

THE GOLD STANDARD

Annual Newsletter

Analytical Chemistry Division, The Chemical Institute
of Canada

Spring 2015

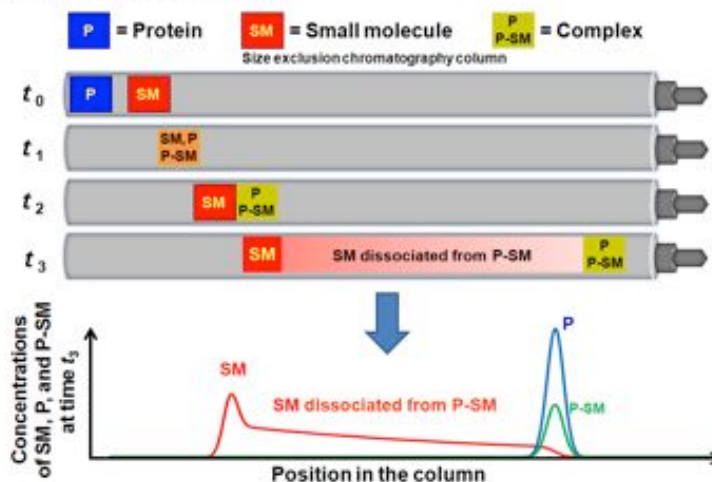
In This Issue:

Upcoming Conferences, Student Award, Winners, Former Student Profile,
Faculty Profile, Funding Opportunities, ... and More

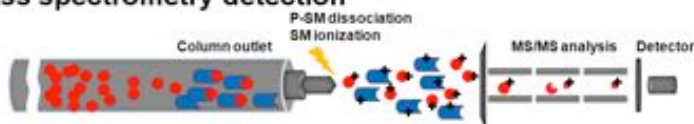
Cover art by Jiayin Bao, York University

Kinetic Size-Exclusion Chromatography with Mass Spectrometry Detection (KSEC-MS)

Mixing and separation



Mass spectrometry detection



Data processing



The Chemical Institute of Canada's (CIC) Career Services.

- The CIC is the association for all chemical professionals in Canada.
- The CIC provides a unique online job networking resource CareerSite for all chemical professionals and students

<http://www.cheminst.ca/career/>

Increase your career opportunities by taking advantage of the CIC Career Services. Access Canada's sole chemical related job site. Opportunities abound! Receive multiple benefits with membership to The Chemical Institute of Canada.



OTHER BENEFITS OF MEMBERSHIP IN THE ACD (CSC)

In addition to the activities of the particular Student Chapter, membership will confer the following benefits for students:

- Receipt of Canadian Chemical News/ L'Actualité Chimique Canadienne for members in 2nd and higher years (by bulk mail);
- Eligibility to apply for group insurance on car and home insurance through Monnex Inc.;
- Use of the CIC Employment Service for students in the final year of their program who are seeking permanent employment after graduation;
- Substantially reduced registration fees for the annual CSC Conference;
- Full membership in the CSC in the first year after graduation for one-half of the full membership fee.

Eligibility for a range of scholarships and awards, a comprehensive list of which is given in this newsletter.

ANALYTICAL CHEMISTRY WEBSITES

The Chemical Institute of Canada:

<http://ANchem.ca/>
<http://www.cheminst.ca/>

American Chemical Society
Division of Analytical Chemistry:

<http://www.analyticalsciences.org/>

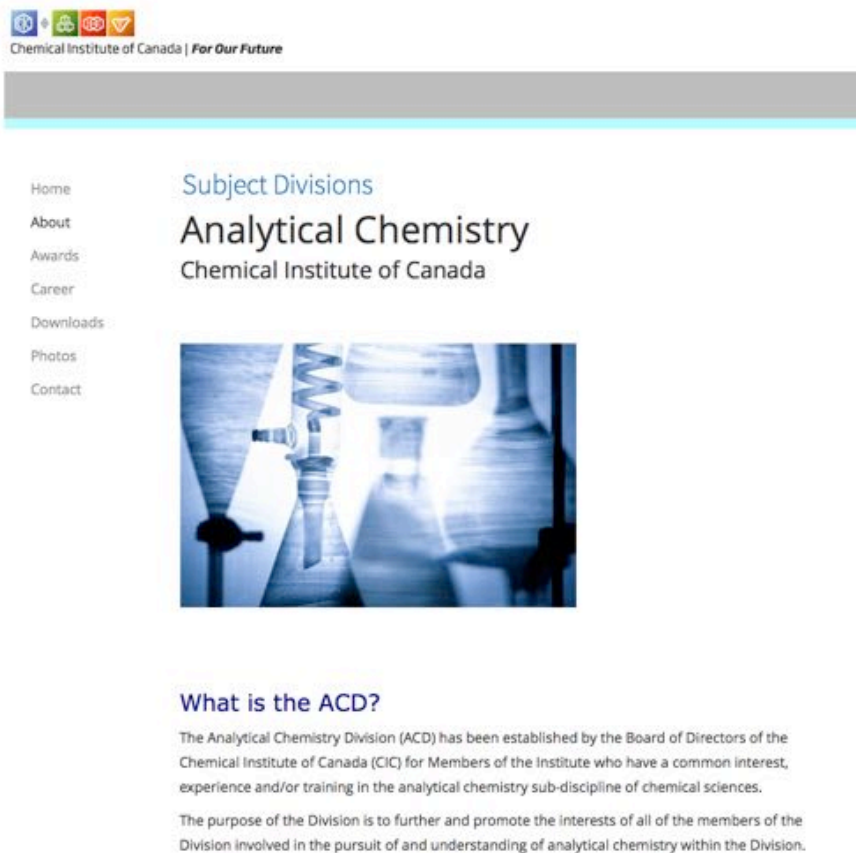
Conference of Small Molecule Science (CoSMoS):

<http://www.cosmoscience.org/>



Three ways to stay informed!

1. Keep in touch with your division. Visit our ACD website ANchem.ca



The screenshot shows the website for the Analytical Chemistry Division of the Chemical Institute of Canada. At the top, there are social media icons for Facebook, Twitter, LinkedIn, and YouTube, followed by the text "Chemical Institute of Canada | For Our Future". A navigation menu on the left lists: Home, About, Awards, Career, Downloads, Photos, and Contact. The main content area features the heading "Subject Divisions" and "Analytical Chemistry Chemical Institute of Canada". Below this is a photograph of laboratory glassware, including a flask with a magnetic stirrer and several beakers. Underneath the photo is the section "What is the ACD?" with two paragraphs of text explaining the division's purpose and membership.

2. Follow ACD on Twitter [@analytical_chem](https://twitter.com/analytical_chem)



3. Subscribe to ACD eMail list <http://anchemca.wordpress.com> (hit "Follow" at bottom right corner)

Upcoming Conferences

ICASS 2015

The 60th edition will be held in Halifax at the St. Mary's University from May 19-22nd, 2015. Please visit the website or contact the conference organizer: marc.lamoureux@smu.ca.

<http://www.csass.org/docs/ICASS2015.pdf>

CSC 2015 – Ottawa

The 98th annual Conference of the Canadian Society for Chemistry will be held this year in Ottawa. The conference takes place June 13-17th, 2015. Watch for further details about the conference at the website:

<http://www.csc2015.ca/>

Note: Analytical Chemistry Division Annual Meeting The ACD annual general meeting will be held on Monday June 15th during the CSC Conference. Please visit the conference website for the time and location.

Note: Analytical Chemistry Division Annual CSC Dinner Well attended and a tradition for the last couple of decades, the annual dinner for the ACD will be held on Monday June 15th during the CSC Conference at a local restaurant. All students are welcome and typically receive discounted meals. After dinner activities are always a highlight! Details will be posted on anchem.ca by the end of May.

