

THE GOLD STANDARD

Student Newsletter

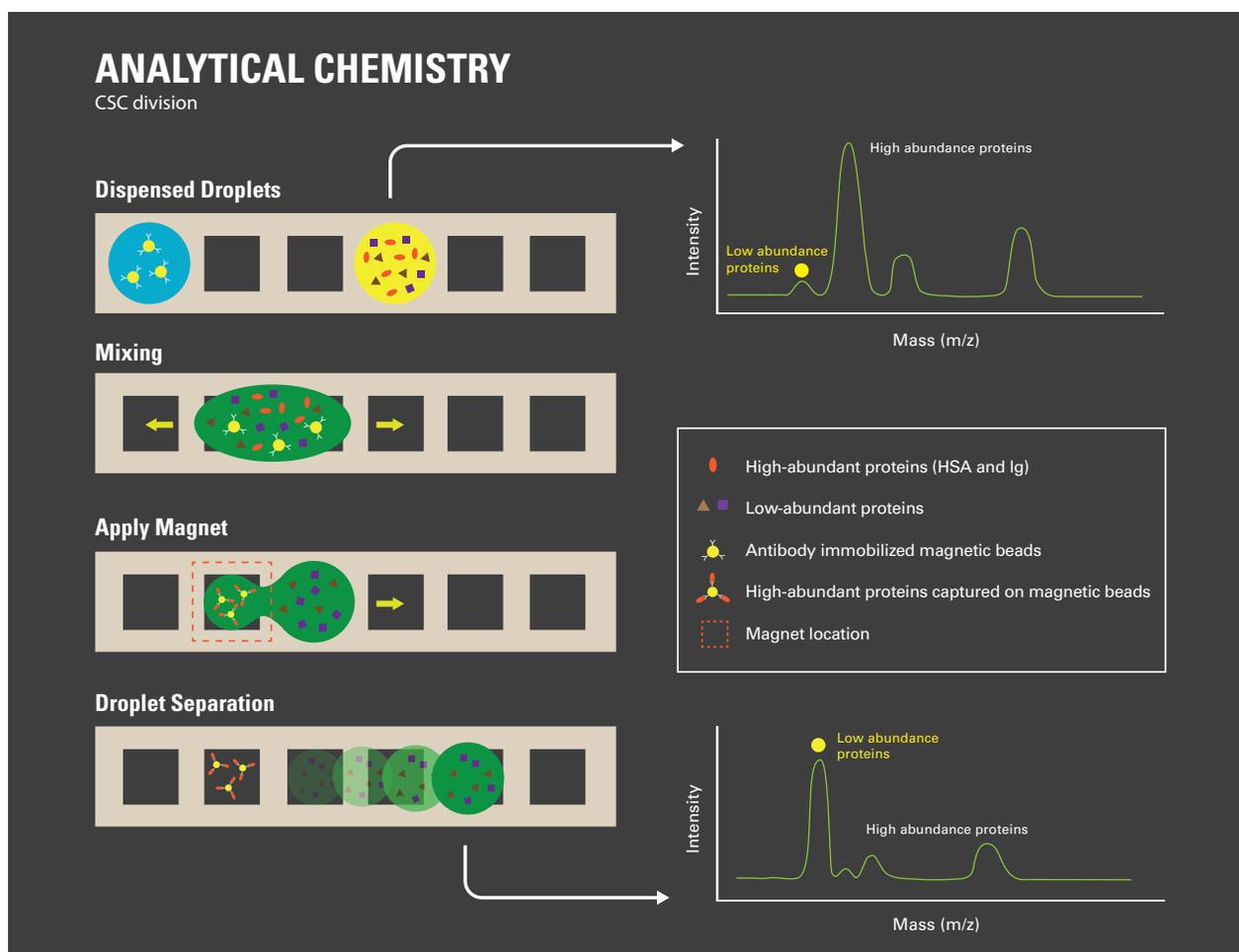
Analytical Chemistry Division

The Chemical Institute of Canada

Fall 2013

In This Issue:

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



Cover Art by Ningsi Mei, Queen's University

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 NEW ways to stay informed!

1. Visit our new ACD website ANchem.ca



Chemical Institute of Canada | *For Our Future*

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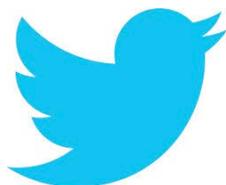


What is the ACD?

