RYLAND T. GIEBELHAUS

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EDUCATION

PhD University of Alberta — September 2021 to Present
Doctor of Philosophy, Chemistry
Supervisor: Dr. James Harynuk
Grade Point Average: 4.0

BSc (Hons.) University of British Columbia — September 2016 to May 2021
Bachelor of Science, Honors in Chemistry
Supervisors: Dr. Susan J. Murch; Dr. Thuy T. Dang
Thesis Title: Metabolomics and Hormonomics of *Mitragyna speciosa*
Graduating Average: 92.6%

RESEARCH EXPERIENCE

University of Alberta, Edmonton — September 2021 to Present
PhD (Chemistry)
Advisor: Dr. James J. Harynuk

- Development of a novel region of interest (ROI) selection tool for 1-dimensional and 2-dimensional gas chromatography mass spectrometry data using the MATLAB computational language.
- Validation of wristband based passive samplers for use by expecting and post-partum mothers to monitor their exposure to volatiles in their environment using GC-FID.
- Prototyping and testing of sampling methods and analytical techniques for the post-partum metabolomics screening by GC×GC-TOFMS.
- Metabolomics of human samples (urine, breast milk, plasma) by GC×GC-TOFMS.

University of British Columbia, Kelowna — September 2020 to May 2021
BSc Honors Thesis
Thesis Title: Metabolomics and Hormonomics of *Mitragyna speciosa*
Advisors: Dr. Susan J. Murch and Dr. Thuy T. Dang

- Development and validation of targeted and untargeted UPLC – MS/MS metabolomics method for plant metabolites.
- Determination of intermediates in the mitragynine pathway in *M. speciosa*.
- Application and implementation of the Design of Experiments (DoE) methodology.
- Continued work on a metabolomics tool developed during summer 2020 research project.

University of British Columbia, Kelowna January 2018 to August 2021
Research Assistant, PlantSMART lab

- Responsible for laboratory, including maintenance of instruments and plant cultures during COVID-19 (March 2020 to April 2021).
- Performed plant tissue culture and prepare growth medium.
- Developed and validate analytical methods on a UPLC – MS/MS.
- Designed and developed a searchable database and metabolomics tool that searches untargeted MS datasets for phytohormones using R, python, and HTML coding languages.
- Learned how to maintain, troubleshoot, and repair a UPLC – MS/MS instrument:
    - Replaced seals on the LC pumps.
    - Full cleaning of the LC system.
    - Replacement of parts in the sample manager.
    - Cleaning source and ion optics on the MS.

HONORS AND AWARDS

Chemistry Recruitment Scholarship (PhD) – 5000 CAD September 2022

Richard D. Sacks Award | 1st Place Poster – 500 USD May 2022

Canada Graduate Scholarship-Master's (CGS-M) – 17500 CAD September 2021

Walter H Johns Graduate Fellowship – 5800 CAD September 2021

Chemistry Recruitment Scholarship (MSc) – 5000 CAD September 2021

Faculty of Science Graduate Scholarship – 2000 CAD September 2021

First Place | Canadian Chemistry Conference and Exhibition – 75 CAD August 2021

Second Place | UBCO Undergraduate Research Conference April 2021

Undergraduate Student Research Award (USRA) – 6000 CAD March 2021

ACPBC Undergraduate Student Scholarship – 1000 CAD June 2020

Undergraduate Student Research Award (URA) – 9500 CAD March 2020

Aboriginal Undergraduate Research Mentorship Award – 3300 CAD January 2020

Dean's List May 2019

Undergraduate Student Research Award – 9500 CAD (Declined) March 2020

Undergraduate Student Research Award (USRA) – 4500 CAD March 2019

Aboriginal Undergraduate Research Mentorship Award – 3300 CAD January 2019

Aboriginal Undergraduate Research Mentorship Award – 3000 CAD January 2018

DVC Scholarship for Continuing Students – 500 CAD September 2017

Kelowna Medical Imaging Bursary – 1000 CAD June 2016

Graduation Program Examination Scholarship – 1200 CAD June 2016

SD #23 District Award Scholarship – 1000 CAD June 2016

Interior Savings Bursary – 1000 CAD June 2016

TEACHING EXPERIENCE

University of British Columbia, Kelowna August 2022
Guest Lecturer, Metabolomics Short Course/Micro-credential

