TEAM Hub
Tissue Engineering & Applied Materials

1st Tissue Engineering and Applied Materials (TEAM) Hub Workshop

Accelerating translation of *in vitro* tissue models to therapeutics for age-associated and chronic diseases

June 26-28, 2023

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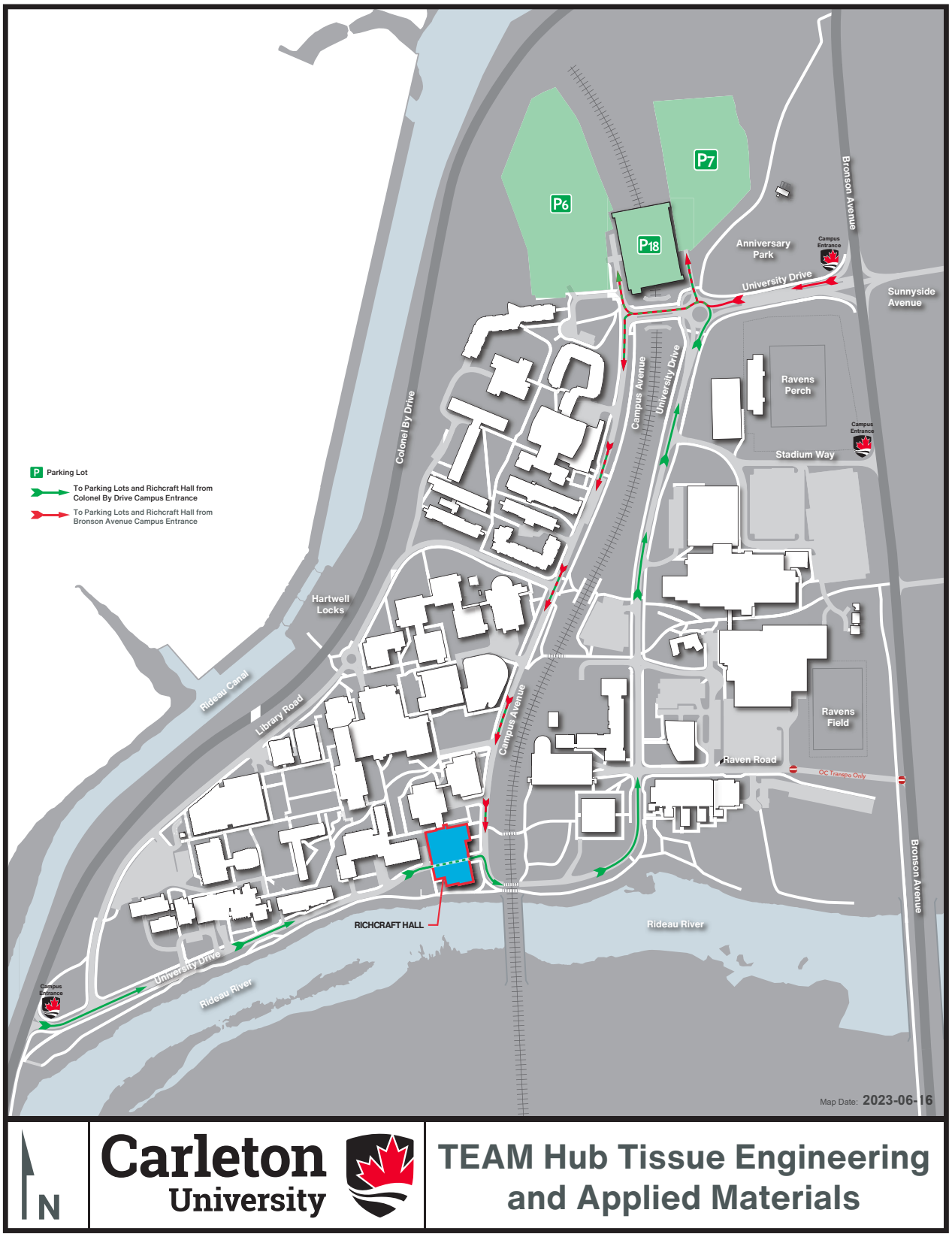

Organizing Committee

- **Andrew Harris,** Department of Mechanical and Aerospace Engineering, Carleton University
- **Edana Cassol**, Department of Health Sciences, Carleton University
- **Leila Mostaço-Guidolin**, Department of Systems and Computer Engineering, Carleton University
- **William Willmore**, Departments of Biology and Chemistry, Institute of Biochemistry, Carleton University

