

Department of Chemistry Newsletter



Issue 4 (April), 2022

Irving K. Barber Faculty of Science, University of British Columbia
Syilx Okanagan Nation Territory

Announcements

Congratulations to:



Riley Petillion, who successfully defended his Ph.D. thesis in April. He is the first person in Canada to receive a Ph.D. degree in Chemistry Education! Dr. Petillion was a graduate student in Dr. Steve McNeil's chemical education research group.



Prof. Gino DiLabio for the \$104,000 eCampus Ontario grant "Equipping and empowering graduate students in STEM with professional and lifelong learning skills" to our pan-Canadian group.

Everyone who participated at the Undergraduate Research Conference and Honours Thesis Defences

We would like to thank graduate students and postdoctoral research fellows who contributed to a robust discussion atmosphere and helped judge the posters in the 2022 I.K. Barber Faculty of Science Chemistry Undergraduate Research Conference on April 12. Your participation was indispensable! Thank you for your time and effort Adeyemi Adebawale, Minh (Scott) An, Hung Bui, Amanda Darbyshire, Lauren Erland, Thomas Head, Jackline Irungu, Matthew McConnachie, Alex McGregor, Emma Mitchell, Anh Nguyen, Nitin, Helena Nunes, Peter Osei Ohemeng, Riley Petillion, Julia Solonenka, and Emilian Tuca! Special thanks to Dr. Nguyen for organizing the poster judging and the team of judges, and to Dr. Isaac Li for coordinating the entire event.

The best poster prizes were awarded to

- 1st : **Heather Ng-Cornish** (Zandberg lab): Smoke taint volatile phenol concentrations and glycosidic counterparts in *Vitus vinifera* berries and wine
- 2nd : **Shilong Pan** (Li lab): Identification and sizing of extracellular vesicles from blood plasma using lipid and protein markers
- 3rd : **Jessica Ollinik** (Zandberg lab): Deducing seasonal changes in bovine milk oligosaccharides
- 4th : **Simona Mastroianni** (Murch and Shipley labs): The antimicrobial properties of breadfruit leaves for cosmetic applications

Other notable mentions:

- **Amos Chua** (Wolthers): Identification of a compatible redox partner for a heme-bound flavodoxin from *Fusobacterium nucleatum*
- **Arantxa Da Fonseca** (Menard): Evaluating changes in membrane potential and calcium influx in L-type calcium channels caused by a barbiturate-based chemical probe
- **Olivia Dixon** (Menard): Towards a total synthesis of rotundial
- **Alexander Fennell** (Menard): Development of unilamellar vesicles and bioinformatic analysis of MFG-E8, a glycoprotein implicated in neurodegenerative disease
- **Julia Hansen** (Zandberg): Preparation of highly purified N-glycans for the evaluation of metabolism of dairy glycoproteins by gastrointestinal microbes *in vitro*
- **Emily Knudson-Goerner** (Zandberg): Establishing a workflow for linkage analysis of oligosaccharides and polysaccharides
- **Brooke Kwan** (Dang): Diversification of the anticancer tabersonine scaffold using cytochrome P450 monooxygenases
- **Allison Leam** (Li): Visualizing the tensile forces of cell adhesion using DNA-based molecular force probes
- **Emmanuella Oduro** (Wolthers): Kinetic and functional analysis of the restored arginase component of ornithine decarboxylase/arginase from *Fusobacterium nucleatum*
- **Dyuti Raghu** (Li): Development of protocols for calibration of dual-trap optical tweezers
- **Darina Vekhova** (Menard): Investigation of NOX2 inhibition mechanism via protein labelling
- **Kadie Wert** (Godin and Peleato): Carbon nitride as a potential water treatment for natural organic material
- **Micah Yang** (Li): Characterization of tension gauge tether rupture forces
- **Guilherme Zandamela** (Zandberg): Towards next generation glycan sequencing: A combined capillary electrophoretic and electroosmotic method for oligomeric and monomeric characterization of complex polysaccharides
- **Ziyi Zhang** (Godin): Post synthetic chemical structure modification of carbon nitride through amide linkages

Congratulations to **Dr. Jennifer Robison** on her retirement! The students, staff, and faculty at the Chemistry Department are thankful for her half a decade exemplary dedicated service and commitment to keeping the chemistry teaching labs running smoothly, especially during the last few years of the COVID pandemic. She will be missed by all of us! We are grateful that as she is easing into retirement, we will be able to benefit from her remote support with the day-to-day operations and mentoring of our new lab manager, Ieva Zigg.



Since Dr. Robison did not want as to make a big deal out of her retirement, the Department celebrated her on two occasions masked as TA appreciation pizza party and End of Semester gathering. The latter gave the opportunity to give her a “sweet send-off” with the theme of “After climbing the mountain, you finally can enjoy the view!” as illustrated by the cupcake toppings of fishing, hiking, and gardening.