- Invited to deliver a 2-hour guest lecture to UBC Okanagan's Metabolomics Short Course/Micro-credential delivered by Dr. Susan Murch.
- Discussed my research at UBC Okanagan and ongoing research program at the University of Alberta.
- Spoke on my personal interests in metabolomics and important skills needed for metabolomics.

University of Alberta, Edmonton September 2021 to December 2021
Graduate Teaching Assistant, Chemistry

- Taught two lab sections biweekly of CHEM 10X: Introductory University Chemistry.
- Guided students through performing experiments pertaining to the lab.
- Marked lab reports and returned them in a timely fashion.

University of British Columbia, Kelowna September 2020 to December 2020
Teaching Assistant, Chemistry

- Taught two lab sections per week for CHEM 211: Introduction to Analytical Chemistry with an average of 20 students per lab.
- Reviewed topics covered in lecture such as standard curves, chromatography, and instructed in procedure in the multiple experiments performed per week.
- Marked lab reports and returned them in a timely fashion.

University of British Columbia, Kelowna September 2019 to December 2019
Teaching Assistant, Chemistry

- Taught one lab section for CHEM 1X1: Principles of Chemistry I with 20 students.
- Reviewed topics covered in lecture and instructed in procedure in the experiments.
- Lab reports were marked and returned in a timely fashion as well as exams.

University of British Columbia, Kelowna September 2018 to December 2018
Teaching Assistant, Chemistry

- Taught all students in CHEM 220: Atomic Structure and Molecular Bonding with 42 students.
- Reviewed topics covered in lecture such as orbitals, orbital hybridization, molecular bonding, and molecular orbital theory.
- Marked lab reports and returned them in a timely fashion.

University of British Columbia, Kelowna September 2017 to April 2021
Tutor, Chemistry Course Union

- Assisted undergraduate students in chemistry courses in learning concepts to succeed in exams and cultivate an interest in the field through holding office hours and hosting study sessions for exams.

SERVICE TO THE COMMUNITY AND OUTREACH

Analytical Chemistry Visiting Speaker Series
Chair, Student Organizing Committee (July 2022 to Present)

- Working with a team of faculty members in the analytical division at the University of Alberta to organize guest lecturers.
- Communicate with analytical graduate students and guide in the selection process of visiting speakers.

NIEHS Exposome Workshop
Participant (July 2022 to September 2022)

- Participating in all 5 virtual workshops hosted by the National Institute of Environmental Health Sciences (NIEHS).
- Attended break out rooms and engaged in discussions about exposomics and metabolomics relating to human health.

Research Panel for CHEM 299 class
Panelist (November 2021)

- Presented as a panelist for of the CHEM 299 (Research Opportunity Program in Chemistry) class at the University of Alberta to talk to students about my research path from undergrad to graduate school.

Metabolomics Association of North America (MANA) Journal Club
Attendee and Presenter (April 2021 to May 2021)

- The MANA runs a weekly journal club for its student members to present recently published metabolomics papers to other students and faculty members. I attended each of the weekly journal clubs and also presented a paper to the audience during one of the meetings.

UBCO Chemistry Course Union (CCU)
The CCU is the largest course union on the UBC Okanagan campus with over 400 members who pay an annual fee to join. Each year, the CCU hosts social, mentoring, and academic events such as: Pub Nights, Midterm Study Sessions, career panels, one-to-one tutoring and so on.

Treasurer (April 2018 to April 2019; April 2020 to April 2021)

- Responsible for the management of student dues, expenses, reconciling accounts and reporting to the membership.

