



**Canadian Biomaterials Society**  
**Soci t  Canadienne des Biomat riaux**

**Quarterly Newsletter**

**Fall 2015**



**Letter from the President: Lauren Flynn**

Dear Colleagues,

It's a very exciting time for the CBS, as we will be hosting the 10<sup>th</sup> World Biomaterials Congress (<http://www.wbc2016.org>) in Montreal from May 17 – 22, 2016. Our members are playing an important role in all aspects of the conference organization, and we can look forward to welcoming the world and showcasing the broad range of exciting biomaterials research being conducted across Canada on a global platform next Spring.

It is a great honour to serve as the CBS President and to have the opportunity to work with an outstanding Board of Directors who are strongly committed to supporting our membership. Over the past few months, one of our top priorities has been establishing Awards to recognize the significant accomplishments and contributions of leaders in our Canadian biomaterials research community. As highlighted in this newsletter, Dr. John Brash is the inaugural winner of the *CBS Lifetime Achievement Award* and Dr. Todd Hoare is the inaugural winner of the *CBS Early Career Investigator Award*. Drs. Brash and Hoare will be featured as keynote speakers in a Special CBS Symposium at the WBC 2016.

I'm very pleased to report that all 5 Student Chapters have been actively engaged in recruitment and activity planning for the coming year, as detailed in the newsletter updates. We hope to promote greater interaction amongst the Chapters over the coming year, and encourage interested students and fellows in other regions to consider establishing new local programs. As a Board, we will continue to actively support initiatives that help to foster our next generation of biomaterials researchers, including travel awards for both student and PDF members to the upcoming WBC 2016.

I wish everyone a happy holiday season, and I look forward to working together to make 2016 a landmark year for our Society. See you in Montreal!

Lauren

**Letter from the President-Elect: Todd Hoare**

Dear Colleagues,

I am honoured to have been selected as CBS President-Elect to take the reins of CBS in 2016-2017. In that role, I am looking forward to building on the momentum generated by the upcoming World Congress in Montreal to raise awareness of Canadian biomaterials research and engage CBS members

across the country. In particular, I am excited to help to expand and fortify our growing network of student chapters across the country, build on connections made at WBC to increase the involvement of industry in CBS, and explore ways to further serve CBS members through scholarships, awards, exchange opportunities, and other initiatives aiming to reward the best in Canadian biomaterials research and promote mobility amongst biomaterials research groups throughout the country. I hope to connect (or re-connect) with many of you during WBC 2016!

Todd

**Introducing our new Board Member: Sophie Lerouge**

Dr. Sophie Lerouge is a Professor at Ecole de technologie sup rieure ( TS) and researcher at the CHUM research center (CRCHUM) in Montreal. Her research interests include the development of bioactive coatings and injectable hydrogels for vascular applications, cell therapy and tissue engineering. She is the mentor of the Montreal Student Chapter and leader of the student activity committee for the WBC 2016. She has already been a member of the CBS Board of Directors in 2009-2011 and is looking forward to serving again over the next two years.

**Introducing our new Board Member: Douglas Hamilton**

Dr. Douglas Hamilton is an Associate Professor in the Departments of Oral Biology and Anatomy & Cell Biology at Western University. He is also the Chair of Oral Biology, and a member of the Graduate Program in Biomedical Engineering. The focus of his research program is on cell-material interactions, development of natural biomaterials for soft tissue reconstruction, wound healing and angiogenesis, and the influence of topographical features on cell adhesion and contractility. He is looking forward to serving for the first time on the CBS Board of Directors.

**Introducing our new Student Representative on the Board: Ross Fitzsimmons**

Ross Fitzsimmons is a Ph.D. candidate at the University of Toronto in the Institute of Biomaterials and Biomedical Engineering. As a member of Prof. Craig Simmons' cellular mechanobiology lab, he is focused on developing strategies for engineering

vascularized tissues ex vivo and is interested in the roles biochemical and mechanical cues play in microvessel formation and maturation. He looks forward to helping improve the student experience within the society while serving as a member of the CBS board. He has also been active in the preparations for WBC2016 and looks forward to seeing everyone in Montreal next year!

### **Inaugural CBS Lifetime Achievement Award Winner – Dr. John Brash**



Dr. John L. Brash, a Distinguished University Professor at McMaster University and a Fellow of the Royal Society of Canada, is the inaugural winner of the CBS Lifetime Achievement Award. Dr. Brash has been conducting pioneering research in the fields of polymeric biomaterials and protein-surface interactions

for more than 45 years. More specifically, Dr. Brash is internationally recognized for his landmark contributions in the areas of protein adsorption and blood compatibility, the development of biomedical polyurethanes, and the application of surface modification techniques to control cell adhesion. His seminal research in these areas has shaped our current understanding of cell-biomaterial interfaces, and has also helped to revolutionize the use of polymers in the medical device industry. With more than 300 lifetime publications, he has received numerous awards recognizing his research excellence in the biomaterials field, including the Clemson (1994) and Founders (2009) Awards from the Society for Biomaterials. Further, Dr. Brash has been a leader in the Canadian biomaterials community, and an outstanding mentor to many young scientists and engineers who have gone on to successful careers in academia and industry.