A shout-out to Michele Canon for coordinating a thoughtful present for her to remember us while she is gardening.

Despite the chilly spring afternoon, faculty and staff dropped by to catch up after the challenging semester. If you did not have a chance to attend, stand by for more social events to come.



Facilities/Instruments News

Dr. Robert Godin (Principal Investigator), Dr. Isaac Li (co-I), and Dr. Fred Menard (co-I) were successful to secure NSERC RTI application for an advanced Photo Luminescence (PL) spectrometer! This tool is planned to be a workhorse for the Department's needs in PL spectroscopy. The configuration is still being finalized, so if someone has a specific use in mind, they should get in touch with Dr. Godin.

Welcome

Bhavesh Gnnanapareddy and Niamh Carbin Mitacs Globalink undergraduate researchers will be joining the **DiLabio Lab** this summer.

Godin Lab is welcoming new students in the SolarSpec lab:

- Cody Crozier: A UBCO alum who is volunteering in the lab to look at the dye photodegradation activity of different carbon nitride materials.
- Mira Cuthill: A work-study student who will be developing MATLAB-based code for data analysis.
- Stephanie Busse: A work-study student who will work on the surface modification and functionalization of carbon nitrides to obtain robust films.
- Nicole Alejandra Solano Banuelos: A Mitacs Globalink international student who will look into the optimization of conditions to prepare high activity dispersible carbon nitride from a mix of two different precursors.



Nishtha Singh joins the **Li lab** for M.Sc. degree.

The **Menard lab** welcomes



Victor Hellgren, Master of Chemistry, Uppsala Universitet, Sweden
"Synthesis of imaging probes to study voltage-gated calcium channels in living cells"
International Research Internship / February—June 2022



Camille Rogers
Master of Chemistry, Ecole Nationale Supérieure de Genie Chimique, Toulouse, France
"Total synthesis of rotundial and analogs as an insect repellent strategy to counter malaria." International Research Internship / May—August 2022

Recent publications/presentations



Y. Kovalenko, **J. VanderWeide**, R. Tindjau, **W.F. Zandberg**, and S.D. Castellarin:
Timing and severity of crop load management influences technological maturity, terpene
synthase expression and free terpene accumulation in Gewürztraminer grapes (*Vitis
vinifera*). *Australian Journal of Grape and Wine Research*, 2022, ASAP.

J. Wang, **J. VanderWeide**, Y. Yan, T. Ricco, L. Deluc, **W.F. Zandberg**, and S.D.
Castellarin: Jasmonates regulate terpene biosynthesis in Gewürztraminer grapes (*Vitis
vinifera* L.) with no crosstalk from other ripening-related hormones. (2022) *Food
Chemistry* DOI: 10.1016/j.foodchem.2022.132948



Viki Kumar Prasad, Alberto Otero-de-la-Roza, and **Gino A. DiLabio**:
Small-basis set density-functional theory methods corrected with atom-
centered potentials, *J. Chem. Theory Comput.* 2022, As Soon As Publishable
article, DOI: 10.1021/acs.jctc.2c00036.



Helena H. Chubatsu Nunes, **Trinh-Don Nguyen**, **Thu-Thuy
T. Dang**: Chemoenzymatic strategies using biocatalysts from plants
for the synthesis of valuable natural products. *Current Opinion in
Green and Sustainable Chemistry*. 2022,
DOI: 10.1016/j.cogsc.2022.100627



B. Talebjedi, M. Heydari, E. Taatizadeh, N. Tasnim, **I.T.S. Li***, M. Hoorfar*:
Neural network-based optimization of an acousto microfluidic system for
submicron bioparticle separation, *Frontiers in Bioengineering* 2022, 10, 878398

News/Events

2022 Celebrate Learning Week (CLW) Promoting Inclusivity and Accessibility.

Dr. Freeman and Dr. McNeil are hosting an informal discussion about questions of inclusivity and accessibility in chemical sciences learning, to talk about how our choices of course design and delivery elements might reduce (or exacerbate) barriers to some students. The discussion is scheduled for the morning of Fri May 13, but events are happening all week long, so follow the links below to register for our session and to see a complete schedule:

<https://events.cltl.ubc.ca/events/inclusive-and-accessible-teaching-in-the-physical-sciences-challenges-and-opportunities/>

<https://celebratelearning.ubc.ca/events/2022-events/>

We would like to express our gratitude for the land on which we gather, work, and live, which is the unceded territory of the Syilx (Okanagan) Peoples.

If you would like to contribute to, or have any suggestions for, our Department's upcoming newsletters, please contact Thuy Dang (thuy.dang@ubc.ca) editor-in-chief or her 'assistant editor' Robert Szilagyi (robert.szilagyi@ubc.ca).