PROGRAMME

TUESDAY, SEPTEMBER 24th, 2024

Café Scientifique bringing together members of the public and Canadian and International researchers on bone marrow adiposity (funded by the CIHR-Institute of Aging)

"How Fat Kills Your Bones?"

17:00-18:00 – YMCA Montreal Centre Ville
*(organized in collaboration with **Schouela CEDurable Centre of Excellence – www.cedurable.ca**)*

WEDNESDAY, SEPTEMBER 25th, 2024

TIME	SESSION	DETAILS
08:00 - 09:00	**WORKING GROUP MEETINGS**	• **WG3. Biobanking** • **WG5. Applications of Clinical and Translational Research** • **WG.6 Early Career Investigators (Next Generation BMAS)**
***TOPIC**: Bone Marrow Adiposity with and without gravity* ***Chairs**: Danielle Whittier & Tânia Amorim*		
09:00 - 09:30	**INVITED LECTURE 1**	**Is BMAT ready for space exploration?** *Speaker: **Guy Trudel*** *Ottawa Hospital Research Institute, Ottawa, Ontario, Canada*
09:30 - 10:00	**INVITED LECTURE 2**	**Bone Marrow Mechanosensitivity** *Speaker: **Glen Niebur*** *University of Notre Dame, Notre Dame, Indiana, USA*
10:00 - 10:45	**Plenary Session 1:**	**10:00-10:15 - Abstract 1: Nathalie Bock**, Queensland University of Technology, Brisbane, Queensland, Australia *"ECM-derived hydrogel models of adipose tissue provide new insights on the prostate cancer/adipocyte crosstalk in bone and response to antiandrogen therapy"* **10:15-10:30 - Abstract 2: Julien Paccou**, Lille University Hospital, Lille, France *"Bone Marrow Adiposity Alterations in Postmenopausal Women with Type 2 Diabetes Are Site-Specific and Not Mediated by Recent Fragility Fractures"* **10:30-10:45 - Abstract 3: Beatriz Gamez**, University of Oxford, University of Oxford, United Kingdom *"High cholesterol diet increases resistin in bone marrow plasma and increases myeloma tumour burden in vivo and Bortezomib resistance ex vivo"*
10:45 - 11:05	**Coffee Break – OPEN POSTER SESSION**	