CSC 2015 STUDENT POSTER COMPETITION

There will be both Undergraduate and Graduate Poster Awards at CSC 2015 in Ottawa. All analytical Posters will be presented on Sunday June 14th 2015.

Undergraduate Student Conferences – 2015

Southern Ontario Undergraduate Student Chemistry Conference (SOUSCC)

University of Toronto, Mississauga campus, Mississauga, ON, March 21st, 2015.

Information: <http://www.utm.utoronto.ca/souscc/welcome>

Western Canadian Undergraduate Chemistry Conference (WCUCC)

University of British Columbia, Okanagan campus, Kelowna BC, May 7-10th, 2015.

Information: <http://wcucc2015.com/>

ChemCon (CIC-APICS Atlantic Student Chemistry Conference)

University of New Brunswick, Fredericton NB, May, 2015. May 21-23rd, 2015.

Information: <https://scienceatlantic.ca/conferences/index.php/chem/chem2015>

Colloque de chimie de l'Université de Sherbrooke

The 2015 edition will take place on October 16th, 2015.

Information: <http://colloque-chimie.evenement.usherbrooke.ca/>

Analytical awards at student conferences – 2014 - 2015

ChemCon 2014

ChemCon 2014 - Science Atlantic - CIC Chemistry Conference

May 22-24th 2014, Acadia University

<http://scienceatlantic.ca/conferences/>

Best Undergraduate Oral Presentation – **Teles Furlani**, Memorial University

Best Undergraduate Poster Presentation – **Sasha Power**, Saint Mary's University

Best Graduate Oral Presentation – **Scott Harroun**, Saint Mary's University

Best Graduate Poster Presentation – **Reem Karaballi**, Saint Mary's University

Science Atlantic Undergraduate Research Award – **Ashley Robinson**, Saint Mary's University

CBGRC 2014

17th Annual Chemistry and Biochemistry Graduate Research Conference

November 28th, 2014

Concordia University

Best Oral in Analytical chemistry – **Nausheen Sadiq** from Queen's University

Best Poster in Analytical chemistry – **Matthew Edwards** from University of Waterloo

SOUSCC 2015

Southern Ontario Undergraduate Student Chemistry Conference, March 21st, 2015

Mississauga, ON

<http://www.utm.utoronto.ca/souscc/welcome>

Analytical Winners

1. **Bach Kim Nguyen**, York University
2. **Seowoo Kim**, University of Western Ontario
3. **Jeffrey D. Henderson**, University of Western Ontario

Analytical Chemistry Presentation Awards at Undergraduate Student Conferences

Each of the four regional undergraduate conferences are eligible to receive financial support for awards in oral or poster presentations on a topic related to analytical chemistry. A request from the conference organizers should be made to the ACD Chair (chair@ANchem.ca). Judging is the responsibility of designated faculty members in attendance at the meeting. Organizers should later notify the ACD Chair of the award winners.

Announcement of 2015 Analytical Chemistry Division Awards

Fred Beamish Award 2015

Sponsored by the Analytical Chemistry Division, CIC

Janine Mauzeroll, McGill University

Award presentation during CSC: Wednesday June 17th at 11:40 in room 202

Maxxam Award 2015

Sponsored by Maxxam Analytics

David Chen, University of British Columbia

Award presentation during CSC: Wednesday June 17th at 11:00 in room 202

W.A.E. McBryde Medal 2015

Sponsored by AB Sciex

Hua-Zhong (Hogan) Yu, Simon Fraser University

Award presentation during CSC: Wednesday June 17th at 10:20 in room 202

2015 ACD Undergraduate Student Travel Award

Mélina Drouin, Université Laval (Supervisor: Denis Boudreau)

Award presentation during CSC: Sunday June 14th at 15:00 in room 212

2015 Ryan-Harris Graduate Student Award

Yiman Wu, University of Alberta (Supervisor: Liang Li)