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Session Chairs

- **Andrew Harris**, Department of Mechanical and Aerospace Engineering, Carleton University
- **Anna Jezierski**, National Research Council of Canada, Human Health Therapeutics Research Centre
- **Edana Cassol**, Department of Health Sciences, Carleton University
- **Jeff Smith**, Department of Chemistry, Carleton University
- **Jeff Smirle**, Faculty of Sciences, Carleton University
- **Jonah Marek**, Saint Vincent Hospital and Bruyere Research Institute
- **Joerg Overhage**, Department of Health Sciences, Carleton University
- **Leila Mostaço-Guidolin,** Department of Systems and Computer Engineering, Carleton University
- **Menno Oudhoff**, Department of Health Sciences, Carleton University
- **Sangeeta Murugkar**, Department of Physics, Carleton University
- **William Willmore**, Departments of Biology and Chemistry, Institute of Biochemistry, Carleton University

Welcoming Message

On behalf of the Tissue Engineering and Applied Materials (TEAM) Hub, we welcome you to our 1st Workshop.

The workshop aims to strengthen the connections between theory and the application of 3D tissue models, biomaterials and optical imaging and to build stronger ties between university research, government, industry and clinical needs.

We are pleased to have leading researchers share the outcomes of their work and exhibitors from industry present their products and services. We are also delighted to be joined by students who have chosen multidisciplinary research as their career path. We invite you to seize the opportunity to develop your network with the biomedical, tissue engineering, imaging and clinical research community and industry.

Finally, we wish to convey our gratitude to the speakers, partners, collaborators, supporters, session chairs and volunteers. Without you the workshop would not be possible.

Enjoy the workshop and we hope to see you again in 2025!

Warm Regards,

Edana Cassol & Leila Mostaço-Guidolin
TEAM Hub co-directors

General Information

Venue

Richcraft Hall - 2nd Floor
Carleton University
Ottawa, ON

Name Badge

Please wear your name badge at all times. This will ensure your access to the conference room and Exhibition Hall.

Parking

We recommend parking at P2, P6, P7, P16, or P18. Please follow the signs when entering the campus. All parking is paid, however you can use a special discount code for the event: TEAM23.
For more information, please visit: https://carleton.ca/parking/visitors/

Security & Safety

Please do not leave bags and luggage unattended at any time, whether inside or outside session rooms.

Registration

All participants should register at registration desk. The registration desk is located on the 2nd floor, by the escalators. A badge with your name will be available.

Disclaimer

The TEAM Hub secretariat and organizers cannot assume liability for personal accidents, loss of or damage to private property of participants, and accompagnying persons, either during or directly arising from the TEAM Hub Workshop. Participants should make their own arrangement with respect to health and travel insurance.

Special Events

Keynote Lecture

Join us **June 26th, 6-7:30 PM** at Richcraft Hall Theatre (room #2200), to listen to **Dr. William Stanford**. He is going to talk about "**Stem Cell Based-Tissue Engineering for Disease ModeLling and Therapeutic Development**". Dr. Stanford is a senior scientist in the Regenerative Medicine Program at The Ottawa Hospital, which includes the Sprott Centre for Stem Cell Research and the Sinclair Centre for Regenerative Medicine. He is also a professor in the Department of Cellular and Molecular Medicine at the University of Ottawa and holds a Canada Research Chair in Integrative Stem Cell Biology and Functional Genomics.

Social Event & Networking

Get to know the TEAM Hub members and speakers. We will have an **informal social** gathering at the Métropolitan Brasserie & French Restaurant (700 Sussex Dr.), on **June 26th** after the keynote lecture (**7:30-9:30 PM).** Registration is required.

Lab Tours & Demo

Interested in visiting the TEAM Hub labs? We will have informal tours on **June 27th, 5-6 PM.** There will be a **special talk** by Zeiss about the latest imaging technology and a quick demo of our state-of-the-art LSM 980 with Airyscan 2 and multiphoton capability!

Trainees Poster Competition & Networking

Don't miss the chance to see the great research carried out by talented trainees and connect with professionals from different areas and sectors. We will have a cash bar and light food will be served on **June 27th** after the lab tours and demo (**6-8 PM**).

Our Sponsors and Supporters

This workshop was made possible by the generous contributions of our sponsors and partners. Without their financial support, events like this one would not be possible.

Our big THANK YOU!