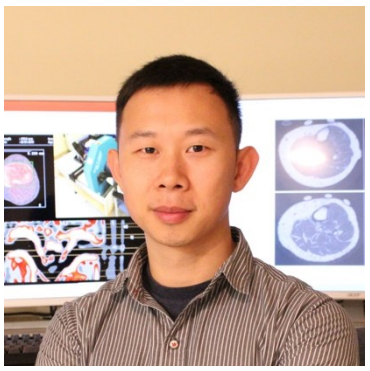
	TOPIC: Bone marrow fat and aging ***Chairs***: *Gustavo Duque & Maxime Bedez*	
11:05 - 11:35	**INVITED LECTURE 3**	**Senescence of Bone Marrow Adipocytes** *Speaker:* ***Mei Wan*** *The Johns Hopkins University School of Medicine, Baltimore, Maryland, USA*
11:35 - 13:30	**Plenary Session 2**	**11:35-11:50 Introduction to the International Federation of Musculoskeletal Research Societies, IFMRS** *Speaker:* ***Federico Moscogiuri****, CEO, IFMRS* **11:50-12:05 - Abstract 4: Michaela Reagan**, Maine Medical Center Research Institute, Scarborough, ME, USA *"Bone Marrow Adipocytes Affect Myeloma Cell Metabolism"* **12:05-12:20 - Abstract 5: Agathe Bessot**, Queensland University of Technology, Brisbane, Queensland, Australia *"Deciphering the role of bone marrow adipocytes on prostate cancer bone tumor progression and therapy resistance using 3D in vitro and humanized in vivo platforms"* **12:20-12:35 - Abstract 6: Helene Rougé-Labriet**, MABLab - Marrow Adiposity & Bone Lab, Lille University, Lille, France *"Unlocking Insights into Bone Marrow Adipose Tissue using X-ray Phase Contrast Imaging: A Comparative Study"* **12:35-12:50 - Abstract 7: Martina Dzubanova**, Institute of Physiology of the Czech Academy of Sciences, Prague, Czech Republic *"NADPH Oxidase 4 (NOX4) deletion differently affects the size of bone marrow adipocytes (BMADs) in males and females"* **12:50-13:05 - Abstract 8: Yoshiko Ikushima**, University of Edinburgh, Scotland *"Adiponectin exerts unexpected effects on liver function, and glucose homeostasis during caloric restriction"* **13:05-13:10 - Oral poster abstract 9: Drenka Trivanović**, Institute for Medical Research, National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia *"Retained adipogenic potential and proinflammatory features of bone marrow mesenchymal stromal cells of metastatic breast cancer patients"* **13:10-13:15 - Oral poster abstract 10: Bram van der Eerden**, Erasmus University Medical Center, Rotterdam, The Netherlands *"Reduced bone marrow adiposity in anti-Müllerian hormone deficient mice is supported by decreased marrow adipocyte marker gene expression"* **13:15-13:20 - Oral poster abstract 11: Jesus Arcedo**, University of Malaga, Malaga, Spain *"DEPTOR promotes bone marrow adipose tissue expansion in calorie restricted mice"* **13:20-13:25 - Oral poster abstract 12: Young Eun Park**, University of Oxford, Oxford, United Kingdom *"Bone marrow adiposity disrupts the dormant niche in multiple myeloma"* **13:25-13:30 - Oral poster abstract 13: Nicko Widjaja**, Institute of Biomedicine, University of Turku, Turku, Finland *"Evaluation of bone marrow glucose uptake and adiposity in male rats after diet and exercise interventions"*
13:30 - 14:30	**Lunch - POSTER SESSION** *(Odd number poster authors to present from 14:00 - 14:30)*	

	***TOPIC**: Quantifying marrow from bench to bedside* ***Chairs**: Pouneh Fazeli & Young Park*	
14:30 - 15:00	**INVITED LECTURE 4**	**Quantifying Marrow Fat in Animal Models: New Techniques** *Speaker: **Greet Kerckhofs*** *Leuven University, Leuven, Belgium*
15:00 - 15:30	**INVITED LECTURE 5**	**Marrow Adiposity Measurement on MRI and CT: Heterogeneity of Effects Between Central Versus Peripheral Regions of Interests** *Speaker: **Andy Wong*** *University of Toronto, Toronto, Ontario, Canada*
15:30 - 16:20	**Plenary Session 3**	**15:30-15:45 - Abstract 14: Alexis Wilson**, Wayne State University, Detroit, Michigan, USA *"Tumor adaptive response to adipocyte-induced stress in bone metastatic niche: the functional interplay between stearoyl-CoA desaturase and ATF4"* **15:45-16:00 - Abstract 15: Natalia Zapata Linares,** Sorbonne Université, INSERM, Paris, France *"Distinct functional profiles of epiphyseal and metaphyseal bone marrow adipocytes in human osteoarthritis: from transcriptomics to therapeutic targets"* **16:00-16:15 - Abstract 16: Zoltán Kellermayer**, University of Pécs Clinical Center, Pécs, Hungary *"Analyzing the bone marrow adipose tissue in multiple myeloma patients"* **16:15-16:20 - Oral poster abstract 17: Guillaume Falgayrac**, MABLab ULR4490, Lille, France *"Spontaneous Raman and Stimulated Raman Spectroscopy for the analysis of adipocytes"*
16:30 - 17:00	**Coffee Break - POSTER SESSION** (Even number poster authors to present)	
17:00 - 17:45	**BMAS General Assembly**	**President Bram van der Eerden**, Erasmus University Medical Center, Rotterdam, The Netherlands
17:45 - 18:45	**TRAINEE SESSION**	
19:00 - 20:30	**RECEPTION**	

