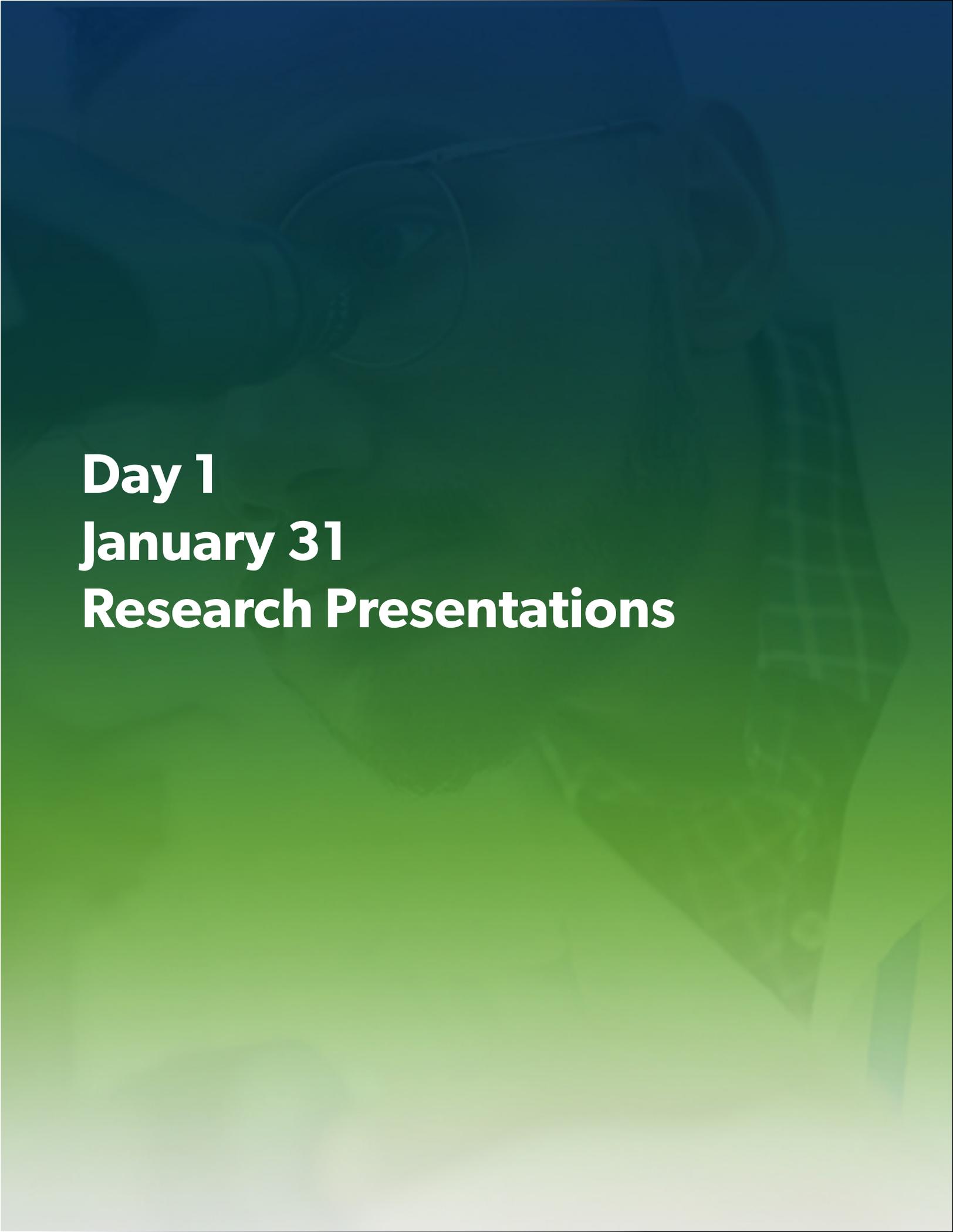


The 4th Annual Canadian Arthritis Research Conference: Arthritis across the lifespan

Research Presentation Days Abstracts & Presenter Information

January 31, February 6 & 14, 2023



A person wearing glasses and a white lab coat, looking down at a document. The background is a gradient from dark blue at the top to light green at the bottom.

Day 1
January 31
Research Presentations

Listed in alphabetical order by first name

Amit Sandhu

BIO

Amit Sandhu is a postdoctoral fellow in the lab of Dr. Mohit Kapoor at Schroeder Arthritis Institute, University Health Network, Toronto. Currently he is extensively working on the microRNA extraction, library preparation and sequencing to identify and compare miRNA expression patterns in plasma, synovial fluid, and urine of posttraumatic osteoarthritis patients undergoing ACL reconstruction surgery and knee OA patients undergoing total knee arthroplasty. He is also interested in looking at the levels of cartilage degradation fragments in these patients. He received his doctorate from the Postgraduate Institute of Medical Education and Research (PGIMER) in Chandigarh, INDIA. During his PhD, he focused on determining the efficacy and adverse events of methotrexate glutamation in patients with rheumatoid arthritis. Apart from research, he loves to capture nature through his lenses, and spending time with family, and close friends.



Plain language summary:

This study aimed to find the relation between cartilage degradation product (C2C) and post-surgical outcome in the urine and synovial fluid samples of patients with total knee arthroplasty. The ratio of sfC2C and uC2C was observed to be associated with patient-reported pain and function outcomes.

Keywords

Total knee arthroplasty, Type II collagen, C2C-HUSA, WOMAC, Synovial fluid

Anthony Teoli

BIO

Anthony Teoli is a physiotherapist clinician and PhD Candidate in Rehabilitation Science at McGill University. His current research involves better understanding gait biomechanics, mechanisms of knee osteoarthritis initiation and progression, clinical outcomes in patients following total knee arthroplasty and knowledge translation. Anthony has presented his research and has presented on best practice for knee osteoarthritis management at provincial, national and international conferences. He also provides a continuing education courses on knee osteoarthritis assessment and management for rehabilitation professionals, and he is the Founder/President of InfoPhysiotherapy, an online platform dedicated to providing evidence-based lectures and courses for physiotherapists worldwide.



Plain language summary:

Patients with knee osteoarthritis have alterations in their walking pattern. Research has not examined how the body coordinates motion between the joints. This study compared joint coordination during walking between patients with knee osteoarthritis and healthy adults. Cameras and reflective markers captured the walking pattern of participants. We calculated variables that examine how the motion of the joints is coordinated. Participants with severe knee osteoarthritis had less flexible walking patterns and would likely have difficulty adapting to more challenging environments.

Keywords

Knee osteoarthritis, inter-segment coordination, gait, biomechanics

Atoosa Ziyaeyan

BIO

I'm currently a first-year Ph.D. student at the University of Toronto under the supervision of Dr. Sowmya Viswanathan. I'm presenting my master's project to CARC this year that was done under the supervision of Dr. Sowmya Viswanathan and Dr. Vinod Chandran. As part of my Master's project, I developed an explant ex vivo osteochondral-synovium model using human tissues that can be used to evaluate novel therapies for psoriatic arthritis.



Plain language summary:

Many patients with psoriatic arthritis don't respond to the treatments used for this disease. Patients who respond to a certain drug might stop responding after a while. We've made a model that allows us to look at the effects of various medications on the knee joint of the patients and can be personalized to each patient by using their own tissues. This model allows us to include the tissues and synovial fluid donated to us by patients and examine the effects of various drugs on the tissues of the consented patients.

Keywords

Psoriatic arthritis, Explant, Osteochondral, Synovium, Model

Elsa-Lynn Nassar

BIO

Elsa-Lynn Nassar is an MSc student in Psychiatry at McGill University. She received her BA (Hons) in Psychology from Concordia University in 2021. She is a trainee member of the Scleroderma Patient-centered Intervention Network (SPIN; <https://www.spinsclero.com/>), led by her supervisor, Dr. Brett Thombs. Her research focuses on knowledge translation, patient engagement in research, and knowledge synthesis. Elsa is also involved in research on mental health, pain, and non-pharmacological interventions in systemic sclerosis, as well as meta-research, which involves examining how the design, conduct, and reporting of medical research may lead to bias.



Plain language summary:

Scleroderma is a rare rheumatic disease that presents differently in different patients and has an unpredictable course. People with scleroderma face substantial burden and may be at risk for depression and anxiety, but little is known about mental health in this disease. We reviewed and summarized evidence on how common mental health disorders are in scleroderma and associated factors. We found that depression and anxiety are much more common than in the general population. Factors such as age and disease duration and severity were associated with more symptoms.

Keywords

Systemic sclerosis; scleroderma; mental health; anxiety; depression; evidence synthesis; living systematic review

Enoch Yau

BIO

Second-year MSc student at the University of Toronto's Institute of Medical Sciences under the supervision of Dr. Robert Inman.