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08:00-09:00	Breakfast & Registration

Session 1: Meet the TEAM Hub

09:00-09:20	Hello World! - Introducing the Tissue Engineering & Applied Materials (TEAM) Hub Join us to the official launch of the TEAM Hub. Dr. Mostaço-Guidolin will provide an overview of the vision and mission of the group and how we aim to contribute to strengthening the local research community and expand collaborations in the areas of tissue engineering, microscopy, biomaterials and biomedical and clinical research.
09:20-10:45	Dr. Andrew Harris, Dr. Edana Cassol, Dr. Jeffrey Smith, Dr. Joerg Overhage, Dr. Leila Mostaço-Guidolin, Dr. Menno Oudhoff, Dr. Sangeeta Murugkar, Dr. William Willmore, Carleton University *Unveiling Our Research: A Closer Look at Our Team's Areas of Expertise* Meet all the TEAM Hub core members based at Carleton University. Each member will provide a brief overview of their research areas. An overview of some projects linked to the TEAM Hub and their individual interested will be highlighted.
10:45-11:00	Coffee Break & Networking

Day 1 - June 26th

Session 2: Tissue Remodelling in Aging and Disease

Clinical Challenges I - Tissue remodeling and fibrosis in cancer [Chair: Dr. Menno Ourdhoff]

11:00-11:45 Dr. Barbara Vanderhyden, Ottawa Hospital Research Institute, University of Ottawa

The Aging Ovary and Ovarian Cancer Risk

11:45-12:30 Dr. Dominique Trudel, Université de Montréal

Intraductal Carcinoma of the Prostate: Detection and Modeling

Intraductal carcinoma of the prostate (IDC) is an aggressive variant of prostate cancer. Identified in 20% of men with prostate cancer, IDC is recognized as prostate cancer growing into prexisting benign ducts. Despite clear associations with prognosis, very few biomarkers allow to confirm the presence of IDC in men. Existing biomarkers such as ERG overexpression and PTEN loss as detected by immunohistochemistry are positive in 60-75% of cases but are not useful when negative. Using a hand-held Raman spectroscopy probe, we could detect prostate cancer with sensitivity and specificity >80% by analysing how photons interact with molecular bonds in the prostate tissue. Following these results, we developed a Raman microscopy method that is compatible with the histopathology clinical workflow, and we will discover through this talk how Raman spectroscopy can be used to detect IDC, among others. Furthermore, we will provide a quick insight on IDC modeling.

12:30-13:30 Lunch

Clinical Challenges II - Chronic wounds and joint infections [Chair: Dr. Edana Cassol]

13:30-14:00 Dr. Katrina DeZeeuw, Saint Vincent Hospital and Bruyere Research Institute

Clinical Approach to Wound Care – Approach, Clinical Decision Making, and Priority Unmet Needs

14:00-14:30 Dr. Marisa Azad, Ottawa Hospital Research Institute

Chronic Periprosthetic Joint Infection

14:30-14:45 Coffee Break & Networking

Session 2: Tissue Remodelling in Aging and Disease

Clinical Challenges III - Fibrosis and Inflammation in chronic respiratory diseases
[Chair: Dr. Leila Mostaço-Guidolin]

14:45-15:30 Dr. Tillie Hackett, Centre for Heart Lung Innovation, University of British Columbia

Understanding the Heterogeneity of Lung Inflammation and Fibrosis in Chronic Respiratory Diseases Using Spatial Imaging

15:30-16:15 Dr. Jeremy Hirota, McMaster University

Embracing Complexity Over Simplicity in Lung Model Development

The lung is a dynamic, stretchable, 3D organ that exchanges over 10,000 liters of air each day, yet the traditional and most common approach for studying lung cell biology is in static 2D on hard plastic. Important biological processes involved in lung disease development have been revealed within 3D models under mechanical strain that are not present in static 2D systems. We therefore must embrace some elements of complexity in experimental design if we are to progress our understanding of biological mechanisms that regulate lung health and disease. This talk will summarize the journey the Tissue Engineering for Advanced Medicine (TEAM) Lab are taking towards building new lung models with the ultimate vision of the group being that these approaches will help regenerate or replace dysfunctional lungs.