THURSDAY, SEPTEMBER 26th, 2024

TIME	SESSION	DETAILS
08:00 - 9:00	**WORKING GROUP MEETINGS**	• **WG1. Nomenclature** • **WG2. Methodologies** • **WG4. Public Engagement**
		***TOPIC**: Clinical implications of increasing marrow fat* ***Chairs**: Nathalie Bock & Natalia Zapata Linares*
09:00 - 9:30	**INVITED LECTURE 6**	**Obesity and Marrow Adiposity: Metabolic Interactions** *Speaker: **Tiffany Kim*** *UCSF, San Francisco, California, USA*
09:30 - 9:50	**INVITED LECTURE 7**	**Genomic Approach to Hypothesis Generation: Bone and Fat, Alone and Together** *Speaker: **David Karasik*** *Azrieli Faculty of Medicine, Safed, Israel*
9:50 - 11:00	**Plenary Session 4**	**9:50-10:05 - Abstract 18: Mareen Storbeck**, Julius Wolff Institute, Berlin Institute of Health at Charité – Universitätsmedizin Berlin, Germany *"Unravelling the plasticity of bone marrow adipose tissue: Implications for bone healing"* **10:05-10:20 - Abstract 19: Léa Loisay**, Lausanne University Hospital, Lausanne, Switzerland *"Omega-6 Arachidonic acid is increased in Osteoarthritis Bone Marrow Adipose Tissue and negatively impacts osteogenesis"* **10:20-10:35 - Abstract 20: Samantha Costa**, Maine Medical Center Research Institute, Scarborough, ME, USA *"Obesity-Induced Expansion of Bone Marrow Adipocytes Promotes Myeloid Cell Infiltration and Osteoclastogenesis"* **10:35-10:50 - Abstract 21: Hai-Bin Ruan**, University of Minnesota, Minneapolis, MN, USA *"Developmental and pathological bone-fat imbalance due to impaired stromal O-GlcNAcylation"* **10:50-10:55 - Oral poster abstract 22: Maren Döring**, Heinrich Heine University, Düsseldorf, Germany *"Investigation of the Hyaluronan-rich Matrix in Bone Marrow Adipose Tissue during the development and progression of Type 2 Diabetes"* **10:55-11:00 - Oral poster abstract 23: Worachet Promruk**, The Roslin Institute, University of Edinburgh, Edinburgh, United Kingdom and Chulabhorn Royal Academy, Bangkok, Thailand *"Bone marrow adipocyte expansion in experimental chronic kidney disease is not a consequence of altered differentiation of precursor cells"*
11:00 - 11:30	**Coffee Break - POSTER SESSION**	
		***TOPIC**: BMAT as a therapeutic target* ***Chairs**: Hai-Bin Ruan & Beatriz Gamez Molina*
		11:30-11:45 - Abstract 24: Ahmed Al Saedi, Harvard Medical School and Boston Children's Hospital, Boston MA, USA *"A novel role of CXXC Finger Protein1 in osteoblast differentiation and adipogenesis during the early stages of bone development."*
11:45 - 12:15	**INVITED LECTURE 8**	**Next Generation Bone Stimulation: Bone Anabolic Epigenetic Drugs** *Speaker: **Andre van Wijnen*** *University of Vermont, Burlington, Vermont, USA*
12:15 - 12:45	**INVITED LECTURE 9**	**Targeting Lipid Products Specific of BMAT** *Speaker: **Marco Brotto*** *University of Arlington, Arlington, Texas, USA*
12:45 - 13:15	**Awards & Closing Remarks** **BMAS President Bram van der Eerden**, Erasmus University Medical Center, Rotterdam, The Netherlands	

Marrow adiposity measurement on MRI and CT: heterogeneity of effects between central versus peripheral regions of interests



Dr. Andy Kin Wong

Dr. Andy Kin On Wong is a methodological imaging data scientist and epidemiologist with over 15 years of experience practicing the science of image acquisition, algorithmic quantification, and association with clinical outcomes in the musculoskeletal disease area. His clinical studies in osteoporosis, sarcopenia, and osteoarthritis combined with skills in longitudinal data and image modeling have led his team to develop a research program in Musculoskeletal Interactions focused on the population health of older adults. His more recent work on fat infiltration into bones and muscles is revealing critical damage across multiple disease processes. His work in these areas is funded by CIHR and the Arthritis Society.

