



Weekly News

UBC School of Biomedical Engineering

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Announcements

SBME Symposium Updates

June 13 | 9:00 am - 5:30 pm

The Agenda for the SBME Symposium is finalized. [Download the Agenda](#) and see how you will be spending your day.

Research Talk Abstracts

Esteemed researchers Sara Roccabianca, Adrien Desjardins, and Gane Ka-Shu Wong will share groundbreaking work in biomechanics, biomedical imaging and sensing, and large-scale DNA/RNA sequencing. This year's Research Talks are sponsored by Kardium, a leading med tech company in BC, and promises to be an informative and inspiring day of learning.

Sara Roccabianca (Michigan State University)

Effect of Sex on the Mechanical Behavior of the Murine Urinary Bladder

Both sex and gender of an individual have an impact on their lower urinary tract anatomy, physiology, and function, in health and disease. Furthermore, these differences could influence disease progression and treatment, impacting patients' health and well-being. Yet, how these biological, societal, and cultural characteristics influence bladder biomechanics is still largely unknown. My group was the first to identify significant sex-differences in the three-dimensional mechanical behavior of the murine urinary bladder. We found that in healthy animals, males have significantly stiffer bladders when compared to females, especially in the range of luminal pressures associated with voiding. To collect these results and in collaboration with Dr. Tykocki (MSU, Pharmacology and Toxicology Department), we have also developed a novel mechanical testing tool and protocol that allows for 3D reconstruction of the murine bladder during pressurization test. Our work is pioneering the investigation in this space, strengthening the concerted effort from the scientific community as a whole to highlight the importance of including both biological sexes in all avenues of biomechanical research.

Adrien Desjardins (University College London)

Biomedical Imaging and Sensing with Optical Fibres

Accurately identifying tissue targets for diagnosis or therapy is of vital importance in minimally invasive surgical procedures. Advances in fibre optic sensing are transforming our ability to visualise anatomical structures and to sense physiological processes from within the body in real-time. With their small lateral dimensions and flexibility, optical fibres are ideally suited to integration within a wide range of medical devices. In this talk, I will present recent multidisciplinary developments including micro- and meso-scale imaging with optically generated and received ultrasound, intravascular pressure and flow sensing, and device tracking relative to external imaging systems. I will highlight how these modalities are well suited to robotic integration and can be

readily extended to applications outside of biomedical engineering, including marine science.

Gane Ka-Shu Wong (University of Alberta)

Drug Targets and Lead Compounds in the Era of Big Data for Humans and Biodiverse Taxa

What if scientists could create genetically-modified human beings to mimic the action of a putative drug for each of the ~20k human proteins? Although not every ailment would be treatable by drugs, for those that are treatable, we could quickly identify the appropriate drug target simply by analyzing the medical records from this population. Moreover, the likelihood of success in a subsequent clinical trial would be higher than if we had originally deduced that drug target from animals, cell lines, or computational models. I will argue that such a resource already exists, and no “CRISPR babies” were created. I will highlight the handful of FDA-approved drugs that were inspired by an earlier version of this paradigm, and show how the drug targets could have been identified with a day or two of work on this no-longer-mythical resource. Most of my examples are from cardiovascular diseases, the leading cause of death worldwide. But I will also explain how this paradigm is generalizable to other ailments, and especially to chronic diseases of aging.

However, drug targets are useless without lead compounds. There are technologies, e.g. antibodies, siRNA, that can generate a therapeutic option for almost any target, with the caveat that it would have to be injected. Longer term, an orally-delivered drug is preferable. I will discuss a little-known result from my sequencing of 1000+ biodiverse plant species. Plants have evolved an astonishing repertoire of cysteine-rich peptides (CRPs) that are thermally and enzymatically stabilized by disulfide bonds. It has been hypothesized that such peptides, not small molecules as widely assumed, may often be the active compounds in natural-products-based medicines. This idea has not been explored in detail, as it was until recently impossible to predict to any useful degree of accuracy what protein(s) a CRP might target. Breakthroughs in protein folding software have raised the prospect of creating a library of naturally-evolved CRPs with experimentally-validated human targets. As the Earth BioGenome Project delivers on its promise of genome sequences for all known plants and animals, the repertoire of human proteins that can be targeted will only grow with time.

Amgen Pitch Competition Reminder

Applications Close: May 22nd, 2023

Six Applicants Selected & Notified by: May 29th, 2023

Pitch & Award Ceremony at the SBME Symposium: June 13th, 2023

The Amgen pitch competition at the School of Biomedical Engineering is an event that aims to showcase and promote innovation in the field of biotechnology, life sciences and biomedical engineering. The purpose of the competition is to provide a platform for students and researchers to present their unique and innovative ideas for solutions or technologies that can address real-world problems in the field.

The competition is designed to encourage students to develop their skills in scientific research, problem-solving, and communication, as well as to foster collaboration and networking opportunities with industry professionals and academics. The competition aims to inspire and motivate the next generation of leaders in biomedical engineering and support the development of new ideas and technologies.

[Rules & Guidelines.](#)

[Apply.](#)

Professional Development Sessions & Research Talks

Creating Inclusive Spaces

May 16 | 12:00 pm - 1:30 pm

Inclusive learning and working spaces allow people to feel both physically welcomed and psychologically included. Our optimal environments celebrate the diverse experiences of our members and respond to a variety of cultural and personal needs. When we embrace the differences amongst us and actively seek to welcome and amplify the voices of those adversely affected by a lack of inclusion, we support culture change and create space for belonging.

[Register.](#)

Dialogue Day: Building your Anti-Racist Toolbox

May 17 | 10:00 am - 2:30 pm

The Dialogue Day is a response to our community's desire to develop our collective toolboxes for having critical and challenging conversations around race, gender and anti-oppression, as well as building caring and equitable spaces within our Faculties as it relates to anti-oppression in leadership, research, teaching, and the workplace.

[Learn More or Register.](#)

Transformation, Inspiration and Guidance: Celebrating 20 Years of Indigenous Excellence in Medicine

May 17 | 12:00 pm - 1:30 pm

James Andrew has been a source of inspiration and guidance in helping to create and transform the UBC Faculty of Medicine's Indigenous MD Admissions Pathway. In 2022, the Faculty of Medicine community celebrated 20 years of the Pathway as well as the Indigenous Family Medicine Residency Program, and over this time period more than 120 Indigenous doctors have graduated and are now serving communities across the province as family doctors, surgeons, pediatricians and more.

[Register.](#)

Disrupting the Status Quo: Intersecting Inequities Impacting Women in the Faculty of Medicine and Opportunities for Change

June 7 | 9:30 am - 1:30 pm

During this virtual event, hear from a diverse group of women about their perspectives on leadership, opportunities and barriers in the context of health professions practice, education and research. We will centre intersectionality and the differentiated experiences of women as we critically examine how current academic systems and hierarchies create additional barriers for women and ideas for change.

[Register.](#)

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THE SBME COMMUNICATIONS TEAM