Keynote Lecture

[Chair: Dr. William Willmore]

18:00-19:00 Keynote Lecture - Dr. William Stanford, Ottawa Hospital Research Institute, University of Ottawa

Stem Cell Based-Tissue Engineering for Disease Modeling and Therapeutic Development

Approximately 7000 rare diseases have been described, which together affect approximately 10 % of the population. However, 95% of these diseases lack a single FDA/Health Canada-approved treatment. Rare diseases often activate common disease pathophysiological pathways; hence, understanding rare disease etiology and pathophysiology provides critical insight into common disease mechanisms and therapeutic discovery. However, modeling rare diseases can be challenging due to the limited availability of patient samples. Human pluripotent stem cells (PSCs), including embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs), are non-transformed human cell lines that can be grown undifferentiated indefinitely and have the capacity to differentiate into essentially all human cell types. These capacities, along with the ability to genetically modify hPSCs, make them excellent sources to study basic and translational questions in cell biology, development, and disease, while serving as a resource for engineering human tissues for drug testing and regenerative medicine and oncology applications. The recent advances is PSC-derived tissue organoid differentiation, biomaterials, and xenograft technologies, human PSCs provide exceptional opportunities to model disease in a tissue mimetic-fashion, developing models more likely to translate clinically. I will discuss our efforts to model and perform therapeutic development for several diseases hPSC-based tissue engineering, drug screening, gene and disease regulatory network analyses.

19:30-21:00 Social Event & Networking

After the keynote lecture, we invite all participants to join us at the Métropolitan Brasserie & French Restaurant (700 Sussex Dr.) for food and drinks (not covered by the workshop organizers). This is a great opportunity to expand your network and meet members of our vibrant research community.

Session 3: Understanding Tissue Microenvironments

Capturing the biochemical properties of tissue microenvironments [Chair: Dr. William Willmore]

09:10-09:50 Dr. Robert Ben, University of Ottawa
Small Molecule Ice Recrystallization Inhibitors: Development, Mechanism of Action and Applications

09:50-10:30 Dr. Jeremy Van Raamsdonk, McGill University
Insights into the Molecular Mechanisms of Aging: Lessons from C. elegans

C. elegans is a genetic model organisms that has been used extensively to understand the biology and genetics of aging. To gain insight into the molecular mechanisms contributing to lifespan extension, we have examined gene expression changes in long-lived mitochondrial mutants using RNA-sequencing as an unbiased approach. Our results indicate that multiple pathways of cellular resilience are activated in the long-lived mitochondrial mutants and contribute to their longevity. These pathways include the DAF-16 mediated stress response, the mitochondrial unfolded protein response, the p38-mediated innate immune signaling pathway and the mitochondrial thioredoxin system. Overall, our research demonstrates that small amounts of oxidative stress can increase lifespan and resistance to stress through the activation of stress response pathways.

10:30-10:45 Coffee Break & Networking

Day 2 - June 27th

Session 3: Understanding Tissue Microenvironments

Biomechanics of cells and tissues & biomaterials properties
[Chair: Dr. Andrew Harris]

10:45-11:15 Dr. Andrew Speirs, Carleton University

Challenges in Cartilage Tissue Engineering

Articular cartilage is well-adapted to providing almost friction-free motion under typical joint loads of two to three times body weight. This is accomplished through load sharing between the solid and fluid phases of the biphasic tissue. Maintaining high fluid pressurization is critical to low friction interfaces of articular joints, as well as reducing the wear-and-tear on the tissue that can lead to osteoarthritis. Furthermore, cartilage is avascular, so chondrocytes rely on molecular diffusion through the tissue for nutrient supply and biochemical signaling. This talk will review cartilage biomechanics and highlight recent advances as well as challenges in creating durable engineered scaffolds that reproduce the behaviours of the natural tissue.

11:15-11:45 Dr. Allen Ehrlicher, McGill University

Mechanoregulation of YAP by Nuclear Deformation in Stem Cell Differentiation

Controlling mesenchymal stem cells (MSCs) differentiation remains a critical challenge in their therapeutic application. Numerous biophysical and mechanical stimuli influence stem cell fate, however, their relative efficacy and specificity in mechanically directed differentiation remain unclear. Yes-associated protein (YAP) is one key mechanosensitive protein that controls MSC differentiation. Previous studies have related nuclear mechanics with YAP activity, but we still lack an understanding of what nuclear deformation specifically regulates YAP, and its relationship with mechanical stimuli. In this talk I'll discuss how maximum nuclear curvature is the most precise biophysical determinant for YAP mechanotransduction mediated MSC differentiation, and is a relevant standard for stem cell-based therapies. I will share some of our traction force microscopy and confocal microscopy studies that have characterized the causal relationships between contractility and nuclear deformation in regulating YAP activity, and how this translates to differentiation in MSCs using micropatterned substrates.