### **Inaugural CBS Early Career Investigator Award Winner – Dr. Todd Hoare**



Dr. Todd R. Hoare, an Associate Professor of Chemical Engineering at McMaster University, is the inaugural winner of the CBS Early Career Investigator Award. Dr. Hoare has rapidly gained world-wide recognition for his work on environmentally-responsive hydrogels for both controlled drug delivery and tissue

regeneration applications. In this context, his lab has made seminal contributions to the field of “smart”

materials-based technologies, including remote-controlled drug release and hydrogels that can elicit tunable cellular responses. For his outstanding research achievements, Dr. Hoare was recently named a McMaster University Scholar, and has received, among others, the John Charles Polanyi Prize in Chemistry and an NSERC Innovation Challenge Prize.

### **CBS Visiting Scholar Award Winner – Juliana Valencia-Serna**



The CBS is pleased to announce Juliana Valencia-Serna is the winner of the 2015 CBS Visiting Scholar Award.

*Q: What research will you conduct with the support of this Award?*

*A:* My PhD research at the University of Alberta under the supervision of Dr. Hasan Uludag focuses on the development of novel biomaterials for leukemia therapies. This research involves the generation of amphiphilic polymers and the evaluation of their ability to deliver molecular therapies (siRNA specifically) in leukemia models. The results of these studies have identified lipid-substituted polyethylenimines that effectively delivery siRNA in chronic myeloid leukemia (CML) cell lines. Moreover, this polymeric delivery system facilitates the therapeutic targeting against oncogenes, such as BCR-ABL, which results in decreased cell growth and increased cell death of CML cell lines. The next goal of my project is to evaluate the performance of these polymeric delivery systems on cells obtained from human leukemia patients. This part of the project is being performed in collaboration with Dr. Xiaoyan Jiang from the University of British Columbia. The expertise of Dr. Jiang’s lab in CML, the access to leukemia patient samples, the technical expertise of culture and purification of stem cell portion of CML patient samples, and the specialized assays for their evaluation will provide me with the training and tools required to achieve this goal. The CBS Visiting Scholar Award will facilitate this collaborative research by providing me with the opportunity to train in Dr. Jiang’s lab at the University of British Columbia. The acquired techniques and expertise will be applied at the Uludag lab so that we can advance in the development of novel therapies for leukemia.

<http://biomaterials.ca/#!/visitingscholarvalencia-serna>

Applications for the 2016 Visiting Scholar Award are due on **July 1, 2016** – interested students are encouraged to consult the [CBS website](#) for additional information.

## Recap of the CBS 2015 Annual Meeting

Dr. Todd Hoare organized an outstanding CBS Annual Meeting, which was held at the University of Toronto from May 27 – 30, 2015. With a theme of "Next Generation Biomaterials", the conference featured the latest biomaterials research from across Canada and around the world, including seven invited keynote presentations from internationally-recognized experts in a range of emerging research areas. The meeting was a great success, with 232 attendees. We would like to thank all of our sponsors for their support and congratulate the following travel and presentation award winners!

### Travel Awards

*Kyle Battiston, University of Toronto*  
Macrophage effects on in vitro tissue regeneration when in co-culture with vascular smooth muscle cells on a degradable polyurethane under biomechanical strain

*Yasaman Delaviz, University of Toronto*  
Synthesis of Ciprofloxacin Releasing Di-Vinyl Monomer for Dental Adhesive Systems

*Ludivine Hugoni, University of Toronto*  
Fibronectin adsorption on surface modified polyetherurethanes for blood-contacting applications

*Ghulam Jalani, McGill University*  
Lanthanide-doped upconversion nanoparticles: non-invasive trackers for real-time hydrogel degradation monitoring in-vivo

*Mathieu Maisani, Laval University*  
Hybrid hydrogel as a microenvironment for tissue engineering: A new matrix for bone regeneration

*Arash Momeni, Dalhousie University*  
Polyphosphate Coacervates as Hemostatic Agents

*Vanessa Montano-Machado, Laval University*  
Comparative Study on Adsorbed and Grafted Fibronectin Coatings on Fluorocarbon Surfaces for Cardiovascular Applications