Award presentation during CSC: Wednesday June 17th at 9:40 in room 202

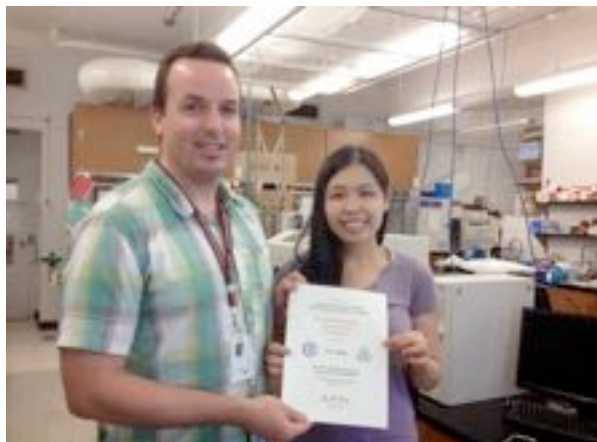
News

The updated Exec Members contact list is on our website: <http://www.anchem.ca/about.html>

Graduate and Undergraduate Student Poster Awards in Analytical Chemistry at CSC 2014

Graduate poster winner:

Vi Dang (Right) with supervisor, Dr. Philip Britz-McKibbin



Graduate poster winner:

Roxana G. Jayo; supervisor Dr. David Chen



Graduate poster winner:

Jonathan Gallant (Right) with supervisor Dr. Kevin Thurbide



Undergraduate student poster awardees

with supervisors (Left to right: Dr. Russ Algar, Woohyun Jennifer Moon, Nathan Paisley, Hyungki Kim, Dr. Charles Lucy)

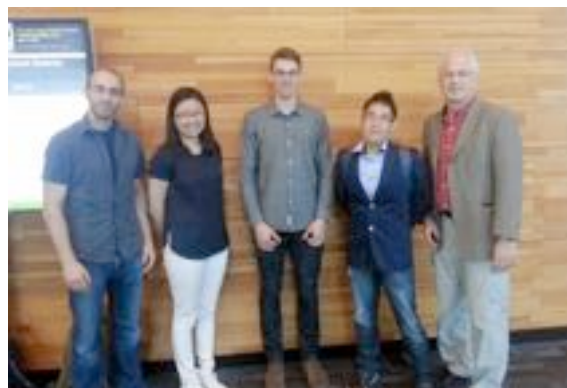


PHOTO GALLERY
2014 Analytical General Meeting and Dinner



At the 2014 CSC Meeting in Vancouver, the Annual General Meeting of the Analytical Division went to the revolving restaurant in downtown Vancouver! A large number of participants enjoyed food, drink, conversation and the stunning views of Vancouver. Special thanks to Dr. Paul Li for organizing the event and to the Chemistry Department of the University of Alberta for financial support!

Make sure you join our next Analytical division annual general meeting (AGM) and dinner in Ottawa. Details will be communicated in the analytical symposium during the conference.



FORMER STUDENT PROFILE: MEET Dr. Sandy S. Zhao

Title: Sr Method Development Chemist
Company: Bimeda-MTC Animal Health Inc.
Undergraduate Institution: University of Toronto
Graduate Institution: Université de Montréal
PhD Supervisor: Prof. Jean-Francois Masson



Favorite Memory of Graduate School:

Our entire research group would often hang out in one of our offices or at a nearby pub on Friday afternoons. It was especially memorable because we would spend hours discussing ideas, talking about life, sharing laughter, seeking advices and sometimes finding comfort and support from others through bad times. I am also grateful that I had several opportunities to travel for national and international conferences together as a group. We were not only exposed to a stimulating environment for scientific exchanges but also had the chance to visit the city which hosted the event.