11:45-13:00 Lunch

Session 4: *In vitro* 3D Tissue Models
[Chair: Dr. Anna Jezierski]

13:00-13:30 Dr. Matt Kinsella, McGill University

Developing Mechanically Tunable Extracellular Matrix Hydrogels to Evaluate the Biophysical Properties of Immune Cell Therapy in Solid Tumors

13:30-14:00 Dr. Adrian West, University of Manitoba

Development of a 3D Bioprinted Airway Smooth Muscle Model For Manipulating Structure And Measuring Contraction

14:00-14:30 Dr. Milica Radisic, University of Toronto

In vitro Models of Vascularized Cardiac Muscle for Disease Modelling

Vascularization is critical for the survival of engineered tissues in vitro and in vivo. In vivo, angiogenesis involves endothelial cell proliferation and sprouting followed by connection of extended cellular processes and subsequent lumen propagation through vacuole fusion. This presentation will first cover the requirements for functional vascularization of tissue engineered constructs and hearts-on-a-chip, followed by overview of recent approaches to achieve this goal. We will first describe an approach that mimicked the angiogenesis process in engineering an organized capillary network anchored by an artery and a vein. The network was generated by inducing directed capillary sprouting from vascular explants on micropatterned substrates containing thymosin β4-hydrogel. The capillary outgrowths connected between the parent explants by day 21, a process that was accelerated to 14 d by application of soluble VEGF and hepatocyte growth factor. We will then move to microfabrication approaches, through a fabrication of a microfluidic scaffold (hereafter referred to as AngioChip) that supports the assembly of parenchymal cells on a mechanically tunable matrix surrounding a perfusable, branched, three-dimensional microchannel network coated with endothelial cells. The design of AngioChip decouples the material choices for the engineered vessel network and for cell seeding in the parenchyma, enabling extensive remodelling while maintaining an open-vessel lumen. The incorporation of nanopores and micro-holes in the vessel walls enhances permeability, and permits intercellular crosstalk and extravasation of monocytes and endothelial cells on biomolecular stimulation. We will also show that vascularized hepatic tissues and cardiac tissues engineered by using AngioChips process clinically relevant drugs delivered through the vasculature, and that millimetre-thick cardiac tissues can be engineered in a scalable manner. Moreover, we demonstrate that AngioChip cardiac tissues implanted with direct surgical anastomosis to the femoral vessels of rat hindlimbs establish immediate blood perfusion. Finally, a model of SARS-CoV-2 induced myocarditis will be presented based on the vascularized cardiac muscle.

14:30-14:45 Coffee Break & Networking

Session 5: Microbology and Chronic Diseases [Chair: Dr.Joerg Overhage]

14:45-15:55 Dr. Peter Lasch, Robert Koch Institute

Confocal Raman Spectroscopy in Microbiology

16:00-17:00 Dr. Robert E.W. Hancock, University of British Columbia

New Strategies to Treat Recalcitrant Biofilm Infections

Biofilms represent two thirds of all hospital infections and 80% of chronic infections. They are very difficult to treat due to their multi-drug adaptive resistance to antibiotics and the fact that no agent has been introduced into human medicine to specifically address biofilm infections. We have defined a class of peptides that act against biofilms formed by multiple species of bacteria in a manner that is independent of activity vs. planktonic bacteria. These synthetic anti-biofilm peptides that (i) kill multiple species of bacteria in biofilms, including the most fearsome antibiotic resistant pathogens in our society (collectively termed ESKAPE pathogens), (ii) work synergistically with antibiotics against multiple bacterial species and in model infections, and (iii) are effective in animal and human organoid models of high density biofilm and abscess infections. They can also address the inflammatory sequelae of chronic infections, in that they can suppress potentially harmful inflammation/sepsis while boosting protective innate immunity. The anti-inflammatory activity works against sterile and infectious inflammation in animal models and is as effective as NSAIDs. I will discuss a path to development of these agents as human therapeutics.

17:00-18:00 Optional Tour of TEAM Hub labs & Zeiss LSM 980 Demo

Dr. Ian Bates from Zeiss will present a brief overview of one of the latest imaging technologies: the LSM 980 with Airyscan 2. Dr. Bates will provide a demo at the TEAM Hub BioImaging Lab, located in Canal Building, room #5111.

18:00-20:00 Trainees Poster Competition & Networking

This is your chance to interact with some excellent trainees from the TEAM Hub and other local research labs. There will be food and a cash bar. Enjoy this time to network in a relaxed environment while visiting the research and knowledge translation posters. Winners of the competition will be announced by the end of the workshop.