The Analytical Chemistry Division (ACD) has been established by the Board of Directors of the Chemical Institute of Canada (CIC) for Members of the Institute who have a common interest, experience and/or training in the analytical chemistry sub-discipline of chemical sciences.

The purpose of the Division is to further and promote the interests of all of the members of the Division involved in the pursuit of and understanding of analytical chemistry within the Division.

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 2014

Dates and venues for the 60th edition remain to be announced.

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

CSC 2014 – Vancouver

The 97th annual Conference of the Canadian Society for Chemistry will be held this year in Vancouver. The conference takes place June 1-5th, 2014. Watch for further details about the conference at the website:

<http://www.csc2014.ca>

Note: Analytical Chemistry Division Annual CSC Dinner Well attended and a tradition for the last couple of decades, the annual dinner for the ACD is held on a suitable night during the CSC Conference at a local restaurant. All students are welcome and typically receive discounted meals. After dinner activities are always a highlight! Keep your ears open for announcements concerning the date and location.

Undergraduate Student Conferences – 2013 - 2014

Southern Ontario Undergraduate Student Chemistry Conference (SOUSCC)

University of Windsor, March 2014.

Information: To be announced later

Western Canadian Undergraduate Chemistry Conference (WCUCC)

University of Victoria, May 1st – 3rd, 2014.

Information: <http://web.uvic.ca/~wcucc/>

ChemCon (CIC-APICS Atlantic Student Chemistry Conference)

Acadia University, Wolfville, NS May 22nd – 24th, 2014.

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

Be sure to watch for more information on these conferences in the coming months.

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.

2013 ANALYTICAL STUDENT AWARD WINNERS

2013 Graduate Student Award in Honor of Walter Harris

Chang Liu from the University of British Columbia (Ph.D. Supervisor: Dr. David Chen). The title of Daniel's award presentation was "Towards Continuous Chemical Purification and Super-Resolution Microscopy on Microfluidic Platforms", and it was presented at the 2013 CSC meeting in Quebec City.



2013 Graduate Poster Awards

Samuel Ouellet, First Place, Université Laval (Dr. D. Boudreau, supervisor), "Bi-modal (Luminescence/Scattering) Microscopy Platform for the Characterization of Fluorescent Plasmonic Nano-Assemblies"

Carmen Carrasquilla, Second Place, McMaster University (Dr. J. Brennan, Dr. Y. Li, supervisors), "Developing Concatemeric Structure-Switching Signaling DNA Aptamers Using Rolling Circle Amplification"

Uvaraj Uddayasankar, Honorable mention, University of Toronto Mississauga (Dr. U. Krull, supervisor), "Investigating the Use of Quantum Dot DNA Monoconjugates for Sensitive Nucleic Acid Detection".

Kha Tram, Honorable mention, McMaster University (Dr. Y. Li, supervisor), "Development of DNA-based Probe for Rapid Colormetric Detection of Pathogenic Bacteria".

ABOUT THE STUDENT AWARDS

ACD Undergraduate Student Travel Award

The intent of the award is to honor outstanding senior undergraduate students in analytical chemistry, to encourage them into postgraduate studies and to expose them to a stimulating scientific environment at the annual Canadian Chemical Conference.

The Undergraduate Student Travel awards are open to all undergraduate students pursuing studies in the area of Analytical Chemistry and in attendance at a Canadian University. The winner is expected to give a poster or oral presentation of his/her work at the 2014 CSC conference (Vancouver, BC).

One award will be given this year, in the form of a travel/conference expense reimbursement up to \$500. The application package should contain:

- a copy of the student's transcript, and
- one supporting letter

Supervisors should email their nomination to Dr. Jianjun Li (jianjun.li@nrc-cnrc.gc.ca) prior to January 24, 2014. Each supervisor may nominate one candidate per competition.

ACD Graduate Student Poster Award Vancouver 2014

Graduate students who will be making poster presentations in the Analytical Chemistry poster session are eligible for this award. Only one submission per student is permitted.

An *ad hoc* judging committee will be established. Committee members will question each candidate and assess the quality of the poster. Two cash awards will be given.

Students that wish to be considered for this award should contact the ACD Chair (chair@ANchem.ca) prior to the conference.

Douglas Ryan Award Walter Harris Award (Graduate Student award)

These prestigious awards, named in honour of two senior and well-known analytical chemists in Canada (Dr. Douglas Ryan of Dalhousie University and Dr. Walter Harris from the University of Alberta) are presented in alternate years to an outstanding senior graduate student in analytical chemistry in Canada.