Hardest Thing After Graduating:

It was hard for me to transition from having a work routine to a more flexible schedule. I didn't find work right after graduation so I stayed home and focused on job search. I rapidly realized that work experience is highly valued in the industry and it was difficult to get the first interviews. Following the advice of friends, I have refocused my approach to put forward my skill set instead of my academic accomplishments.

Nicest Thing After Graduating:

It felt fantastic to finally attain a goal that I have established for myself and be able to close a big chapter of my life. I booked a nice trip with my mom as a reward for completing my degree so I was really looking forward to claim my 'reward' after graduating.

How I Came to My Current Position:

I knew that I wanted to get into the industry after graduating so I put a lot of effort in writing a professional resume to draw the attention of potential industrial employers. I also turned to my friends who already have some years of experience in the industry for advices. They made me realize that my resume was too lengthy and academic-oriented! The essential transferrable skills developed during my graduate studies were not emphasized. To my surprise, my updated version of the resume scored me an interview with the current company that I work for.

Best Career Advice I Ever Received:

Sometimes we tend to pre-define what we are capable of and what we are not. Resist the temptation to set limits for yourself; to put yourself in a box. In order to advance in your career, challenge yourself with tasks which push you outside of your comfort zone in order to acquire a new skill, it will help you grow.

Analytical Chemistry Students Should:

Equip him/herself with problem-solving and research skills. Be systematic and ask pertinent questions. Develop a detail-oriented personality. Adopt a positive can-do attitude to all challenges in life.

If you have suggestions for candidates for "Former student profiles", please send them to jf.masson@umontreal.ca

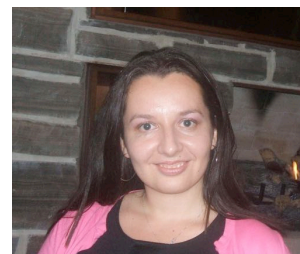
FACULTY PROFILE:

Dajana Vuckovic, Assistant professor
Department of Chemistry and Biochemistry
Concordia University

dajana.vuckovic@concordia.ca

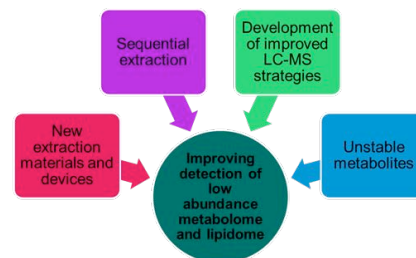
<http://www.concordia.ca/artsci/chemistry/faculty.html?fpid=dajana-vuckovic>

MEET Dr. Dajana Vuckovic



Dajana Vuckovic holds Honours B.Sc. in Chemistry from the University of Toronto and Ph.D. in Analytical Chemistry from the University of Waterloo. Her doctoral research focused on the development of in vivo solid-phase microextraction methodology for global metabolomics of blood in order to eliminate the need for blood withdrawal/collection under supervision of Prof. Janusz Pawliszyn. In 2010, she joined the group of Prof. Andrew Emili in the Donnelly Centre at the University of Toronto for NSERC post-doctoral fellowship in chemical proteomics. Since December 2012, Dajana is an Assistant Professor of Bioanalytical Chemistry at the Department of Chemistry and Biochemistry at Concordia University where she leads an active research group in analytical and clinical metabolomics. Dajana is the winner of the 2014 Petro Canada Young Innovator Award, and serves on editorial board of *Bioanalysis* journal. To date, she has co-authored over 28 publications and 9 book chapters. Her review article entitled "Current trends and challenges in sample preparation for global metabolomics using LC-MS" was recognized as Top 10 article of 2012 in *Anal. Bioanal. Chem.*