Plain language summary:

Recent work has shown that some of the immune cells responsible for driving inflammation in joints of spondyloarthritis patients may originate from the gut. How these cells migrate from the gut to joint is unknown, but may be mediated by proteins called integrins. My project aimed to study how blocking integrins in an animal model would affect disease progression. Since integrin blockers have been used to treat other diseases in humans, I hope the results of my project can contribute towards future treatments for spondyloarthritis patients.

Keywords

axSpA, immunology, immune trafficking, integrins, SKG mouse model



Fataneh Tavasolian

BIO

I am a trained immunologist with a strong interest and background in epigenetic research. My top research interests include human immunology, immune profiling, epigenetics, microRNA, and cell-cell communication research. I have chosen to do my post-doctoral studies with Dr. R. Inman at the Krembil Research Institute with the goal of conducting cutting-edge epigenetics research for patients with AS. The central theme of our research is to define the epigenetic drivers of this chronic inflammation and to harness these insights for novel therapeutic approaches to this disabling disease.

Plain language summary:

This is a three-year retrospective investigator-initiated study to define the role of exosomal miRNA signatures in Ankylosing Spondylitis. AS is a chronic autoimmune inflammatory disease that commonly affects the joints of the spine. But the fundamental cause of AS remains unknown. In addition, no precise biomarkers are available to monitor the course of AS, predict outcomes, and monitor the response to treatment. Although in our study, we will try to indicate circulating exosomal miRNAs as promising diagnostic biomarkers of AS.

Keywords

Ankylosing Spondylitis, microRNA, Exosomes, Extracellular Vesicles, Biomarker



Hermine Lore Nguena Nguéfack

BIO

Ms. Nguena Nguéfack is a biostatistician and PhD student in health sciences research, under the supervision of Dre Anaïs Lacasse, at Université du Québec en Abitibi-Témiscamingue (UQAT) located in Rouyn-Noranda, Quebec, Canada. Member of UQAT's Chronic Pain Epidemiology Research Laboratory, Ms. Nguena Nguéfack specialized in person-centered statistical approaches and analysis of medico-administrative databases for a better understanding of healthcare utilization and treatment trajectories among persons living with chronic pain.



Plain language summary:

Grâce aux données administratives du Québec jumelées aux enquêtes de Statistique Canada, notre étude visait à regrouper les personnes atteintes d'arthrose présentant des profils similaires d'utilisation des soins de santé au fil du temps. Trois profils ont été trouvés : 1) utilisation élevée des soins de santé, toutes causes confondues, et hospitalisations plus fréquentes liées à l'arthrose que les autres groupes (31,6%), 2) utilisation modérée des soins de santé, toutes causes confondues, et visites plus fréquentes aux urgences liées à l'arthrose que les autres groupes, 3) faible utilisation

Keywords

State sequence analysis, Cluster, Osteoarthritis, Care trajectories, Pain, Healthcare utilization, Canadian community health survey, TorSaDE cohort.

James Young

BIO

James Young is the Postdoctoral Fellow in Integrated Arthritis Care in the Schroeder Arthritis Institute at the University Health Network. He also holds a position as a Postdoctoral Research Fellow in the Center for Muscle and Joint Health at the University of Southern Denmark. His current work investigating treatment outcomes following total joint replacement versus patient education and exercise therapy programs in people with knee and hip osteoarthritis is supported by an Arthritis Society Canada Postdoctoral Fellowship.



Plain language summary:

Education and exercise programs for knee osteoarthritis may help reduce the number of people requiring knee surgery. Before we can compare outcomes following these treatments, we must know if patients getting these treatments are similar to begin with. We found considerable overlap in profile and pain and disability scores between surgical and non-surgical patients. It appears reasonable, therefore, to explore if certain patient profiles have similar (or dissimilar) benefit with education and exercise programs and could help delay or avoid surgery.

Keywords

Knee osteoarthritis, total joint replacement, education, exercise programs

Jenny Wei

BIO

Jenny Wei is completing her bachelor's degree in Mechanical Engineering with a minor in Bioengineering at the University of Toronto. Under the supervision of Dr. May Choi at the University of Calgary, Jenny conducted research on the biomarkers of sporadic inclusion body myositis using machine learning approaches.

Plain language summary:

Autoimmune inflammatory myopathies (AIMs) cause can permanent muscle weakness leading to disability. Sporadic inclusion body myositis is one type of AIM that is often misdiagnosed. There is a need to improve sIBM detection. Biomarkers are molecules found in the body that can be a sign of a certain disease. Researchers have identified numerous biomarkers that are found in patients with AIM. However, little is known about the biomarkers for sIBM and whether they are different from AIM biomarkers. The objective of this study was to identify biomarkers to improve sIBM detection.

Keywords

Biomarkers, machine learning, myositis, autoimmune disease, artificial intelligence, ANA, clustering, clinical phenotypes



Juan Manuel Colazo

BIO

Juan is an Argentine-Canadian currently pursuing an MD/PhD program at Vanderbilt University. He completed his BSc. honors degree in Biochemistry at the University of Alberta (Canada) in 2017. He joined the Vanderbilt Medical Scientist Training Program (MSTP) in 2017 to get combined MD/PhD training. He completed 1 year of lecture-based medical training and 1 year of clerkship-based medical training before joining his PhD thesis lab in 2019. He is currently working on bioengineered platforms for systemic and local siRNA drug delivery for the treatment of rheumatologic conditions such as Osteoarthritis and Rheumatoid Arthritis. He is an avid volunteer/director at Vanderbilt's student run Shade Tree Clinic where he has grown a passion for treating Hispanic patients with musculoskeletal conditions. He plans on applying to Orthopaedic Surgery residency in the fall of 2023. Outside of the clinic/lab, Juan enjoys playing soccer, coaching soccer, hiking, and playing with his puppy, Zoe. Profile: <https://medschool.vanderbilt.edu/mstp/person/juan-manuel-colazo/>



Plain language summary:

A unique therapeutic was applied here in the context of arthritis. It was shown to be safe, provide effective cartilage/joint delivery, and provide homing and sustained target gene silencing bioactivity in both osteoarthritis and rheumatoid arthritis mouse models. This therapeutic was able to reduce pain and protect joint destruction, greater than current clinical gold standards. Overall, this therapeutic shows promise as a systemic anti-MMP13-specific therapy and represents a platform technology that can be adapted for other rheumatic disease-driver genes. Further studies are warranted.

Keywords

Albumin, Albumin-siRNA, siRNA conjugates, lipid conjugates, matrix metalloproteinase, MMP, MMP13, siRNA, RNAi, Osteoarthritis, Post-traumatic osteoarthritis, multi-joint osteoarthritis, K/BxN, rheumatoid arthritis, nucleic acid therapeutics.

Kala Sundararajan *on behalf of* Y. Raja Rampersaud

BIO

Ms. Sundararajan joined the Division of Orthopaedic Surgery at Toronto Western Hospital in 2012. In her role as a Research Associate, she is responsible for managing the Division's data holdings. Her analysis projects in the Division have focused on patient-reported clinical outcomes in low back pain and orthopaedic surgery, as well as patient safety issues including perioperative adverse events and opioid handling behaviours.

She received her B.Sc. in Biomedical Sciences at the University of Waterloo in 2009, and completed her M.Sc. in Epidemiology at the University of Western Ontario in 2012 under the supervision of Dr. Sisira Sarma. For her Master's thesis, she used finite mixture modelling to identify latent subclasses of Canadian adults with distinct relationships between diet quality and obesity.

Plain language summary:

Individuals with low back pain (LBP) require different treatments, but the source of pain, and thus individualized treatment, can be hard to determine. Using advanced statistical techniques, we aimed to identify LBP subgroups with easily identifiable characteristics within the larger LBP population. We found four distinct subgroups of LBP patients; one had traits consistent with spine osteoarthritis. This subgroup was more likely to have persistent pain and disability. It is important for all clinicians to identify and individually manage LBP subgroups such as spine osteoarthritis.

Keywords

Phenotype ; Musculoskeletal Disorders ; Patient Reported Outcomes ; Clinical Characteristics



Madeline Theodorlis and Angelina Abbaticchio *on behalf of* Anna Gagliardi

BIO

Madeline (Maddie) Theodorlis is a Research Associate in the Gagliardi Lab at the Toronto General Hospital Research Institute (TGHRI) at University Health Network (UHN) in Toronto. She obtained her Bachelor of Health Sciences from Western University and her Master of Public Health from Queen's University, which only ignited her passion for early intervention and women's health. She is currently coordinating the study "Co-generating strategies to support equitable person-centred osteoarthritis diagnosis and management" led by Dr. Anna Gagliardi and funded by Arthritis Society Canada, which seeks to identify strategies to improve osteoarthritis care for diverse women in Canada.