Nominations are solicited from Canadian Universities each fall, by contacting both Chemistry Department Heads and all Professors who are active in research in analytical chemistry. The selection of the recipient is made on the basis of outstanding research contributions and the excellence of the academic record.

The recipient of the award, who receives a cash award and framed certificate, is expected to make a presentation at the next annual CSC meeting. The awardee and supervisor are invited to attend the ACD Award Reception, normally held after the Annual General Meeting of the ACD at the annual CSC conference.

The nomination should contain the following:

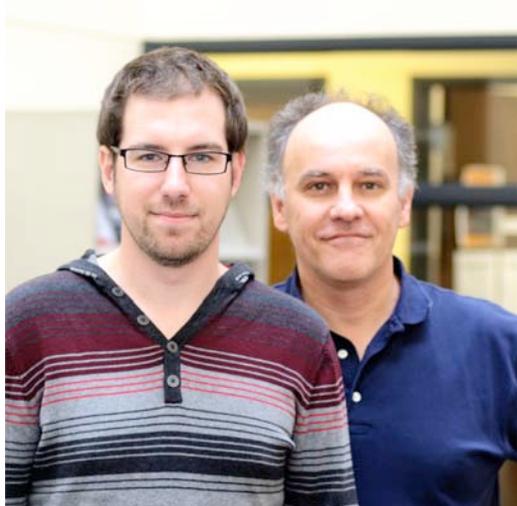
1. Two letters of recommendation, one of which must be from the nominee's research supervisor and include the reasons why the nominee is deserving of the Award.
2. A brief statement about the thesis research project (to be submitted by the candidate).
3. A list of research contributions (to be submitted by the candidate).
4. Transcripts of the student's undergraduate and graduate academic records.

Nomination materials should be emailed to Dr. Nicole Baryla (nicole.baryla@oicr.on.ca) prior to January 24, 2014.