Bone Marrow Mechanosensitivity

Prof. Glen Niebur

Professor Niebur's research is focused on bone health, particularly the changes in mechanical properties associated with diseases like osteoporosis, cancer, and diabetes. The lab's overarching goal is to understand how mechanics and biology intersect to control the maintenance of normal bone strength. Their current focus is on how the interaction of mechanical forces and deformations in bone during activities of daily living can alter the signaling molecules produced by cells in the bone and marrow, and how they are translated into formation or removal of bone tissue at the microscopic scale. Professor Niebur's group uses bioreactor culture systems to directly apply mechanical stimulation to live bone samples obtained from both animals and humans. Medical imaging methods, such as computed tomography (CT) are used to image and quantify the detailed structure of the bone samples and to create computational models that can be applied to assess the mechanical properties and loads at the micron scale. These experiments are complemented by cell culture experiments on two-dimensional surfaces and in three-dimensional gels.

Professor Niebur is also director of Notre Dame's interdisciplinary Bioengineering PhD program.

Is BMAT ready for space exploration?

Dr. Guy Trudel

Dr. Guy Trudel runs a clinical practice and research program in Ottawa, Canada. His tertiary academic rehabilitation unit delivers rehabilitation care to people after Polytrauma, ICU, Transplant, Cancer, Burn and COVID Rehabilitation.

For the past 25 years, as Director of the Bone and Joint Research Laboratory, Dr Trudel has pursued clinical and laboratory-based research on the musculoskeletal complications of immobility. His participants are recruited worldwide and include astronauts on their missions to space or to the International Space Station. A large network of collaborators in Ottawa (radiology, engineering, orthopedics, biochemistry, etc…) and internationally contribute to this research. Dr. Trudel is involved with undergraduate and postgraduate teaching at the University of Ottawa. Dr. Trudel has received over 8 million dollars as Principal Investigator and over 50 million dollars in Co-Investigations. His team has published over 100 original research papers.

Senescence of Bone Marrow Adipocytes

Dr. Mei Wan

Mei Wan, Ph.D. is Frank J. Frassica Professor at the Department of Orthopaedic Surgery and the Center for Musculoskeletal Research in Johns Hopkins University. Dr. Wan's research focuses on the contribution of fundamental aging processes, particularly cellular senescence, to bone health and disease. Another line of Dr. Wan's research is to understand the mechanisms by which the bone-derived cues regulate the aging process of other organs such as vascular system and brain. The impact of Dr. Wan's research extends across different disciplines as testified by her publication record, which includes papers in Cell Metabolism, Nature Communications, Journal Clinical Investigation, Advanced Science, Gene & Development, PNAS, eLife, Bone Research, etc. The research program of her laboratory has been continuously funded by NIH. Dr. Wan served on the editorial boards of two leading skeletal-related journals, the Journal of Bone and Mineral Research and Bone Research. Since 2021, she serves on the Reviewing Editor Board of eLife. Dr. Wan has been a standing member on NIH SBSR study section.

Introduction to the International Federation of Musculoskeletal Research Societies, IFMRS

Dr. Federico Moscogiuri

Independent consultant and CEO of the International Federation of Musculoskeletal Research Societies.

Quantifying Marrow Fat in Animal Models: New Techniques

Dr. Greet Kerckhofs

Associate Professor at the Université catholique de Louvain and a Visiting Professor at KU Leuven.