Angelina (Angel) Abbaticchio is a Research Associate in the Gagliardi Lab at the Toronto General Hospital Research Institute at University Health Network. She obtained her Bachelor of Public Affairs and Policy Management from Carleton University and recently graduated with her Master of Public Health from Western University, strengthening her desire to address inequities and improve population health through public policy. Angelina has gained a keen interest in health services research through her contributions to Dr. Anna Gagliardi's research study funded by Arthritis Society Canada, which aims to identify strategies to improve person-centred osteoarthritis care for diverse women in Canada.



Madeline Theodorlis



Angelina Abbaticchio

Plain language summary:

Osteoarthritis (OA) is more common and severe among women, and more so in women of colour, yet they often do not receive ideal care or advice. We searched for and examined the content of published research, clinical guidelines, and government policies to see if they provide instructions on how healthcare providers and organizations can ensure access to and quality of OA care for diverse women. Most documents failed to provide such instructions. In future research, we will interview diverse women and healthcare providers and managers to identify solutions for improving OA care.

Keywords

Osteoarthritis, patient-centred care, equitable care, women's health, diverse women, healthcare quality

Madhu Baghel

BIO

Dr. Madhu Baghel is a Post-Doctoral Fellow in Dr. S. Amanda Ali's Musculoskeletal Genomics Laboratory at the Bone and Joint Center, Henry Ford Health, Detroit, MI, USA. Madhu's academic training includes a BSc (2013) and MSc (2015) in Biochemistry from the University of Delhi, India. Her PhD research at the National Institute of Immunology, India (2021) focused on understanding the role of microenvironment in osteogenesis. Her research interests are in the field of prevention and management of musculoskeletal diseases using multi-omics approaches. In the Ali Lab, Madhu works on identifying and characterizing the role of microRNAs in arthritis progression from early- to late-stage disease.



Plain language summary:

The overall goal of this study is to identify circulating factors (microRNAs) as novel markers that distinguish early rheumatoid arthritis (RA) patients from both early osteoarthritis (OA) patients and healthy individuals. This project is important because it has the potential to improve patient care by supporting development of a diagnostic blood test for early RA. The ability to correctly diagnose early RA in primary care settings will enable timely referral to a rheumatologist for appropriate interventions, thereby reducing the overall burden of disease.

Keywords

Rheumatoid arthritis, osteoarthritis, biomarkers, non-coding RNAs, microRNA-sequencing.

Pakeezah Saadat

BIO

Pakeezah Saadat is a PhD candidate at the University of Toronto. Her doctoral work seeks to understand clinical outcomes in osteoarthritis research, mainly of knee and hip osteoarthritis. She currently holds the Arthritis Society PhD Salary award.



Plain language summary:

Our project aims to summarize the MIC and MID estimates for pain and physical function outcomes. The first can help clinicians guide the patient's treatment course by defining thresholds for treatment response. The latter can help define whether a difference between two interventions is clinically relevant and can also inform sample size considerations in clinical trials. A correct summary of the two oft-conflated thresholds of change separately will inform which treatments are effective in future research directly impacting patients' treatment course.

Keywords

Minimum important change, minimum important difference, knee osteoarthritis, hip osteoarthritis, meta-analysis

Patricia Remalante-Rayco *on behalf of* Yassir Daghistani

BIO

Patricia Remalante-Rayco is a Clinical Research Fellow at the Spondylitis Program, Toronto Western Hospital, University Health Network. She trained in Internal Medicine and Rheumatology at the University of the Philippines – Philippine General Hospital. She is currently completing her Master of Science degree in Clinical Epidemiology from the University of the Philippines. Prior to coming to Toronto, she was appointed Associate Professor in the College of Medicine at the De La Salle Medical and Health Sciences Institute and worked as an evidence review expert for the Philippine COVID-19 Guidelines under the National Institutes of Health. She is a recipient of the 2021 Fellowship Grant from the Asia Pacific League of Associations for Rheumatology (APLAR).



Plain language summary:

This study aim to assess the differences in clinical features between patients who have Axial Spondylarthritis (AxSpA) in the presence or absence of inflammatory bowel disease (IBD). AxSpA is a chronic inflammatory arthritis, which affects mainly the spine and sacroiliac joints. 10-12% of AxSpA patients also have IBD, a chronic disease that inflames the lining of the gastrointestinal tract. This study helps to understand the interaction between the two diseases and whether their co-presence leads to any difference in the disease profile or necessitates any differences in management.

Keywords

Spondyloarthritis, inflammatory bowel disease, database

Sabrina Provencher

BIO

Sabrina Provencher is a first-year master's student at McGill University working with the Scleroderma Patient-centered Intervention Network Team (SPIN), under the supervision of Dr. Brett D. Thombs. She completed her undergraduate honours psychology degree, also at McGill University. Her research focuses on symptoms of anxiety and depression in individuals with scleroderma. She is also working on reducing a scale that measures self-efficacy in support group leaders.



Plain language summary:

We used a statistical model to examine associations of personal and scleroderma disease variables, plus overlap syndromes (e.g., rheumatoid arthritis, Sjogren's syndrome) with depression and anxiety. Many factors are associated with symptoms of depression and anxiety, but the link between any one factor and those symptoms is small. There is no way to predict who might have depression or anxiety from personal characteristics or disease severity. People with scleroderma who are concerned that they may have depression or anxiety should discuss their concerns with their health care provider.

Keywords

Systemic sclerosis, scleroderma, anxiety symptoms, depression symptoms, factors of SSc, predictors

Sami Alsabri

BIO

Sami G. Alsabri is a PhD student in the Pharmacology and Physiology Program at the University of Montreal. He obtained his master's degree from Wright State University, OH, US. His MSc. project was on the study of the potential therapeutic effect of extracellular microvesicles in wound healing.

Currently he is carrying out his PhD studies under the supervision of Dr. H. Fahmi at Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM). His project focuses on the role of a key enzyme in prostaglandin E2 metabolism, 15 Prostaglandin Dehydrogenase, in the pathogenesis of osteoarthritis.



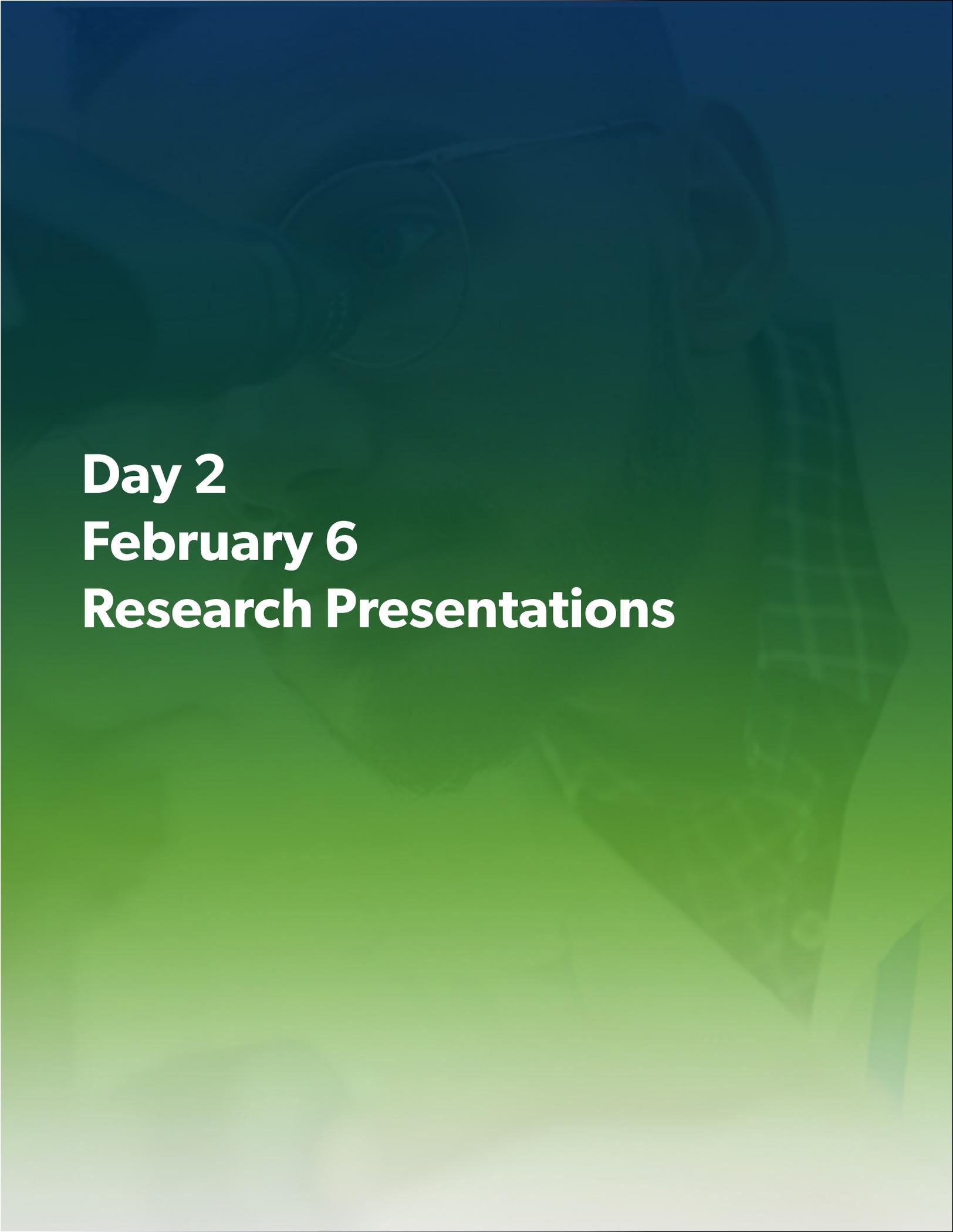
Plain language summary:

Osteoarthritis (OA), among the elderly, is the most common joint disorder. It is distinguished by progressive cartilage degradation, synovitis, subchondral bone remodeling, and pain.

15-hydroxyprostaglandin dehydrogenase (15-PGDH) is responsible for the catabolism of PGE2. little is known about the regulation of 15-PGDH expression in this Cartilage. This study intended to evaluate the expression and function of 15-PGDH in cartilage.

Keywords

Cartilage, Osteoarthritis, 15 prostaglandin dehydrogenase, Prostaglandin E2, Chondrocytes, Inflammation



Day 2
February 6
Research Presentations

Listed in alphabetical order by first name

Addison Pacheco

BIO

Addison Pacheco is a 3rd year PhD student supervised by Dr. Robert Inman and funded through The Arthritis Society Graduate Salary Award. His work entails using cutting-edge technology to unmask the role regulatory immune cells (Tregs) play during inflammation in Ankylosing Spondylitis patients.



Plain language summary:

My project looks at biomarker differences in patients that respond to Secukinumab treatment and those that have no response. This provides clinicians a potential analysis to predict biologic outcome. Additionally, differences that occur with Secukinumab treatment that does not occur in nonresponders could provide insight into future treatments for patients.

Keywords

Ankylosing Spondylitis, Regulatory T cells, Secukinumab, Inflammation, IL-17A

Amit Sandhu

BIO

Amit Sandhu is a postdoctoral fellow in the lab of Dr. Mohit Kapoor at Schroeder Arthritis Institute, University Health Network, Toronto. Currently he is extensively working on the microRNA extraction, library preparation and sequencing to identify and compare miRNA expression patterns in plasma, synovial fluid, and urine of posttraumatic osteoarthritis patients undergoing ACL reconstruction surgery and knee OA patients undergoing total knee arthroplasty. He is also interested in looking at the levels of cartilage degradation fragments in these patients. He received his doctorate from the Postgraduate Institute of Medical Education and Research (PGIMER) in Chandigarh, INDIA. During his PhD, he focused on determining the efficacy and adverse events of methotrexate glutamation in patients with rheumatoid arthritis. Apart from research, he loves to capture nature through his lenses, and spending time with family, and close friends.



Plain language summary:

The main goal of this study was to identify the distinctive miRNAs as biomarkers for predicting knee pain and functionality early and late post ACL surgery. Hsa-miR-429 expression was observed to be associated with changes in KOOS scores at 2 and 6 weeks after surgery.

Keywords

Anterior cruciate ligament, Post-traumatic osteoarthritis, Knee injury and Osteoarthritis Outcome Score, MicroRNAs, Biomarkers

Anca Maglaviceanu

BIO

Anca graduated with an Honours Bachelor of Science degree at the University of Toronto in Pathobiology (Specialist), Physiology (Major), and Immunology (Minor) programs. She is currently a Master of Science student in the Department of Laboratory Medicine and Pathobiology at the University of Toronto, working under the supervision of Dr. Mohit Kapoor. Her MSc project focuses on elucidating potential disease-modifying mechanisms of Δ^9 -tetrahydrocannabinol in osteoarthritis using human OA joint cells *in vitro* and *in vivo* OA mouse models.



Plain language summary:

Osteoarthritis (OA) affects the whole joint, leading to pain and disability. No disease-modifying treatments are available for OA. The delta-9-tetrahydrocannabinol (THC) cannabinoid has analgesic properties, but insufficient research exists on its effects on OA. We evaluated the effects of THC on pain in mouse models of OA and investigated its disease-modifying potential in extracted joint tissues. We also determined how THC influences the activity of human OA joint cells. Results from this study may inform scientists and clinicians of the potential use of cannabinoids for treating OA.

Keywords

Osteoarthritis, Cannabinoids, Therapeutics, Fibroblast-like Synoviocytes, Chondrocytes, Cell Signaling

Bahaeddine Tilouche

BIO

Baha is a third year PhD candidate in Dr. Daniel Coutu's lab. Their research focuses on the identification of joint stem cells in both an animal model and in humans. Their aim is to identify the different stem cell populations and to study these stem cells in both a healthy and OA model. This will allow for the identification of novel therapeutic targets for joint conditions or develop better stem cell-based therapies for joint pathologies.



Plain language summary:

Osteoarthritis (OA) can often be a debilitating orthopedic condition and affects 15% of Canadians. Current therapies aim to manage the symptoms without an efficient treatment. Stem cells have emerged as a way to treat orthopedic conditions in the last few years. Using mouse genetics, cutting edge microscopy and computational analysis, we aim to study stem cells in both our animal model and in human samples. We aim to understand the key differences between healthy and OA stem cells and to develop new ways to activate these stem cells in order to regenerate the affected tissues.

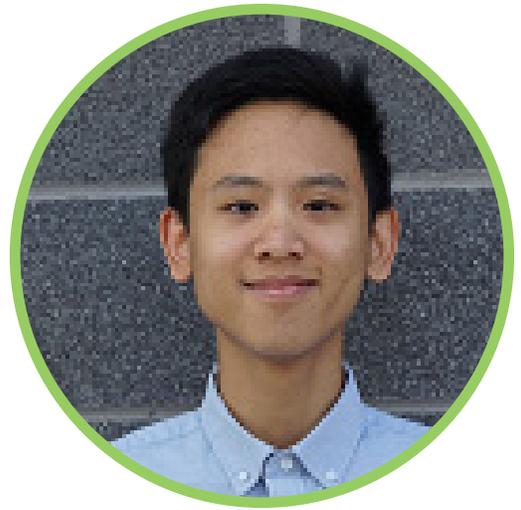
Keywords

Osteoarthritis, Intra-articular adipose tissue, Skeletal stem cells, lineage tracing

Brian Wu

BIO

Brian Wu is a post-doctoral researcher in Dr. Mohit Kapoor's laboratory. His primary interest is in elucidating the protein signaling of ephB4 receptor under the context of fibrosis. His research has shown that fibroblast-derived ephB4 is a crucial driver for the development of fibrosis in lung tissue. Fibrosis is a pathology where healthy lung tissue is replaced with nonfunctional scar tissue, causing loss of organ function. In joints, the synovium undergoes fibrosis and contributes to synovitis, and ultimately joint pain and stiffness. By targeting fibrotic processes, joint diseases including osteoarthritis and rheumatoid arthritis may have better patient outcomes.



Plain language summary:

Fibrosis causes healthy functional tissue, including those within the joint, to become nonfunctional scar tissue which occurs when cells secrete excessive extracellular matrix. Joint tissues that undergo fibrosis lose their function and can contribute to joint damage to promote disease progression.

My work has discovered a novel fibrotic role in the protein ephB4 receptor. This is the first study to directly relate the function of ephB4 to secretion of extracellular matrix. Additionally, I have shown that removing or inhibiting ephB4 prevents severe fibrosis in both mouse tissue and human cells.