President (April 2019 to April 2020)

- As the leader of the CCU executive, I was responsible for making decisions organization of events. I created a career panel event that brings professional chemists to talk with graduating students. I was the CCU liaison with faculty members regarding projects and events. I led the team that hosted the WCUCC meeting in Kelowna.
- During my tenure as president the CCU received national recognition from the Chemical Institute of Canada placing first in both the "2020 Student Chapter Merit Award" and the "2021 Student Chapter Merit Award" competitions.

Tutor (September 2017 to April 2021)

- Provided resources and support to undergraduate students in chemistry courses to help them to understand the concepts required to succeed in courses and to cultivate an interest in the field.

2019 Western Canadian Undergraduate Chemistry Conference
The WCUCC is an annual research conference planned by undergraduates for undergraduate researchers from across western Canada to present their research work. In a normal year, the host institution has about a year to organize the conference but in 2019, exceptional circumstances at another campus created an extraordinary circumstance. We organized the 2019 WCUCC conference with 48 abstracts with 55 student attendees from BC, Alberta, and Manitoba in less than 3 months.

Host & Chair, Local Organizing Committee, (April 2019 to June 2019)

- Responsible for overseeing all aspects of the conference.
- Spearheaded planning the conference in 3 months rather than the typical year allotted to the host.
- Raised more than $12,000 in funding and in-kind sponsorship in less than 3 months.
- Coordinated a team of 8 student volunteers, 2 faculty members, and graduate student judges.
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MENTORING AND SUPERVISORY EXPERIENCE

The Harynuk Lab, UofA, Edmonton September 2021 to Present
Supervising two undergraduate students on various metabolomics projects. Including the development of new GC×GC-TOFMS metabolomics protocols to explore the metabolites in breastmilk, urine, and breath.

PlantSMART Lab, UBC, Kelowna January 2018 to August 2021
Taught one graduate student and three undergraduate students how to prepare growth medium and techniques for aseptic plant tissue culture. Taught one undergraduate student, one graduate student, and one post-doctoral fellow how to maintain and use the UPLC-MS/MS system in the laboratory to perform screening and quantification.

The Chemistry Course Union, UBC, Kelowna April 2018 to April 2021

Mentored other executive members and "sub-executives" to teach them about the role of treasurer and president to prepare the organization for a smooth succession between academic years. Also mentored tutors to help with improving their tutoring skills. Have written reference letters for applications and served as a verifier for members medical school applications.

Big White Ski Club, Kelowna November 2014 to April 2021

Coached with the Big White Ski Club for 7 consecutive seasons, mainly focusing on coaching the U12 program. Coached approximately 20 athletes, aged 10 – 11 each season with two to four other coaches. Ensured the safety of athletes while developing skiing skills and encouraging the adoption of a healthy lifestyle through regular exercise and proper nutrition. Additionally mentored five junior coaches on how to be an effective and professional coach to provide the most enjoyable and fulfilling environment to the athletes. A number of athletes continued onto coaching themselves, playing collegiate sports, or racing at the national level. One previous athlete of mine was named to the BC Ski Team in Spring 2022.

Gallaghers Canyon Golf Club, Kelowna March 2015 to September 2018

Worked in guest services at Gallaghers Canyon Golf and Country Club in Kelowna for four seasons. Gallaghers is one of the top golf destinations in Canada, consistently ranked in the top 100, and also hosts an annual stop on the Canadian PGA tour. I was employed as the guest services manager during my last season (March to September 2018) where I was responsible for a team of 12 employees. My duties included the maintenance of a fleet of 75 golf carts, producing monthly budgets for salaries and expenditures, and ensuring my team conducted themselves in a respectful and professional manner to best represent the facility.

PUBLICATIONS

REFEREED PUBLICATIONS

Lauren A.E. Erland, **Ryland T. Giebelhaus**, Jerrin M.R. Victor, Susan J. Murch, and Praveen K. Saxena. The Morphoregulatory Role of Thidiazuron: Metabolomics-Guided Hypothesis Generation for Mechanisms of Activity, *Biomolecules,* **2020**, *10*(9), 1253.