Next Generation Bone Stimulation: Bone Anabolic Epigenetic Drugs

Dr. Andre van Wijnen

Andre van Wijnen received training in biochemistry at the University of Utrecht (Utrecht, Netherlands), molecular biology at the University of Florida (Gainesville, FL, USA) and biomedical sciences at the University of Massachusetts Medical School (Worcester, MA, USA). At UMass, he ascended through the academic ranks to full professor. After a 10 year stay at Mayo Clinic (Rochester, MN, USA), he recently moved to the University of Vermont (Burlington, VT) where he continues studies on fundamental and translational studies in skeletal regenerative medicine and bone biology, while addressing questions related to endocrine and orthopedic disorders, skeletal development and cancer. In numbers, he has authored >700 PubMed papers that have been collectively cited >60,000 times (H-index=116), as well as mentored >100 trainees, students, post-doctoral associates and clinical fellows. He is the 2021 recipient of the ASBMR Louis Avioli Award and the 2024 recipient of the ECTS Mike Horton Award.

Obesity and Marrow Adiposity: Metabolic Interactions

Dr. Tiffany Kim

Dr. Tiffany Kim is endocrinologist, Assistant Professor of Medicine at the University of California, San Francisco (UCSF) and Staff Physician at the San Francisco VA Health Care System (SFVAHCS). Her clinical research program is focused on skeletal metabolism in obesity and diabetes.

As an endocrinologist, Dr. Kim routinely cares for patients with skeletal and metabolic diseases. She became interested in the relationship between bone and fat metabolism when observing that her patients with obesity and diabetes also suffered from osteoporosis, despite the fact that obesity is traditionally considered protective against fracture. As an early-stage investigator, Dr. Kim pursued a research program focused on the effects of bariatric surgery on the skeleton. This work has yielded important insights into mechanisms of diabetic bone disease, including dynamic changes in bone marrow adiposity. She conducted a prospective study of vertebral bone marrow adiposity and bone mineral density (BMD) in obese adults, with and without diabetes, undergoing gastric bypass surgery. She was the clinical lead and first author on the manuscript, which demonstrated that improvements in glycemic control – rather than weight loss – were associated with declines in marrow adiposity. An inverse relationship between changes in marrow adiposity and BMD was also identified. These results have exciting implications for diabetic bone disease, where increased levels of marrow adiposity in diabetic bone may have pathologic consequences. Dr. Kim currently examining the role of bone marrow adiposity in diabetic bone disease in a prospective observational cohort undergoing improved glycemic control by medical management.

Targeting Lipid Products Specific of BMAT

Dr. Marco Brotto

Dr. Marco Brotto is the Director of the Bone-Muscle Research Center at the College of Nursing & Health Innovation at the University of Texas at Arlington. Dr. Brotto started his career as a Nurse Clinician and was trained on Pharmacology, Biophysics, Physiology and Cell Biology. He is an established investigator of the AHA and NIH. He is also the George & Mary Hazel Jay Endowed Professor at UTA. He has over 110 publications and his major research interests are muscle aging sarcopenia and bone-muscle crosstalk. He is also well known for his expertise in EC Coupling research applied to muscle physiology and aging. His studies have contributed to a deeper understanding of muscle fatigue and muscle aging. Some of his translational studies have helped with new concepts and insights into the risk of falls in older adults. His research is vigorously and generously funded by the National Institutes of Health.

Genomic Approach for Hypothesis Generation: Bone and Fat, Alone and Together

Dr. David Karasik

Professor, Azrieli Faculty of Medicine, Bar-Ilan University, Safed, Israel

The primary objective of Karasik's research group is in identifying genes involved in the interpersonal variation of complex musculoskeletal diseases. The ultimate goal of genetic discovery is to define mechanisms that underlie an association of genetic variant-disease. Identification of genes governing bone mass, muscle mass, and bone and muscle strength, is an important step toward understanding the underlying elements of bone-muscle cross-talk in health and pathology. For functional validation of the associated genes/variants, they utilize the zebrafish (*Danio rerio*) as a valuable model for the human's physiology and disease, since genomic organization, regulatory networks, and the developmental pattern of these fish are largely conserved with mammals. The zebrafish are highly amenable to both molecular analysis and genetic manipulation, which allows establishing high-throughput screening platforms. By applying a CRISPR/Cas9 mediated genome editing to establish mutated zebrafish lines, they then characterize resulting phenotypes by sophisticated techniques.