Keywords

Fibrosis, Fibroblast, EphB4, Idiopathic Lung Fibrosis

Carolina Muñoz Grajales

BIO

Carolina Muñoz-Grajales, MD, Ph.D., completed her medical training, internal medicine residency, and rheumatology fellowship in Colombia. She came to Toronto in 2017 in order to undertake a Ph.D. in fundamental immunology at the University of Toronto under the supervision of Dr. Joan Wither, with the Schroeder Arthritis Institute. In 2022 she started a postdoctoral clinical fellow in lupus under the supervision of Dr. Zahi Touma also with the Schroeder Arthritis Institute. Dr. Muñoz-Grajales hopes to integrate the knowledge gained from her Ph.D. with her current clinical training to become an effective clinician scientist in systematic lupus erythematosus.



Plain language summary:

Cognitive impairment (CI) is one of the most common symptoms of neuropsychiatric lupus, which negatively impacts quality of life. Therefore, identifying patients at high risk of developing CI is essential to prevent the accrual of damage and disability. However, its cause is largely unknown, and currently, biomarkers for the risk of CI are lacking. Differences in the serum levels of cytokines profile between participants with and without CI were determined. Among the cytokines measured, only calcium-binding proteins S100A8 S100A9 was found to be increased in SLE patients with CI.

Keywords

SLE; NPSLE; Cognitive impairment; Cytokines.

Flávio Teixeira Vieira

BIO

Dr. Flavio Vieira completed his Ph.D., Master's and Bachelor's in Human Nutrition at the University of Brasilia, Brazil, his home country. He completed a visiting Ph.D. period at the University of Alberta, Canada, and an undergraduate visiting period at the University of Porto, Portugal. Dr. Vieira holds Postgraduate diplomas in Clinical Nutrition (Residency Program), and Epidemiology; and holds credentials as Registered Dietitian with a Specialization in Nutrition Therapy from Brazil. He has experience as a Professor in Human Nutrition and as a Technical Consultant at Brazil's Ministry of Health. Dr. Vieira returned to the University of Alberta, Canada where he is now a Postdoctoral Research Fellow.



Plain language summary:

Individuals with obesity and advanced knee osteoarthritis are advised to lose weight to reduce pain and decrease surgical complications should they proceed to surgery. However, simplistic recommendations for weight loss may not be appropriate. Unsupervised weight-loss attempts could lead to vicious cycles of muscle mass losses and fat mass gain, impacting body composition and energy metabolism. Access to accurate energy needs would enable individualized weight-management support, with more effective dietary assessment and intervention, with a focus to preserve muscle mass.

Keywords

Osteoarthritis, obesity, energy metabolism, body composition

James Young

BIO

James Young is the Postdoctoral Fellow in Integrated Arthritis Care in the Schroeder Arthritis Institute at the University Health Network. He also holds a position as a Postdoctoral Research Fellow in the Center for Muscle and Joint Health at the University of Southern Denmark. His current work investigating treatment outcomes following total joint replacement versus patient education and exercise therapy programs in people with knee and hip osteoarthritis is supported by an Arthritis Society Canada Postdoctoral Fellowship.



Plain language summary:

Non-surgical education and exercise programs for hip osteoarthritis are a potential strategy to reduce wait times for surgery. To compare outcomes between these treatments, this project first investigated how comparable the patients getting these treatments are. We found patients are relatively similar across treatment groups and there is considerable overlap in pain and disability scores. Therefore, it is reasonable to explore if similar patients have similar (or dissimilar) benefits with non-surgical care that could delay or potentially avoid surgery.

Keywords

Hip osteoarthritis, total joint replacement, education, exercise programs

Kabriya Thavaratnam

BIO

Kabriya Thavaratnam is a PhD student from the University of Toronto working at the Schroeder Arthritis Institute, University Health Network. She did her master's degree at the University of Zurich in the field of rheumatic autoimmune diseases which familiarized her with her lab's research in arthritis. This motivated her to continue her PhD training in the field of osteoarthritis which is a disease that lacks effective treatment. Kabriya is currently using single nuclei RNA sequencing to identify cell subsets in early and late stages of osteoarthritis to improve the understanding of the osteoarthritis's underlying mechanisms. This study will help develop effective treatments in the future.



Plain language summary:

This project focusses on identifying different cell types that exist in human knee OA synovium at early (KL1) and late (KL3/4) stages of the disease. It is also interested in understanding the functions and roles that these cells play which may advance and maintain disease progression. The importance in understanding this is that if a certain cell type is identified to exacerbate the disease then drugs or therapeutic interventions can be created to stop or slow down disease progression in patients. Identifying this early on can prevent patients from advancing to a KL3/4 stage.

Keywords

Osteoarthritis, inflammation, fibrosis, single nuclei RNA sequencing, synovium, joint, cell subsets

Michael Tang

BIO

Michael Tang is a postdoctoral fellow at Schroder Arthritis Institute, University Health Network, Toronto Ontario. He has a keen interest in immune profiling patients with axial spondyloarthritis (axSpA) using cutting-edge single cell technologies such as mass cytometry and single cell RNA and TCR sequencing. He will be presenting his basic science research investigating cytotoxic T cell (CTL) dysregulation and resistance to immune exhaustion in axSpA patients. His work is funded by the Arthritis Society Postdoctoral Fellowship program.



Plain language summary:

Ankylosing Spondylitis (AS) is a chronic, painful, and debilitating form of inflammatory arthritis that affects roughly 300,000 Canadians each year. Although there are drugs that can temporarily alleviate and manage back pain, the condition is considered incurable. The diagnosis and monitoring of AS is also complicated because there are no clear biological markers identified to monitoring disease progression. The purpose of my research is to understand how proteins and molecules expressed on a type of immune cell, CD8+ T cell, can cause inflammation of the joints.

Keywords

Axial spondyloarthritis, Immune Profiling, CTL, Immune regulation, mass cytometry

Nafiza Anjum Haque

BIO

Nafiza began her master's degree in Human Genetics under the supervision of Dr. Guangju Zhai at Memorial University's division of BioMedical Sciences, Faculty of Medicine, in 2021. Before that, Nafiza received her Bachelor of Medicine and Bachelor of Surgery (MBBS), equivalent to an MD, at Anwer Khan Modern Medical College, Dhaka, Bangladesh. Nafiza's research is currently on a pilot clinical trial investigating the efficacy of L-arginine on patients suffering from primary osteoarthritis who underwent total knee replacement surgery. Her master's project has direct exposure to her using her clinical knowledge and experience in working with patients, specifically with osteoarthritis, prevalent both in her home country, Bangladesh and Canada.



Plain language summary:

With this project we are ultimately trying to meet the challenge of delivering high-quality, cost-effective health care using a high compliance supplement like L-arginine by ensuring that the right patient receives the right treatment at the right time. If this solution works, it will deliver a higher quality of life to the patients with more cost-effective health care, without them going through joint replacement surgeries, ultimately resulting in better quality of life. This clinical trial will provide important information about the efficacy and adverse effects of arginine on osteoarthritis.

Keywords

Osteoarthritis, Knee osteoarthritis, Primary osteoarthritis, Total knee replacement surgery, L-arginine, Gene expression, Real-time PCR, RNA extraction, Cartilage

Nathan J. Neeteson

BIO

Nathan is a research engineer with nearly a decade of experience in experimental design and analysis and a background primarily in fluid dynamics and numerical modelling. He has been pursuing a PhD in biomedical engineering at the University of Calgary since September of 2020. His primary research project uses data from advanced imaging modalities, including HR-pQCT, to investigate the connection between acute knee injuries and the development of post-traumatic degenerative joint disease such as knee osteoarthritis.



Plain language summary:

The micro-scale structure of the bone at a joint is an important component in the development and progression of osteoarthritis (OA). To study bone at these small-scales, we use high resolution computed tomography. The analysis of these images is currently semi-automated and labour-intensive. We are using a large bank of images and advanced computer vision techniques to fully automate this analysis. This will allow us to scale up studies of bone at joints with larger numbers of participants and longer timeframes. The end goal is to facilitate studies that will further our understanding of OA.

Keywords

Deep learning, segmentation, HR-pQCT, computed tomography

Olivia Hendrikx

BIO

Olivia Hendrikx is an Undergraduate student in the Bachelor of Health Sciences program at Queen's University. She is currently an Undergraduate Trainee at SickKids hospital in the field of Neuroscience and Mental Health. Her research at SickKids over the past 2 years has been focused on Childhood Systemic Lupus Erythematosus (cSLE) and how analyzing mental health can improve disease outcomes. Olivia also has a passion for advocacy, guiding her focus on marginalized communities and Adverse Childhood Experiences (ACEs).



Plain language summary:

This study looks at Adverse Childhood Experiences (ACEs). Childhood-onset Systemic Lupus Erythematosus (cSLE) is a long-term inflammatory disease. This study aimed to describe how many ACEs kids with lupus have and the possible effects. We looked at patient notes to determine ACEs and health status. We did not find a connection between ACEs and health. While we could not connect ACEs with the severity of lupus, it was connected mental health problems. We need to look at more patients to better understand the connection between ACEs and health in kids with cSLE.

