterbodies is through wastewater, since traditional wastewater treatment technologies may not completely remove the trace levels of pharmaceuticals present. However, less is known about the proportional contribution of entry pathways into wastewater such as excretion from humans, improper disposal down the drain, agricultural usage and runoff, etc.

Through desktop research and qualitative interviews, this project will include:

- 1) Literature review on pharmaceuticals in wastewater and management strategies
  - Research the prevalence of pharmaceuticals in waterbodies and wastewater and highlight the pharmaceutical classes/categories of concern (e.g., based on environmental risk, disposal behaviours, prescription or dosage practices, drug metabolism rates, etc.)
  - Building off previous Metro Vancouver work, research between 3 and 5 jurisdictions and summarize how they are managing pharmaceuticals in their wastewater, including a review of some successfully implemented regulations, standards, requirements of industries and residents, education initiatives, etc. Source Control Program staff will provide a suggested list of jurisdictions to review.
  - The scholar will have the opportunity to consult with the corporate librarian to access research tools and resources.

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- 2) Research and evaluate pathways of entry into the wastewater, including the rationale for why some pharmaceuticals might be found more commonly in wastewater than others
  - Research and determine general trends for different sources of pharmaceuticals in wastewater in a few (3 to 5) jurisdictions across North America: percent contribution from 1) excretion, 2) disposal, 3) agricultural runoff and 4) commercial/industrial discharge.
  - Create a research database with information on what medications are flushed or disposed of down the drain in various jurisdictions. If region specific information is unavailable, use findings to infer what it may mean for the region.
  - Source Control Program staff will provide sampling results to inform what common medications are currently found in the wastewater as well as some available studies to inform this task.
- 3) Conduct qualitative interviews and identify opportunities to reduce pharmaceuticals discharged into wastewater (e.g., reducing prescription doses, modifying metabolism efficiency, communication by health professionals)
  - Gather feedback from 2-3 local pharmacies on their awareness and participation in existing drug take-back programs. For example, method of tracking amount of medications returned, methods of program promotion, challenges and areas of improvement, etc. Source Control Program staff will provide suggestions on potential pharmacies for Scholar to connect with.
  - Gather feedback from 2-3 local health practitioners on how to reduce pharmaceuticals entering wastewater while protecting patient health. For example, would reducing prescribed doses be restricted by existing prescribing rules? If the prescription amount is at the discretion of the health professionals, what are some opportunities to change the amount prescribed?
  - Source control program staff will assist the scholar with coordinating interviewees, interview planning and question preparation.
- 4) Based on research findings, recommend source control initiatives and next steps in addressing areas that require further investigation.
  - Based on the available data and on the interview findings, create a list of hot spots or catchments where local pharmacies report the greatest/lowest number of pharmaceuticals returned through drug take back programs. If possible, determine potential correlations with the demographics of that catchment.
  - Document in a written report summarizing research findings with recommended source control initiatives and/or areas requiring further research.

Upon completion, the findings from the project will be used in the development of a Source Control strategy for pharmaceuticals, as well as help inform the development of targeted educational and outreach initiatives for 2021, and development of potential metrics by using the statistics determined from this project as a baseline for comparison. Recommendations will also be shared with existing CEC working group members within the Liquid Waste Department (including stakeholders from the Environmental Management and Quality Control division, Utilities Resource Management division, Collaborative Innovations group and Wastewater Treatment Plant division), who will use the final report and recommendations to inform the collaborative effort to develop a GVS&DD management strategy for CECs.

## **Deliverables**

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1. Written report of findings from the four main project tasks
2. Final presentation(s) to key stakeholders (e.g., CEC working group, Source Control Program)
3. Final report or executive summary for the Sustainability Scholars Online Project Library

## Time Commitment

- This project will take **400\*** hours to complete.
- This project must be completed between **May 3 and August 13. (Flexible and can be mutually agreed upon with scholar, i.e., advance start date and reduce hours per week)**
- The scholar is to complete hours between **8 AM – 4:30 PM, Monday to Friday**, approximately **28** hours per week.
- The scholar is encouraged to present the project and findings at
  - One to two CEC working group meeting (dates TBD)
  - One to two check-in meetings with Source Control Program (dates TBD)

## Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Experience conducting stakeholder engagement events, including facilitation skills, is an asset
- Familiarity with research methodologies and survey techniques
- Statistical analysis
- Familiarity conducting focus group research
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Project management and organizational skills
- Demonstrated experience in pharmaceutical/medical science or industry would be an asset
- Comfortable interacting with strangers to conduct public/in person surveys

Applications close **midnight Sunday January 31, 2021**

Apply here: [Click here to apply](#)

Contact Karen Taylor at [sustainability.scholars@ubc.ca](mailto:sustainability.scholars@ubc.ca) if you have questions

## Useful Resources

# SUSTAINABILITY SCHOLARS PROGRAM

We are holding a special **resume preparation workshop for prospective Scholars** on January 19. [Click here for details and to register.](#)

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

<https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae>

<https://www.grad.ubc.ca/current-students/graduate-pathways-success>

<https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services>