Session 6: Optical Imaging & Tissue Remodelling Visualization [Chair: Dr. Sangeeta Murugkar]

09:10-10:00 Dr. Adam Shuhendler, University of Ottawa

Molecular Imaging of the Brain, Kidney, and Heart

Our experience with evidence-based medicine at the molecular level has taught us that earlier diagnosis often leads to better patient outcomes, and that the more rigorously we can define the pathology of the individual patient, the better we can match each patient to the most effective course of treatment. In this era of precision medicine, some of this "precision" derives from the non-invasive mapping of pathological biochemistry with probes targeted to biomarkers of interest, also known as molecular imaging. Our lab has been focused on applying the concept of Activity-based Sensing to the generation of imaging agents for clinical imaging modalities. Our chemical tools harness dynamic reactivity to access biochemical activity with enhanced signal-to-noise, affording us the ability to dredge the weeds for subtle indications of pathology. This talk will describe the tools we have developed to make aldehydic load (the total complement of tissue aldehydes) an accessible biomarker for concussion mapping by MRI, to map kidney function without heavy metals by MRI, and to usher optical coherence tomography into the molecular age. The chemical design strategy and the demonstration of the imaging agents in animal models of disease will be outlined for each of these chemical tool classes. Ultimately, our goal is to continue to develop these probe technologies to realize the clinical diagnostic potential of activity-based sensing, and advance our capabilities to personalize medicine.

10:00-10:45 Dr. Daniel Coutu, Ottawa Hospital Research Institute, U. of Ottawa

Identification and Characterization of Novel Skeletal Stem Cell Populations in Mice and Humans

Skeletal tissues possess an amazing capacity to regenerate. However, this regenerative capacity decreases with age and comorbidities. In older individuals, skeletal tissues heal slowly and imperfectly despite advances in orthopedic surgery and rehabilitation. Current experimental approaches involve tissue engineering and stem cell-based regenerative therapies. Indeed, stem cells are responsible for growth, maintenance, and repair of skeletal tissues. However, they remain poorly characterized at the cellular and molecular levels which is a clear limitation for their clinical use. Our aim was to identify and characterize novel skeletal stem cell populations in murine and human tissues. To achieve this, we used genetic lineage tracing, spectral 3D confocal imaging, computational image analysis, single cell transcriptomics and in vitro assays on mouse and human tissues. We show that the adult mouse skeleton contains self-renewing, multipotent skeletal stem cells (SSCs) with osteogenic, chondrogenic and adipogenic potential. These bona fide SSCs express Sox9 and are located in the resting zone of the growth plates and in periosteum. We further show that they persist after epiphyseal fusion in mature and old animals. Transcriptome analysis revealed that these cells express other putative SSCs markers, as well as genes involved in skeletal development, stem cell self-renewal, and fate decision. This data provides testable drug targets to pharmacologically manipulate SSCs fate decisions in situ. We showed that human tissues contain SSCs akin to murine tissues. This is the first experimental proof of self-renewal in postnatal SSCs in vivo. These findings provide actionable insights for the use of culture-expanded stem cell product for regenerative medicine product or pharmacological targeting of these stem cells in situ.

10:45-11:00 Coffee Break & Networking

Session 7: Clinical Applications of Biomaterials and Imaging [Chair: Dr. Leila Mostaço-Guidolin]

11:00-11:45 Dr. Emilio Alarcón, University of Ottawa Heart Institute

Peptide-based Materials for Cardiac Repair

In Canada, an adult is diagnosed with heart disease every five minutes and cardiovascular disease remains the second most common cause of death, with myocardial infarction (MI) due to coronary blood flow blockage leading the number of annual deaths. The last few decades have seen remarkable advances in surgical procedures and technologies to restore blood flow after MI. However, those procedures fall short at restoring heart function; 1 out of 10 cases will progress to advanced heart failure, a condition with 5-year mortality of ~50%. Due to the limited endogenous ability of the cardiac tissue to heal and the complexity of the heart extracellular matrix (ECM), repair and regeneration of the cardiac muscle are limited. In the pursuit of materials able to improve cell adhesion, viability, proliferation, and ultimately heart function, there have been many reports on the preparation of biomimetic materials with biochemical and mechanical properties similar to that of native healthy tissues. Yet, therapeutic materials for cardiac repair have been unable to simultaneously address: (1) restoring electroconductivity within the cardiac muscle, key for heart function, without detrimentally affecting heart contractility or electrical signal propagation and, (2) the availability of therapeutic materials that, while effective in pre-clinical models, are also realistically translatable without limitations regarding their source of origin or manufacturing under GMP standards, as is the case when using animal or plant derived proteins. In this talk, we will present some recent advancements our group have made in the pursuit to develop peptide-based materials for heart repair.