Keywords

Adverse Childhood Experiences (ACEs), mental health, lupus, disease, rheumatology, autoimmune, psychiatric, neuroscience

Tayah Zhang

BIO

Tayah Zhang earned her Bachelor of Science Honours in Physiology and Pharmacology at the University of Saskatchewan. She has been involved with several studies related to Remote Presence Technology and access to care with experiences in patient-oriented and community-based research. Tayah was awarded the Tri-Agency Canada Graduate Scholarship for her master's program focused on understanding the experiences of chronic musculoskeletal pain from the perspectives of Indigenous communities. Most recently, she worked alongside an Elder and a Knowledge Keeper from Pelican Narrows to adapt a facial pain scale that is now being used as an evaluation tool in MHAC's project 'A Community-Informed Team and Technology Approach to Chronic Back Pain Management in Partnership with a Northern Saskatchewan Cree First Nation'.



Plain language summary:

In Pelican Narrows, a Cree community in Northern Saskatchewan, Elder advisors have indicated that many Western pain scales may not be responsive tools for pain assessments within their community. This study looks to co-develop and evaluate a culturally responsive pain assessment tool, in collaboration with an Elder and Knowledge Keeper from Pelican Narrows. We hope that the new pain scale will allow clinicians and Indigenous patients to communicate in a more patient and community centered way about experiences with chronic back pain.

Keywords

Pain Assessment Tools, Chronic Musculoskeletal Pain, Indigenous Perspectives, Community-Engaged Research, Culturally Responsive Care

Walid Maraqa

BIO

Walid Maraqa is a graduate of the MSc in Biostatistics program (2022) at the Dalla Lana School of Public Health, University of Toronto (Canada). He received his BSc in Mathematics (2021) with a focus in probability and statistics at the University of Toronto. His MSc practicum project with Dr. Osvaldo Espin-Garcia and Dr. S. Amanda Ali focused on longitudinal k-means clustering and cluster scoring methods. The project aimed to identify distinct clinical subgroups in osteoarthritis progression using clinical measures and patient self-assessments associated with osteoarthritis. He is interested in probability theory, unsupervised learning, and developing phenotyping methods.



Plain language summary:

With a less biased longitudinal approach to identifying various progression subgroups in osteoarthritis, our hope is to elucidate the strongest factors underlying these subgroups. This could offer a new foothold in OA phenotyping, perhaps leading to improved radiographic OA grading or better methods of obtaining patient-reported symptoms. For individuals with OA, this could mean better pain and disability management based on the trajectory associated with their subgroup, or even knowing in advance if they are likely to require joint replacement, which could significantly reduce disease burden.

Keywords

Osteoarthritis Initiative, OAI, osteoarthritis, clinical subgroups, clustering algorithms, k-means clustering, phenotyping, longitudinal data

Y. Raja Rampersaud

BIO

Dr. Rampersaud is a leader in surgical outcomes, safety and health services research in Orthopaedic surgery. His research is particularly aimed at improvements in the delivery and outcomes of patient centered spine and musculoskeletal care. He is an advocate for interprofessional models of care and has developed an Inter-professional Spine Assessment and Education Clinic (ISAEC) program which has been provincially implemented as the Rapid Access Clinics – Low Back Pain Pathway. He is a past president of the Canadian Spine Society. He is also a founding member and current Chair for the Canadian Spine Outcomes and Research Network (CSORN).



Plain language summary:

Joint replacement and spinal decompression surgeries are commonly performed in North America. The study had 1,175 participants who had hip or knee replacements or spinal decompression surgery. A cost-utility ratio was calculated using the average cost of treatment and the average improvement in patient health after one year. A comparison of these ratios between patients who responded well to the surgery and patients who did not indicates that surgeries performed on patients who did not respond well were not cost effective. Identifying these patients before surgery will be beneficial.

Keywords

Cost-Efficacy ;Surgery ;Patient Reported Outcomes ;Responder

Zoya Qaiyum

BIO

Zoya Qaiyum is a research technician at the Inman laboratory, Schroeder Arthritis Institute, University Health Network, Toronto Ontario. Her work in basic science research investigates the biological pathways linking gut and joint inflammation in axial spondyloarthritis (axSpA). She is also keenly involved in health services research, employing various econometric analyses, to understand how factors at the patient and system level impact axSpA quality-of-life.

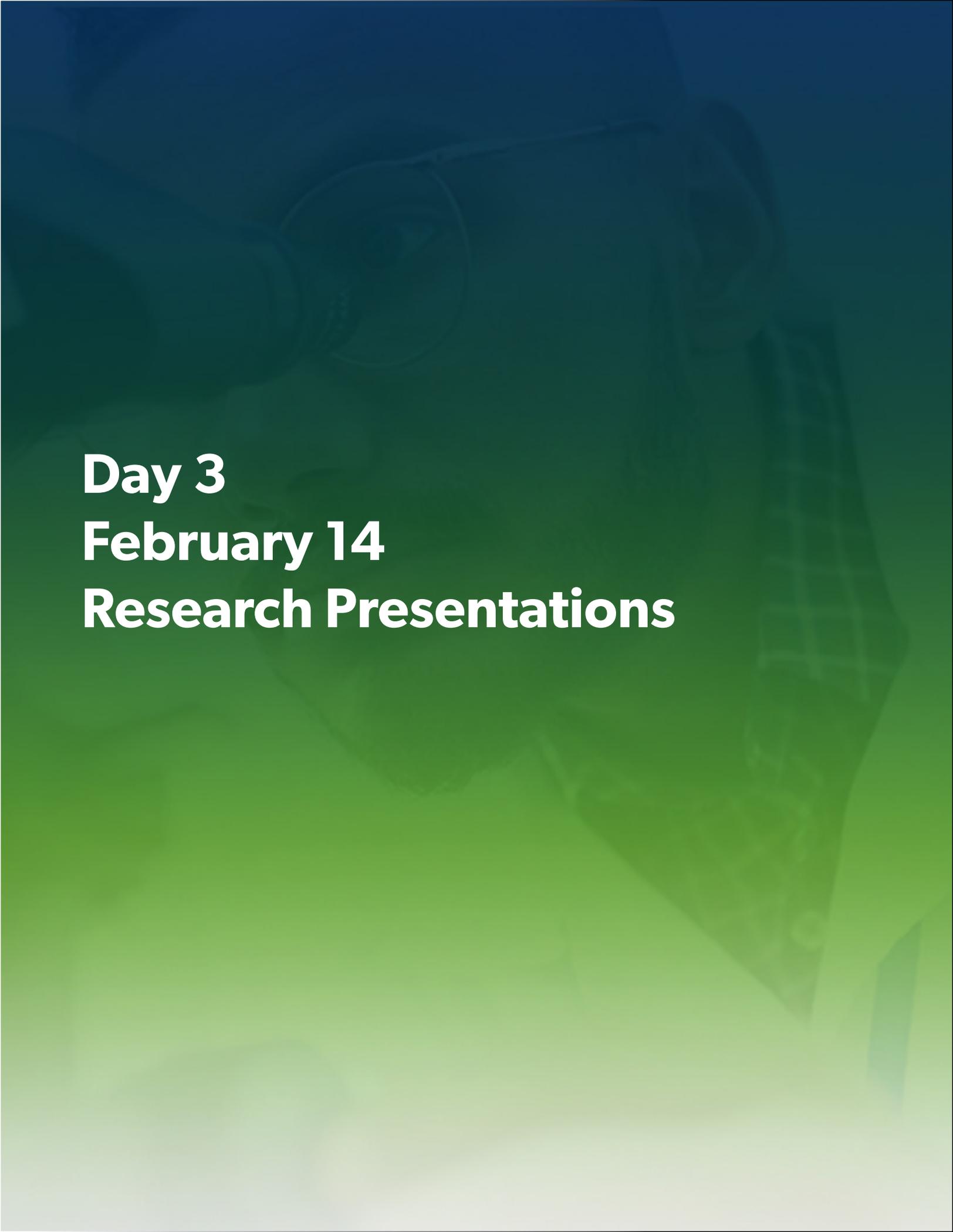


Plain language summary:

This project focused on factors affecting physical and mental health of axial spondyloarthritis (axSpA) patients. Delays in diagnosing axSpA led to declining physical and mental health. Patients' physical health worsened if patients had other health conditions such as hypertension or diabetes. Mental health worsened if patients had psoriasis. Unemployed patients had poorer physical and mental health. These findings warrant more frequent monitoring of health at home or clinics. Also, intervention programs that aim to reduce diagnosis delays and withdrawal from the work force are necessary.