*Zeina Salloum, University of Ottawa*  
HIF-1 $\alpha$  Expression and Oxidative Damage in RAW264.7 Murine Macrophages Exposed to Cobalt and Chromium Ions

*Qiong Wang, University of British Columbia*  
New insights into the corrosion products from modular total hip implants

*Fei Xu, McMaster University*  
Direct Electrospinning of Degradable Hydrogel Nanofibres

*Stuart Young, Queen's University*  
Design and evaluation of a polymer hydrogel scaffold for the delivery of adipose-derived stem cells for the treatment of peripheral arterial disease

*Claire Yu, Queen's University*  
Tissue-specific Microcarriers for Adipose-derived Stem Cell Expansion and Delivery

### Presentation Awards

*Yasaman Delaviz, University of Toronto*  
Synthesis of Ciprofloxacin Releasing Di-Vinyl Monomer for Dental Adhesive Systems

*Sabrina Hodgson, McMaster University*  
Tuning Gelation Time and Mechanical Properties of Injectable Poly(Ethylene Glycol) Hydrogels Using Strained Alkyne–Azide Cross-Linking

*Nima Khadem Mohtaram, University of Victoria*  
Glial cell-derived neurotrophic factor-releasing nanofibers with varied topographies for neural tissue engineering applications

*Alexander Lausch, University of Toronto*  
The role of extracellular matrix components on the mineralization of the periodontium

*Jennifer Logie, University of Toronto*  
Tuning Polymeric Micelle Stability and Drug Loading with Chemical Modifications

*Somiraa Said, Western University*  
Sustained Co-delivery of Fibroblast Growth Factors from Poly(ester amide) Fibers for Building Stronger Vessels

*Kimia Sorouri, McMaster University*  
Prostaglandin E(2) Reverses Scar Tissue Production in Human Kidney Epithelial

*Stuart Young, Queen's University*  
Design and evaluation of a polymer hydrogel scaffold for the delivery of adipose-derived stem cells for the treatment of peripheral arterial disease

*Moira Vyner, Queen's University*  
Polymer chain mobility dependent fetuin adsorption affects cell proliferation on elastomer surfaces

### Poster Awards

*Nina Bono, Laval University*  
An in vitro culture platform for small-caliber tubular biological structures

*Michael Byad, Laval University*  
Influence of Chemical Conjugation Strategies on the Bioactivity of Fibronectin

*Mattieu Gauthier, ETS-Montreal*  
Modeling the mechanical behavior of mono- and multilayer electrospun structures for vascular graft applications

*Gagan Minhas and Kingze Lu, University of Toronto*  
Effects of Ribose and Annealing on the Free Radical Content and Mechanical Properties of Gamma-Irradiated Sterilized Bone

*Jessica Ngai, University of Toronto*

Circumventing the Blood-Brain Barrier: Injectable hyaluronan-based hydrogel to deliver Cyclosporin A to promote tissue repair in stroke-injured rat brain

*Ava Parsian, University of Ottawa*

Optimization of Simvastatin Encapsulation in Alginate Microspheres

*Samantha Payne, University of Toronto*

Cell delivery using an injectable hydrogel to treat stroke

*Zeina Salloum, University of Ottawa*

HIF-1 $\alpha$  Expression and Oxidative Damage in RAW264.7 Murine Macrophages Exposed to Cobalt and Chromium Ions

*Laura Smith, University of Toronto*

Biomimetic Hydrogels for 3D Lymphangiogenesis Cell Culture

*Alexander Vlahos, University of Toronto*

Modifying Modular Tissue Engineering for Subcutaneous Pancreatic Islet Transplantation

## **WBC 2016 Update**

The upcoming [WBC 2016](#) promises to be an exciting international meeting, with over 3500 abstracts submitted by representatives from more than 60 different countries. The meeting is well on track to being the largest scientific gathering of biomaterials researchers to date. We are pleased to report that the Canadian community showed exceptional engagement, contributing 414 abstracts (ranking third in terms of number of submissions, behind the US and China). *Way to go Canada!* The Organizing Committee is continuing to work hard on coordinating the abstract review process, as well as securing additional sponsorship for the meeting. Conference registration will open and abstract notifications will be sent on Dec. 1, 2015. The deadline for registration if your abstract has been accepted for an oral or poster presentation will be [Jan. 21, 2016](#). The WBC 2016 will showcase the most recent advances in biomaterials research and promises to be an outstanding opportunity for networking and collaboration.

Students and PDFs interested in helping with technical support during the meeting are encouraged to contact [Dr. Diego Mantovani](#), and those interested in serving as welcoming ambassadors or contributing to the student activities committee are encouraged to contact [Dr. Sophie Lerouge](#).