Ryland T. Giebelhaus, Lauren A.E. Erland, and Susan J. Murch. (2022). HormonomicsDB: A New Tool for the Analysis of Plant Growth Regulators in Untargeted Metabolomics. (In Press)

PREPRINTS

Ryland T. Giebelhaus, Michael D. Sorochan Armstrong, A. Paulina de la Mata, and James J. Harynuk. Untargeted Region of Interest Selection for GC-MS Data using a Pseudo F-Ratio Moving Window (ψFRMV), *ArXiv,* **2022,** doi:10.48550/ARXIV.2208.00313

CONFERENCE PRESENTATIONS AND ABSTRACTS
Note: Presenter identified with *

Sebastian Dosoftei*, **Ryland T. Giebelhaus**, A. Paulina de la Mata, and James J. Harynuk, 2022, "Urine 3 Ways: Comparing Urine Metabolomics Sampling using Derivatization, Dynamic Headspace, and Solid-Phase Microextraction" (Poster), *Undergraduate Research Symposium,* Edmonton, Canada, August 26th.

A. Paulina de la Mata*, Kieran Tarazona Carrillo, **Ryland T. Giebelhaus**, and James J. Harynuk, 2022, "Metabolome of Meconium by GC×GC-TOFMS" (Poster), *18th International Conference of the Metabolomics Society,* Valencia, Spain, June 19th – 23rd.

Ryland T. Giebelhaus*, Michael D.S. Armstrong, A. Paulina de la Mata, and James J. Harynuk, 2022, "Region of Interest Selection for GC-MS and GC×GC-TOFMS Data with a Pseudo Fisher Ratio Moving Window", *105th Canadian Chemistry Conference and Exhibition,* Calgary, Alberta, June 13th – 17th.

Ryland T. Giebelhaus, Lauren A.E. Erland, and Susan J. Murch*, 2022, "Hydrophilic interaction chromatography for quantification: Current challenges and future directions", *105th Canadian Chemistry Conference and Exhibition,* Calgary, Alberta, June 13th – 17th.

A. Paulina de la Mata*****, Kieran Tarazona Carrillo, Ryan P. Dias, and **Ryland T. Giebelhaus**, 2022, "Biofluids, Biosolids and Food Analysis with Different Types of Sample Introduction For GC×GC-TOFMS: How GERSTEL Changed Our Lab Life", *19th International GCxGC Symposium,* Online, May 29th to June 2nd.

Ryland T. Giebelhaus*, Michael D.S. Armstrong, A. Paulina de la Mata, and James J. Harynuk, 2022, "Region of Interest Selection for GC×GC-TOFMS Data using a Pseudo Fisher Ratio Moving Window with Watershed Segmentation" (Poster), *19th International GCxGC Symposium,* Online, May 29th – June 2nd. **1st Place Poster | Richard D. Sacks Award.**

Ryland T. Giebelhaus*, A. Paulina de la Mata, Ryan P. Dias, Matt S. Hicks, and James J. Harynuk, 2022, "The development of new analytical tools to better understand the impact of fetal and infant cannabis exposure" (Poster), 2022, *University of Alberta Faculty of Medicine 2022 Pediatric Research Day*, Edmonton, Alberta, April 20th.

Ryland T. Giebelhaus*, Michael D.S. Armstrong, A. Paulina de la Mata, and James J. Harynuk, 2022, "Region of Interest Selection for GC-MS Data with a Pseudo Fisher Ratio Moving Window", *13th Winter Symposium on Chemometrics,* Online, February 28th – March 4th.

James J. Harynuk*, Michael D.S. Armstrong, and **Ryland T. Giebelhaus**, 2022, "Towards fully automated processing of GC×GC-TOFMS data", *13th Multi-dimensional chromatography workshop,* Online, January 31st – February 2nd.