Keywords

Axial spondyloarthritis, quality-of-life, diagnostic delay



Day 3
February 14
Research Presentations

Listed in alphabetical order by first name

Aaron Howe

BIO

Aaron Howe is a graduate student in Clinical Psychology at Columbia University. He has a history of clinical research experience in projects investigating sociodemographic, genetic, and epigenetic mechanisms of psychopathology in clients with mental health concerns. Currently, he is a research analyst with the ReSTORE lab at the University of Toronto working on qualitative research related to the intersectional lens of occupational health and health-related quality of life in individuals with chronic disease and those with exposure to acute, repeated workplace related stressors.



Plain language summary:

This study interviewed lupus patients regarding problems with cognition, such as memory, attention, planning and language to better understand the impact of this on day-to-day living and life participation. Five main themes were identified; definitions of cognitive problems in lupus, reasons for cognitive problems, the impact of cognitive problems on life, life adaptations to cognitive problems and how these adaptations affect daily living. By further understanding these problems from the patient perspective we can better design future research studies and ultimately treatment options.

Keywords

Systemic lupus erythematosus; qualitative interviews; life participation; cognition; activity adaptations

Alexandra Legge

BIO

Alex Legge is an adult rheumatologist and Assistant Professor of Medicine at Dalhousie University in Halifax, Nova Scotia, where she is also the director of the Dalhousie Lupus Clinic. She completed her medical school and residency training at Dalhousie University, as well as a Master of Science degree in Community Health & Epidemiology in 2018. Following residency, she completed a one-year research fellowship at Arthritis Research Canada in Vancouver, British Columbia under the supervision of Dr. Diane Lacaille. Her research interests include the impact of frailty on health outcomes among individuals living with rheumatic diseases.



Plain language summary:

Frailty defines a state of increased vulnerability with decreased ability to response to health challenges. Frailty may be an important predictor of health outcomes in rheumatoid arthritis (RA). Using health data for all RA patients in British Columbia, we created a frailty index (FI), whereby higher FI scores indicate greater frailty. We found that RA patients with higher FI scores early in their disease had a higher risk of death and higher rates of ER visits and hospital admissions during follow-up. The FI is a promising tool for studying the impact of frailty on individuals living with RA.

Keywords

Frailty, rheumatoid arthritis, administrative health data, hospitalizations

Charmaine van Eeden

BIO

Dr. Charmaine van Eeden is currently a research associate in the Department of Medicine at the University of Alberta. Her research focuses on trying to uncover the mechanisms underpinning the development of chronic fatigue in systemic autoimmune rheumatic disease (SARD) patients. Specifically, she has identified a pattern of mitochondrial dysregulation, that can distinguish SARD patients with chronic fatigue, from patients without fatigue. Her aim is to identify potential biomarkers, which may be useful in guiding future clinical interventions for SARD patients suffering from chronic fatigue.



Plain language summary:

Patients with autoimmune diseases often develop symptoms of severe tiredness and memory problems reminiscent of myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS). These symptoms persist even when their disease appears well-controlled. We found that the mitochondria in patients suffering from ME/CFS and scleroderma or vasculitis, are less functional and the cells carrying them weaker. We hope this finding may lead to the development of more targeted diagnostic and treatment strategies for fatigue, improving care for rheumatic disease patients suffering from fatigue.

Keywords

Systemic sclerosis, ANCA vasculitis, fatigue, mitochondrial dysregulation

Ermina Hadzic

BIO

I am in my second year of PhD studies in Dr. Frank Beier's lab at Western University, Ontario, Canada. My main research focus is examining the role of the Mig6/EGFR pathway in osteoarthritis and its potential as a therapeutic target. My work involves cell work, genetically modified mouse models, and surgically-induced OA.



Plain language summary:

Osteoarthritis (OA) is the most common form of arthritis and lacks a cure. There has been a lot of work done to identify a drug target, and it seems that a protein called Mitogen-inducible gene 6 (Mig6) could be a good candidate. Previous work in our lab showed that Mig6 may lead to increased cartilage growth, which is helpful. We also found more bone spurs, so in this work we looked at how another protein, TGF α , plays a role to see if we could achieve cartilage growth without bone spurs. It appears that TGF α does not affect the Mig6-induced bone spurs, so we need to examine other proteins.

Keywords

Osteoarthritis ; cartilage ; EGFR signalling ; Mitogen-inducible gene 6

Hayley Peters

BIO

Hayley Peters completed her undergraduate degree in Life Sciences at the University of Toronto. She is now undertaking a master's degree within the Laboratory Medicine and Pathobiology department at the University of Toronto. She is researching under Dr Mohit Kapoor at the Schroeder Arthritis Institute within the University Health Network in Toronto. Hayley's research focusses on osteoarthritis within the knee and the effects of the infrapatellar fat pad and obesity on the pathology of this disease. In her free time, Hayley enjoys reading, vegetable gardening and going to the gym.



Plain language summary:

Currently, cell types within the infrapatellar fat pad and their contribution to OA is not well defined. Utilizing single-nucleus RNA sequencing, we discovered major cell populations within the IFP including fibroblasts, adipocytes, and macrophages as well as distinct cell subtypes. Further investigation will be completed to characterize the function of identified cell subtypes. Dissecting the role of fat pad will help understand the OA pathogenesis and will help us better understand the OA disease process.

Keywords

Osteoarthritis, knee, knee osteoarthritis, obesity, single nucleus RNA sequencing, fat pad, infrapatellar fat pad, cell types, cell populations, bioinformatics

Jeffrey Hutchinson

BIO

I am a fourth year PhD student in the department of Physiology & Pharmacology at the University of Western Ontario. I study the intervertebral disc, the cartilaginous joint between bones of the spine. Degeneration of this tissue through aging or injury is often associated with low back pain, the leading cause of years lived with disability in developed countries. Despite high prevalence and huge socioeconomic costs, there are no disease modifying treatments. I am currently exploring the role of steroid hormones on disc biology based on clinical observations of changes in disc height and pain measures after steroid use.



Plain language summary:

The Global Burden of Disease study reports back pain as the most common cause of disability, with a lifetime prevalence over 80% in Canada. Though complex, it is often associated with intervertebral disc (IVD) degeneration. Despite the high prevalence, there are no disease-modifying treatments. Injection of steroid and growth hormones is being used clinically to treat back pain based on a case study that reported decreased back pain, but no studies have investigated their effect. Our goal is to understand the role of these hormones in the IVD, and their potential as a novel therapeutic.

Keywords

Steroids, intervertebral disc, cell biology, nucleus pulposus, annulus fibrosus, murine, bovine, cell culture, back pain, spine

Joo Eun (June) Kim

BIO

June is currently a second-year master's student at McGill University, working under the supervision of Dr. Anastasia Nijnik in the Department of Physiology. She first moved from Toronto to Montreal for her Bachelor of Science degree in the Honours Physiology program at McGill University. Her research project looks at investigating the immunophenotype unique to interstitial lung disease in the context of systemic autoimmune rheumatic diseases. When June is not conducting 12-panel flow cytometry experiments, she enjoys brewing a nice hot cup of coffee and running as she is preparing to run her very first half marathon in May.



Plain language summary:

Interstitial lung disease (ILD) is a common manifestation of rheumatoid arthritis (RA) and is a major cause of morbidity and premature mortality in RA patients. How ILD occurs in RA patients is poorly understood and it remains impossible to identify patients that will go on to develop ILD. My research works with both patient blood samples and relevant animal models to better understand properties associated with ILD progression in RA as well as other systemic autoimmune rheumatic diseases. These findings will contribute to improved prediction and treatment of inflammatory diseases such as RA.

Keywords

Rheumatoid arthritis, autoimmunity, inflammation, lung, flow cytometry, immunology, blood, mouse models

Kristine Godziuk

BIO

Kristine is a postdoctoral research fellow in the Department of Agricultural, Food and Nutritional Sciences at the University of Alberta, supported by an Alberta Innovates Fellowship in Health Innovation. Her research aims to improve health outcomes and health service delivery for individuals with osteoarthritis and obesity or a large body size (defined as a BMI ≥ 35 kg/m²). She is currently leading a pilot randomized clinical trial [POMELO: Prevention Of MusclE Loss in Osteoarthritis] funded by the Arthritis Society, and examining the relevance of sarcopenic obesity in chronic disease management. Kristine has a PhD in rehabilitation science, and an extensive clinical background as an exercise physiologist in bariatric and occupational health settings.