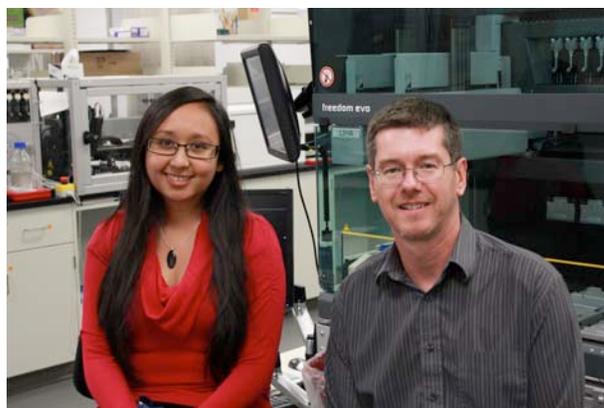
PHOTO GALLERY

Graduate Student Poster Awards at CSC 2013

Samuel Ouellet (Left) with supervisor, Dr. Denis Boudreau



Carmen Carrasquilla (Left) with supervisor Dr. John Brennan



Uvaraj Uddayasankar (Right) with supervisor Dr. Ulrich Krull



Kha Tram (Right) with supervisor Dr. Yingfu Li

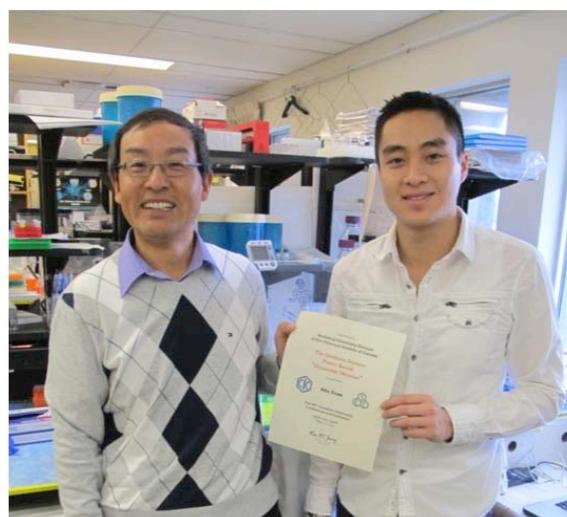


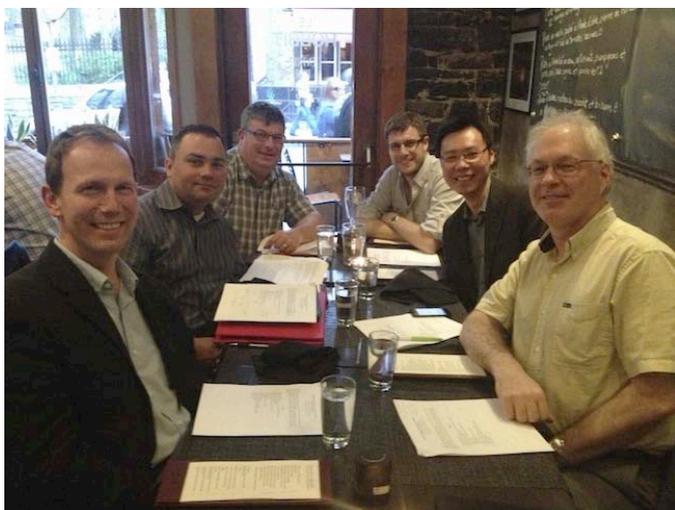
PHOTO GALLERY

2013 Annual General Meeting and Dinner



At the 2013 CSC Meeting in Quebec City, the Annual General Meeting of the Analytical Division went to the old city in Quebec! A large number of participants enjoyed food, drink, and conversation in the cozy setting of the restaurant. Special thanks to Dr. Denis Boudreau for organizing the event!

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



Your Executive committee at work!

FORMER STUDENT PROFILE: MEET Dr. Chady Stephan

Title: Product Specialist

Company: PerkinElmer Canada

Undergraduate Institution: Lebanese University

Graduate Institution: Université de Montreal

Ph.D. Supervisors: Sébastien Sauvé et Michel Fournier



Favorite Memory of Graduate School:

It was presenting at the Society of Environmental Toxicology and Chemistry (SETAC) in Uppsala, Sweden. It was my first international conference and it introduced me to great new techniques that I am currently still using as well as meeting great researchers that helped build my research network.

Hardest Thing After Graduating:

Unfortunately, it was finding a job in my related field (analytical chemistry). Through networking, I was able to get my first professional job as a project manager at QSAR risk assessment services. There, I learned a lot of project management skills and the business aspect of the corporate world.

Nicest Thing After Graduating:

I can't be specific to one particular event, but it's a continuous feeling that all the hard work and the studies have finally paid off.

How I Came to My Current Position:

Through a friend who sent me an email indicating that PerkinElmer is in search of an individual with my exact credentials.

Best Career Advice I Ever Received:

Difficult to cite my ultimate one, but here are a couple: "Remember no one knows about your project more than yourself", "Never burn a bridge" and "When we all think alike, no one thinks very much" – Albert Einstein

Analytical Chemistry Students Should:

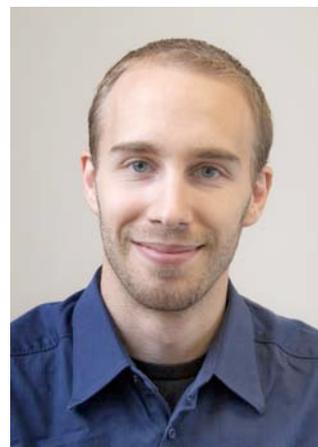
Get hands on experience on instruments and to try to learn as many techniques as possible during your studies.

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

FACULTY PROFILE:

MEET *Dr. Russ Algar*

Professor Russ Algar
University of British Columbia
Bioanalytical chemistry
algar@chem.ubc.ca
<http://groups.chem.ubc.ca/algar/Home.html>



My group's research focuses on harnessing the unique properties of nanoparticles for bioanalytical applications. We are (i) developing point-of-care diagnostics; (ii) investigating effects of nanoparticle interfaces on biomolecular activity; and (iii) designing new nanoparticle probes for quantitative, real-time tracking of cellular processes.

Our long-term goal is to develop a new set of tools for biomedical research and frontline healthcare. Healthcare is one of the biggest national and global concerns, and faces numerous challenges in its delivery and efficacy. At an applied level, there is a critical need for diagnostic devices that can provide fast, reliable results at points of patient care, at low-cost, and without being resource intensive. In Canada, patients in urban centres must deal with a capable but overburdened healthcare system, and patients in remote areas face local healthcare that is poorly equipped. Point-of-care (POC) diagnostic devices have much potential to alleviate these strains on the healthcare system. More fundamentally, there is also a need to better understand the biological processes important in disease pathogenesis. Advances in understanding the complex underlying biology will permit earlier diagnoses and selection of treatments based on prognosis, ultimately leading to better outcomes for patients. Addressing these applied and fundamental challenges will require new bioanalytical tools.