## **Student Chapter Updates**

### **Update from the Alberta Chapter**

The Alberta Chapter kicked off the 2015 academic year with participation at the annual University of Alberta clubs fair to advertise and recruit more members, specifically targeting students from the undergraduate level to pique their interest in biomaterials research. This was followed by a BBQ fundraiser, which attracted a large attendance and was a great success. Several academic talks are planned for the upcoming academic year starting in early December 2015, including a seminar delivered by Dr. Michael Serpe from the University of Alberta. Our chapter is currently planning its first industrial mixer on March 2016, we believe that the interaction between the industrial and student bodies will bridge the gap between academia and industry and help foster growth of Alberta's emerging biotechnology sector. The expanded number and types of events should increase student interest and club enrolment.

### **Update from the Quebec Chapter**

Since June 2015, the Quebec City CBS Chapter (CBS-QCSC) organized two conferences and one large-scale symposium at Laval University. First, in June we welcomed Dr. Sophie Lerouge, from *l'École de Technologie Supérieure de Montréal* (member of CBS and the networks ThéCell and Pharmaquam) who gave a talk about her work as the Canadian Research Chair in endovascular implants and biomaterials. Later in September, Dr. Maurizio Vedani from the Politecnico di Milano in Italy came to give a talk about degradable metals and their use in medical devices. These two conferences were given at *Saint-François d'Assise* hospital in Quebec City. It was open to students in biology, materials sciences and chemistry, but also to clinicians. On October 30<sup>th</sup>, we held the very first one-day Symposium on Biomaterials at *l'Université Laval*. Five keynote speakers were invited, 4 coming from Canada: *École Polytechnique de Montréal*, Toronto University, McGill University; and one from France: *Centre Hospitalier Universitaire de Strasbourg*. The main topic of the symposium was the multi-scale interactions between cells and biomaterials. The symposium featured talks about surface functionalization, microtechnologies, cartilage repair, translational research, and also provided a workshop on commercializing scientific research. This event, which was free for all the attendees, was a success, with over 80 attendees, among which were professors, company representatives and students from several Canadian universities.

## Update from the British Columbia Chapter

The CBS BC Student Chapter hosted a summer BBQ and student welcome on both the UBC (May 25<sup>th</sup> 2015) and UVic (July 2<sup>nd</sup> 2015) campuses. The event attendance numbers were 55 and 30 people for UBC and UVic respectively. Of these numbers, we received more than 20 new subscribers to the CBS BC Student Chapter. On January 21<sup>st</sup> 2016, there will be a full-day seminar entitled: “*Biomaterials Technology: From the Lab to Industry*”. This event has been sponsored by STEMCELL Technologies and Instron, and will be focused on the step from academic research to technological development in the biomaterials industry.

## Update from the Montreal Chapter

The Montréal Student Chapter organized conferences at École Polytechnique de Montréal last July with invited professors Dr. Alexis Vallée-Bélisle and Dr. Matt Kinsella, who gave interesting speeches about different technologies on the molecular level and their applications in diagnosis. Approximately 50 people attended the event and they were invited to display their research on posters during a networking session after the conferences. On November 30<sup>th</sup>, the CBS student chapter of Montréal will organize an event to promote the CBS community and World Biomaterials Congress 2016 at McGill University. The different organization groups will be presented and the students will be given the opportunity to participate in these groups.

## Update from the Ottawa Chapter

The CBS Ottawa Student Chapter’s inaugural year was a resounding success. In line with our mandate, our chapter held multiple events involving both graduate students and professors from both the University of Ottawa and Carleton University in an effort to facilitate and strengthen awareness, networking and potential collaboration between institutions. At these events, we were pleased to have presenters from a variety of research backgrounds including Dr. Fabio Variola, Dr. Isabelle Catelas, Dr. Maria DeRosa and Dr. Emilio Alarcon. With our student chapter now being in its second year, our team is planning to hold a greater number of student-focused seminar presentations centered on the “*General Session Topics*” to be presented at WBC 2016. In addition, we are planning to hold a poster competition to provide students with exposure of their research as well as the added benefit of experience when presenting their work. We hope to see everyone at the WBC 2016 in Montreal on May 17<sup>th</sup> to 22<sup>nd</sup>!

## Renew your CBS Membership!

It’s that time of the year when you need to renew your membership. Keep in mind that memberships purchased now will be valid until the end of 2016, and active 2016 memberships are required to receive discounted CBS member pricing on WBC 2016 registration. The whole process can be completed online by following this link:

<http://www.biomaterials.ca/#!/membership/join>



### **CBS Newsletter editorial board**

Brian Amsden  
Isabelle Catelas  
Lauren Flynn  
Todd Hoare

Please contact [lauren.flynn@uwo.ca](mailto:lauren.flynn@uwo.ca) if you would like to contribute to our next newsletter.



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