Plain language summary:

The POMELO study examines a personalized exercise and nutrition program for individuals with knee osteoarthritis and a larger body size. We aimed to assess how many study participants have a hidden health condition of low muscle mass and low strength (called sarcopenic obesity) at baseline. This condition impacts quality of life and mobility. We used grip strength, sit-to-stands, and body composition assessment to determine how common this condition is in this patient group. Early identification of sarcopenic obesity may help improve arthritis treatments and patient outcomes.

Keywords

Sarcopenia, obesity, osteoarthritis.

Lauren Banh

BIO

Lauren Banh is a PhD student in the Institute of Biomedical Engineering at the University of Toronto (UofT). She is supervised by Dr. Sowmya Viswanathan (University Health Network) and co-supervised by Dr. Edmond Young (UofT). Lauren is developing a “joint-on-a-chip” for osteoarthritis studies.



Plain language summary:

Osteoarthritis, a debilitating condition that affects the joint, remains a disease that lacks effective treatments despite extensive research over the years. This is partly due to the lack of scientific models that can accurately represent the complex human joints. To address this issue, we are building a more realistic joint model using the most recent microfluidic cell technology. Our model, termed “joint-on-chip”, will be a powerful tool for osteoarthritis researchers to better understand the disease. Moreover, our model can be translated for drug testing purposes and to tailor medicine to e

Keywords

Organ-on-a-chip, joint-on-a-chip, cartilage mechanobiology, osteoarthritis

Lauren Straatman

BIO

Lauren Straatman is a PhD Candidate in Rehabilitation Science at Western University. Lauren’s thesis is a collaborative project that spans both rehabilitation sciences and mechanical engineering, under the co-supervision of Dr. David Walton and Dr. Emily Lalone. The transdisciplinary nature of Lauren’s work stems from her goal of bridging the gap between health research and engineering. The main focus of her thesis is to explore biomarkers underling chronic pain, functional disability, and osteoarthritis. Lauren’s most recent work explores the relationship between joint loading and subchondral bone, to elucidate key factors that may contribute to OA initiation and progression.



Plain language summary:

There are currently no treatment options to reverse arthritis, therefore we need to take early action to prevent it. However, we can’t prevent arthritis if we don’t know how the disease develops. When a joint is injured, arthritis is likely to develop within 5 - 10 years. Initially, it was suspected that arthritis developed following injury because of the mal-alignment in the joint. However, we believe that bone tissue changes following injury precede that of cartilage degeneration in the joint, and may therefore allow for timely rehabilitative strategies to decrease the progression of OA.

Keywords

Wolff’s Law; Subchondral bone; joint contact; bone mineral density; early osteoarthritis; joint remodeling

Mozhgan Rasti

BIO

I have a Ph.D. and extensive knowledge and experience in the areas of molecular biology and biochemistry. I joined the Schroeder Arthritis Institute in 2019. I am studying the osteoarthritis (OA) synovial fluids (SF) properties and how it polarizes peripheral monocytes. I have worked on polarization of CD14+ primary cells with small molecules, proteinase-mediated macrophage signalling in psoriatic arthritis. In this area I am investigation the role of IL6 signaling in OA SF monocyte/macrophages and mesenchymal stromal cells interactions with monocyte/macrophages in osteoarthritis.



Plain language summary:

To explore the cause of inducing inflammatory macrophage in osteoarthritis joints. We are investigating molecular mediators of M s activation/polarization in arthritic joints focusing on signaling pathways that are involved in inflammation. Our finding shows there are anti and pro-inflammatory mediators for macrophage polarization. We found that IL6 that increases during the inflammatory stimulation in OA joints, polarizes macrophages into anti-inflammatory macrophages. However, S100A8/9 increase in OA joint block the anti-inflammatory effect of IL6. We concluded that the fate of macrophages

Keywords

IL6 signaling, synovial fluid, mesenchymal stromal cells

Nada Abughazaleh

BIO

My name is Nada Abughazaleh. I am a Ph.D. student from the University of Calgary Department of Biomedical engineering. I have a bachelor's degree in biomedical engineering from The Hashemite University in Jordan. I came to Canada in 2010 and earned a master's degree in biomedical engineering. During my master's, my research focused on determining the effect of different types of exercise on chondrocyte viability and cartilage degeneration and Osteoarthritis. My work has been published in Clinical biomechanics journal. Currently, I am working in the Human performance lab at the University of Calgary under Dr. Walter Herzog's supervision to identify the effect of obesity and the associated systemic inflammation and imbalance in the microbial community with musculoskeletal degeneration and a specific phenotype of osteoarthritis in male and female rats.



Plain language summary:

Obesity is a major risk factor for developing Osteoarthritis (OA), Feeding male rats a diet high in fat and sugar leads to knee joint degeneration. In this study we are trying to evaluate how female rats respond to consuming a diet high in fat and sugar by assessing the changes in weight, fat mass, and blood sugar and lipid levels then compare it to the previous model of male rats. Understanding how each sex respond to this type of diet will help us design interventions customized for each group in an attempt to protect or at least slow down the progression of OA .

Keywords

Obesity, Metabolic OA, Female rats, Lipid profile, Body fat

Pavlos Bobos

BIO

Pavlos Bobos is an Assistant Professor (tenured track) in musculoskeletal health at Western University. Dr. Bobos received training in physical therapy and clinical epidemiology. Professor Bobos' research themes include the development and evaluation of mobility and activity interventions, clinical measurement methods and innovations and the identification of best practices using evidence synthesis. His clinical experience is in the field of musculoskeletal health with a focus on exercise, activity modification and complex multimodal interventions that improve physical and mental health in people with chronic pain particularly osteoarthritis.



Plain language summary:

Effective pain relief and maintenance of physical function are the primary objectives of exercise treatments for OA. However, existing exercise programs, present inadequate information in the implementation of the recommended exercises for people with knee and hip osteoarthritis. To address this, we combined the accumulated evidence from the high quality randomized trials available in the literature in a network meta-analysis to determine which exercise modalities in knee OA appear to have the greatest impact, and develop a new intervention package of effective exercise programs.

Keywords

Osteoarthritis, exercise, musculoskeletal, evidence synthesis, pain, network meta-analysis

Rochelle Furtado

BIO

Rochelle Furtado is a physiotherapy student and PhD candidate in the Health and Rehabilitation Sciences Program at Western University in London, Ontario. Rochelle's doctoral thesis is focused on a pre-rehab and education program for a total shoulder replacement surgery. She is currently supported by a Frederick Banting and Charles Best Canada Graduate Scholarships – Doctoral Award (CGS-D) awarded by the Canadian Institutes of Health Research and the Bone and Joint Transdisciplinary Award.



Plain language summary:

Total shoulder replacements are a standard operative treatment for shoulder osteoarthritis. However, there is a lack of research regarding pre-surgery education programs for shoulder replacements. Further, patients' perspectives are not included when making these programs. Our goal was to interview both patients and clinicians to understand their perspectives for these programs. Interim results support the use of a web-based exercise and educational program with supplemental reading material. These findings will now inform the creation of a future program for shoulder OA patients.

Keywords

Shoulder osteoarthritis, virtual rehabilitation, patient education, total joint replacements

Yvonne Lee

BIO

Yvonne Lee is a PhD candidate at the University of Toronto. She is also a registered physiotherapist and has worked in outpatient, acute, and rehab settings. Yvonne is currently conducting research at SickKids' Child Health Evaluative Sciences program. Her research interests include clinical trial designs, applications, and outcome measurements for exercise intervention research studies.



Plain language summary:

Children with Pediatric Rheumatic Diseases (PRDs) often don't have the ability to exercise as much as their peers. Although exercise training can improve physical fitness and energy to do more activities, we don't know the best exercise training program for these children. This project aims to understand the features of effective training programs based on current research. We also make suggestions for researchers to better design training programs. This is an important step toward creating guidelines for children with PRDs to improve their fitness, participation in life, and quality of life.

Keywords

Childhood arthritis, juvenile arthritis, pediatric rheumatic diseases, exercise interventions

Zhiyao Ma

BIO

Hilda Ma was trained as a biomedical engineer in Hong Kong and completed her master's degree in the same major at the RWTH Aachen University in Germany. She is currently a PhD student in the department of surgery under the supervision of Dr. Adetola Adesida. Her research topic is using tissue engineered constructs as models to study the molecular mechanism of osteoarthritis in a simulated microgravity environment.



Plain language summary:

The prevalence and severity of KOA are disproportionately higher in females and sex hormones alone do not fully account for the disproportionate incidence of KOA. The molecular mechanisms regulating the pathogenesis of KOA are poorly understood. The aim of this study is to investigate the sex-dependent gene expression profile of human meniscus models exposed to short-term simulated microgravity.

Keywords

Knee osteoarthritis, sex differences, human meniscus models, simulated microgravity, transcriptome profiling