Vuckovic group's primary focus is to develop new and improved methods to study low abundance metabolome in biological fluids and tissues. To accomplish this goal, we are investigating novel selection extraction materials including functionalized poly(*N*-isopropylacrylamide)-based microgels in collaboration with Serpe group at the University of Alberta, ionic liquids and nanoparticles for their ability to enrich particular classes of metabolome. Secondly, we are performing systematic comparisons of these new optimized protocols as well as traditional liquid-based and solid-phase based sample preparation methods to identify most orthogonal approaches to use in sequential extraction format. To the best of our knowledge, we are also the first group to perform systematic studies of ionic liquids for the extraction of metabolites across wide polarity range, efforts which in the future could lead to improved rational design of ionic liquids and better predictive modelling of metabolite/ionic liquid interactions for this application. Finally, we are also focusing our efforts on improving chromatographic separation and MS detection in global metabolomics. For example, we recently showed that mixed-mode chromatography can be highly complementary to HILIC chromatography as summarized in figure on the left. **The main goal of our combined efforts is to capture low abundance metabolites missed in generic approaches without increasing LC-MS analysis time per sample or the amount of sample required for analysis.**



Overall, improved fundamental and applied knowledge of the effect of extraction method in global metabolomics will facilitate better study design and contribute towards more successful biomarker discovery and validation efforts. We currently apply our newly developed tools to clinical applications such as investigating the role of high protein diet in development/progression of cardiovascular disease and improving diagnosis and treatment of bipolar disorder. Beyond the scope of analytical and clinical metabolomics, our group has also developed highly-sensitive LC-MS method for simultaneous multi-class monitoring of 20 mycotoxins in human blood, and built an in-house LC-MS library of their common metabolites. We now plan to apply this method for exposure monitoring studies of Canadian population. Except for ochratoxin A data obtained in 1990s, no such data exists for Canada despite the fact that contamination of Canadian food chain with mycotoxins is well-documented in literature with up to 70% of food samples testing positive for one or more mycotoxins in recent surveys. We hope that our new method will assist regulatory efforts to decrease Canadian exposure to mycotoxins and improve the safety of Canadian food supply.

Student Cover Art

by Jiayin Bao, York University

Kinetic Size-Exclusion Chromatography with Mass Spectrometry Detection (KSEC-MS)

The artwork describes the concept of KSEC-MS in three steps. 1. Mixing and separation. The small molecule and protein are sequentially injected into a size-exclusion column (t_0). The protein, which moves faster, approaches and binds to the small molecule and form complex (t_1). After binding, the protein and complex move beyond the zone of small molecule (t_2), therefore allowing the complex begins dissociating. The released small molecule is continuously separated from the complex and creates a bridge between them (t_3). 2. Mass spectrometry detection. The eluate from the column is continuously sampled into the ion source of a mass-spectrometer, which is tuned to detect small molecule only. The blue rods represent protein while the red dots represent small molecule. The resulting KSEC-MS chromatogram contains two peaks and a bridge between them. 3. Data processing. The experimental KSEC-MS chromatogram is numerically fitted with a computer-simulated one. The values of k_{on} and k_{off} are used as fitting parameters and the best fit corresponds to the sought correct values of k_{on} and k_{off} .



Jiayin Bao is a Ph.D student of Professor Sergey N. Krylov in analytical chemistry at York University. Her research focuses on development of novel drug screening methods by combining various separation methods with mass spectrometry detection. Over the past 4 years, she has contributed to the development of Kinetic Capillary Electrophoresis-Mass Spectrometry (KCE-MS) and Kinetic Size-Exclusion Chromatography-Mass Spectrometry (KSEC-MS). Both works are focused on kinetic analysis of drug-target interactions under label-free solution-based conditions. She is now working in collaboration with AB Sciex and GlaxoSmithKline on practical screening methods for selection of drug leads from highly-diverse

combinatorial libraries.

To have your work featured as the next newsletter cover page, submit your artwork to:

Dr. Jean-Francois Masson
jf.masson@umontreal.ca

IF TV SCIENCE WAS MORE LIKE REAL SCIENCE



Have a suggestion or an item for the next Newsletter? Let us know!

e-mail: jf.masson@umontreal.ca