Ryland T. Giebelhaus*, Lauren A.E. Erland, and Susan J. Murch, 2021, "A Snapshot in Time: Metabolomic comparison of the living fossil *Wollemia nobilis* and *Araucaria heterophylla*" (Poster), *The 3rd Annual Metabolomics Association of North America Conference,* Online, October 18 – 21st.

Ryland T. Giebelhaus*, Lauren A.E. Erland, and Susan J. Murch, 2021, "HormonomicsDB: A new tool for analysis of plant growth regulators" (Poster), *IUPAC | CCCE 2021,* Online, August 17th. **1st Place Undergraduate Poster in Analytical Division.**

Ryland T. Giebelhaus*, Lauren A.E. Erland, Thu-Thuy T. Dang, and Susan J. Murch, 2021, "Are all kratom products created equal? Metabolomics of *Mitragyna speciosa* and commercial kratom products" (Poster), *60th Anniversary Meeting Phytochemical Society of North America*, Online, July 25th – 30th.

Ryland T. Giebelhaus*, Lauren A.E. Erland, and Susan J. Murch, 2021, "A Snapshot in Time: Metabolomic comparison of the living fossil *Wollemia nobilis* and *Araucaria heterophylla*" (Poster), *The 17th Annual Conference of the Metabolomics Society*, Online, June 22 – 24th.

Lauren A.E. Erland*, **Ryland T. Giebelhaus**, and Susan J. Murch, 2021, "Cranberry as a source of novel phytomelatonin natural health products", *Natural Health Products Research Society Virtual Conference,* Online, June 7 – 9th & 14 – 16th.

Ryland T. Giebelhaus*, Thu-Thuy T. Dang, and Susan J. Murch, 2021, "Are all kratom products created equal? Metabolomics of *Mitragyna speciosa* and commercial kratom products" (Poster), *UBC Okanagan Undergraduate Research Conference*, Online, April 14th. **2nd Place Poster at Conference.**

Ryland T. Giebelhaus*, Lauren A.E. Erland, and Susan J. Murch, 2020, "HormonomicsDB: A new tool for analysis of plant growth regulators" (Poster), *The 16th Annual Conference of the Metabolomics Society,* Online, October 27 – 29th.

Ryland T. Giebelhaus*, and Susan J. Murch, 2020, "HormonomicsDB: A new tool for analysis of plant growth regulators", *UBC Okanagan 2020 Undergraduate Research Awards Symposium,* Online, September 17.

Ryland T. Giebelhaus*, and Susan J. Murch, 2020, "HormonomicsDB: A new tool for analysis of plant growth regulators", *The 2nd Annual Metabolomics Association of North America Conference,* Online, September 14 – 16.

Lauren A.E. Erland*, **Ryland T. Giebelhaus**, Jerrin M.R. Victor, Susan J. Murch, and Praveen K. Saxena, 2020, "The Morphoregulatory Role of Thidiazuron: Metabolomics-Guided Hypothesis Generation for Mechanisms of Activity" (Poster), *The 2nd Annual Metabolomics Association of North America Conference,* Online, September 14 – 16.

Ryland T. Giebelhaus*, and Susan J. Murch, 2019, "Validation and Application of an Underivatized Method to Detect Glyphosate and its metabolite AMPA in Food Samples", *UBC Okanagan 2019 Undergraduate Research Awards Symposium,* Kelowna, BC, September 17 – 18.

PROFESSIONAL AFFILIATIONS

Metabolomics Association of North America 2020 to Present
Student Member

Metabolomics Society 2020 to Present
Student Member

Chemical Institute of Canada 2019 to Present
Student Member

REFEREES

Professor James J. Harynuk
Professor of Chemistry, University of Alberta, Edmonton
james.harynuk@ualberta.ca

Professor Susan J. Murch
Professor of Chemistry, The University of British Columbia, Kelowna
susan.murch@ubc.ca

Professor Thuy T. Dang
Assistant Professor of Chemistry, The University of British Columbia, Kelowna
thuy.dang@ubc.ca