Our research program focuses on the use of quantum dots (QDs) and other optically active nanomaterials as platforms for addressing challenges in bioanalysis. QDs are semiconductor nanocrystals that exhibit bright, spectrally narrow, and tunable photoluminescence in combination with spectrally broad, strong light absorption. The nanocrystal structure also provides an interface that can be chemically tailored and biologically functionalized. Led by a group of talented students, projects in our lab are currently focused on fundamental and applied aspects of utilizing QDs and other nanomaterials for POC diagnostics and analysis of cellular processes.

Point-of-care diagnostics. Our lab has recently developed methods for *quantitative* assays of enzymes using consumer CMOS devices such as smartphone cameras and webcams in combination with low-cost, low-power LEDs. This research takes advantage of the bright, spectrally narrow emission of QDs. Recent developments include paper test-strip assays and multiplexed, homogeneous assays of proteolytic activity. One of the guiding principles of this research is that our methods should either not require anything more than a USB connection to a laptop computer or a mobile device.

Student Cover Art

by Ningsi Mei, Queen's University

A Digital Microfluidics Platform for the Human Plasma Protein Depletion

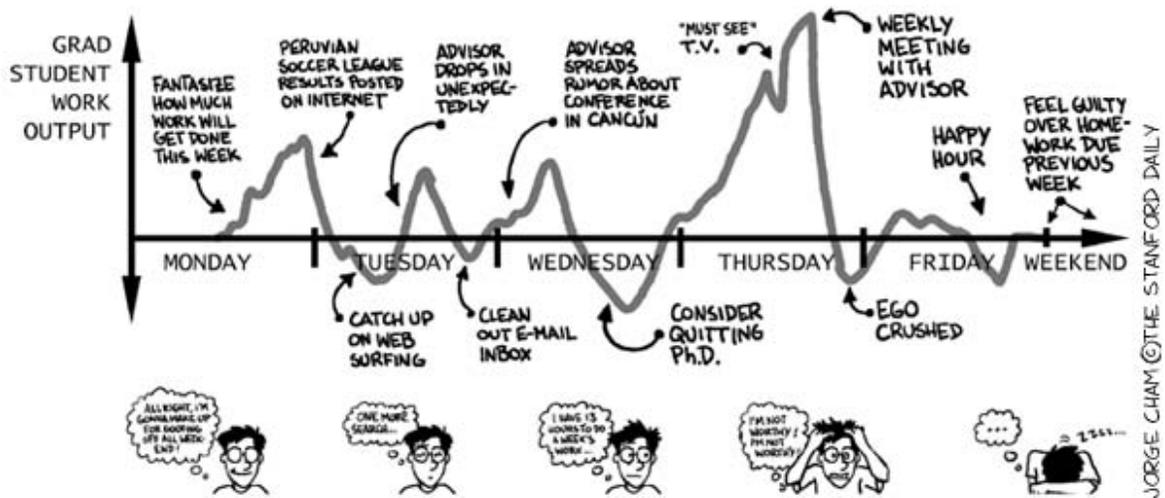
The artwork describes a three-step human plasma protein depletion process on a digital microfluidics (DMF) platform. First, a droplet containing antibody immobilized magnetic beads is mixed with a droplet of human plasma. Next, a magnet is applied underneath the DMF device to hold the beads in place while the droplet containing unbound proteins is actuated away from the retained beads. Lastly, the separated droplet containing unbound proteins is moved away from the beads. Using this approach, the depleted protein droplet has remained relatively the same size, and can be subjected to further offline analysis using MALDI mass spectrometry (MS). MALDI MS results show that following extraction, the low-abundant protein signal increased significantly whereas high-abundant proteins are mostly removed from the droplet.



Ningsi Mei is a master's student of Professor Richard Oleschuk in analytical chemistry at Queen's University. Prior to coming to Queen's, Ningsi completed her bachelor's degree in honours chemistry at McGill University with three scientific publications. She was awarded Canada Graduate Scholarship by NSERC during her studies at Queen's. She has been working on applications related to digital microfluidics and presented her work at the CSC 2013 conference in Quebec City. She is now working in collaboration with Professor Aaron Wheeler at the University of Toronto using antibody immobilized magnetic beads for human plasma protein depletion.

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artwork to:**

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



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e-mail: jf.masson@umontreal.ca