11:45-12:30 Dr. May Griffith, Université de Montréal

Bench-to-Bedside: Merging Basic Research with Clinical Translation

Many regenerative medicine technologies have now entered the clinical realm with the help of biomaterials. Biomaterials, in conjunction with stem cells, are used to engineer tissues for in vivo testing platforms (organs-on-chips) or clinical use. However, biomaterials can also be used to stimulate in situ tissue regeneration to avoid adverse immune reactions. In ophthalmology, human donor corneas have served well for corneal transplant surgery. Still, the massive shortage of suitable donor tissue combined with the expense and technical challenges of eye banking leaves a substantial proportion of the world's population without access to treatment. Here, we discuss the development of novel biomaterials for corneal implants that stimulate in situ tissue regeneration and the pathway to getting these into clinical trials. The results of clinical and pre-clinical trials will be discussed.

12:30-13:00 Lunch

Session 8: Mapping the Path Forward

13:00-14:30	**Panel Discussion 1 – Building government and industry partnerships [Chair: Dr. Jeff Smirle]** Marie Hogan, Senior Business Development Advisor, MITACS Stacey Nunes, Team Lead, Business Management, Human Health Therapeutics, National Research Council (NRC) Dr. Theresa White, Manager, Innovation Transfer, Contracts and Agreements, Carleton University Dr. Jagdeep K. Sandhu, Senior Research Officer, Human Health Therapeutics Research Centre In this session, panelists will discuss how to approach and develop partnerships with industry and government-based organizations and how to maintain these partnerships long term. It will also discuss funding and trainee opportunities within these sectors.
14:30-14:45	Coffee Break & Networking
14:45-16:00	**Panel Discussion 2 – Connecting research to innovation to find solutions for aging individuals [Chair: Dr.Jonah Marek]** Dr. Kumanan Wilson, Chief Executive Officer/Chief Scientific Officer, Bruyère Research Institute, Vice President Research & Academic, Bruyère Continuing Care and Chief Scientific Officer of CANImmunize Inc. Dr. Frank Knoefel, Associate Professor, University of Ottawa, Physician, Bruyère Memory Program, Senior Investigator, Bruyère Research Institute In this session, panelists will discuss how to connect research to innovation in clinical settings and how to identify research areas that will have the most meaningful impacts. It will also discuss how we can engage aging populations as partners and what is required to build long term partnerships between hospitals and academic research institutions.
16:00-16:30	Wrap up and Posters Awards Ceremony

Life Sciences [LS], Technology and Applications [TA], and Knowledge Translation [KT]

1 TA **Harnessing 3D bioprinting to strengthen cancer stem cell-targeting drug discovery**
Veronika Yevdokimova, Christopher J. Bergin, Amanda M. da Silva, Jacob L. Billingsley, and Yannick D. Benoit - University of Ottawa

2 LS KT **Monocyte infiltration and hybrid subpopulation of tumour-associated macrophages drive early vaccinia-mediated B16-F12 tumour reduction**
D. Ahmed, R. Skillings, O. Abdo, A. Fareghdeli, Z. Versey, L. Mostaço-Guidolin, E. Cassol - Carleton University

3 LS KT **Unveiling the complexity of tumour-associated macrophages: insights from *in vitro* and *in vivo* models**
Skillings R, Ahmed D, Boxma A, Abdo O, Fareghdeli A, Versey Z, Mejlaoui R, Sheridan M-E, Al Daraawi M, Guidolin L, Cassol E - Carleton University

4 LS KT **Developing 3D tumor model using bioprinting technology for evaluating the effect oncolytic virus (OV) therapy on tumour associated macrophages (TAMs)**
A. Fareghdeli, R. Skilling, D. Ahmed, Z. Versey, E. Cassol and L. Mostaço-Guidolin - Carleton University

5 LS **Effect of BRCA Mutation and Metformin use on Premature Ovarian Aging**
A. Murray, D. Landry, C.W. McCloskey, D. Trudel, A.M. Mes-Masson, R. Drapkin and B.C. Vanderhyden - University of Ottawa

6 LS **Investigating the Relationship between BRCA Mutations and Ovarian Cancer**
O.R. Piccolo, H.T. Vaishnav and B.C. Vanderhyden - University of Ottawa

7 TA **Stimulated Raman scattering microscopy to investigate radiation stress response in MCF7 cancer cells**
C.H. Allen, **J.R. Gagnon,** R. Skillings, D. Ahmed, S.C. Sanchez, K. Altwasser, G. Hilan, W.G. Willmore, V. Chauhan, E. Cassol, and S. Murugkar - Carleton University

8 TA **Towards the development of Raman Spectroscopy for blood-based biodosimetry**
A. Beausoleil-Morrison, **C. McNairn**, X. Qin, C. Ciobanu, K. Altwasser, S. Subedi, V. Chauhan and S. Murugkar - Carleton University

9 TA **[Abstract confidential]**
K. Tran, S. Steinberg, Y. Ono and S. Rajan - Carleton University

10, 11 LS KT **Development of in vitro airway models for asthma**
N. Abzan W. Willmore, L. Mostaco-Guidolin - Carleton University

Life Sciences [LS], Technology and Applications [TA], and Knowledge Translation [KT] [cont.]

12, 13 TA KT **Mapping Airway Remodeling in Asthma using Multimodal Raman-Second Harmonic Generation Imaging and Machine Learning**
N.N. Kunchur, R.A. Shaw, T.L. Hackett, L. Mostaco-Guidolin - Carleton University

14, 15 TA KT **Evaluation of the effect of sample preparation in collagen fibres via Second Harmonic Generation Imaging**
A. Kaianathbhatta, D. Ahmed, R. Skillings, Z. Versey, E. Cassol, L. Mostaço-Guidolin - Carleton University

16 TA **Mathematical models for mapping cellular dynamics on bioengineered in extracellular matrix**
Contesini, G.S., L.Mostaço-Guidolin - Carleton University

17, 18 LS KT **The Microbiota of Pressure Injuries: Bacterial Dynamics and Antibiotic Tolerance in Polymicrobial Biofilm Infections**
Allison K, Beaulieu C, Mejlaoui R, DeZeeuw K.G, Marek J.E, Latorre M, Mostaço-Guidolin, Cassol E, Overhage J - Carleton University

19 LS KT **Understanding the effects of Pseudomonas aeruginosa biofilms on macrophage metabolism and function to improve wound care**
Mejlaoui R, Z. Versey, K. Allison, C. Beaulieu, C. Lamourie, D. Ahmed, O.Abdo, K. deZeeuw, J. Marek, J. Overhage and E. Cassol - Carleton University

20 LS **Elucidating the role of Schwann cell development in mesenchymal Tuberous Sclerosis Complex**
Wiljer E., J. Yockell-Lelievre, W. Batoff, A. Pietrobon, William Stanford - University of Ottawa

21 LS **An investigation into impact and strain-linked changes to the synapses in *ex vivo* porcine brain tissues**
Kang G. , Hannah Thomson, Brendan Hoffe, Rohan Banton, Thuvan Piehler, Matthew Holahan, Oren E. Petel - Carleton University

22, 23 TA KT **An in vitro model of articular cartilage incorporating a calcified zone**
Mulholland M.S., M. Pickell, S. Carsen, F. Variola and J.-P. St-Pierre - University of Ottawa

24, 25 TA KT **Development of Inorganic Polyphosphate-Based Nanoparticles for Drug Delivery into Articular Cartilage**
Nhan J., Nicolas Strebel, Khushnouma Virah Sawmy, Jordan Yin and Jean-Philippe St-Pierre - University of Ottawa

26 TA **[Abstract confidential]**
S. Steinberg, Y. Ono and S. Rajan - Carleton University

Life Sciences [LS], Technology and Applications [TA], and Knowledge Translation [KT] [cont.]

27, 28 TA KT **Detection of Radar-based Human Fall Events as Anomalies**

Dey A., Sreeraman Rajan, Gaozhi Xiao and Jianping Lu - Carleton University

29 TA **Elucidating the Lipidomic Dynamics of Lentiviral Production and Infection**

Roberts J.A., Elena Godbout, Christopher Boddy, Jean-Simon Diallo, Jeffrey C Smith - Carleton University

30 TA **Investigating Cellular Response to Mechanical Stretch Through Proximity Labeling Experiments**

S. Desroches, D. Delgado, G. Kang, & A. Harris - Carleton University

31 LS **Inside-Out: Understanding aberrant expression of intracellular proteins at the cell surface during hypoxia**

A.T. Star, A.S. Haqqani and W.G. Willmore - Carleton University

We hope to see you in 2025 for the

2nd TEAM Hub Workshop!