SCIENCES CHIRURGICALES ET INTERVENTIONELLES SURGICAL AND INTERVENTIONAL SCIENCES

Centre universitaire de santé McGill Institut de recherche

McGill University Health Centre Research Institute

SURGICAL AND INTERVENTIONAL SCIENCES GRADUATE PROGRAM RESEARCH DAY 2024

May 23rd, 2024 - 8AM – 9:30PM EST

McGill's Thomson House, 3650 McTavish Street, Montreal, Quebec H3A 1Y2

https://www.mcgill.ca/surgicalandinterventionalsciences/
https://rimuhc.ca/research/programs/surgical-interventional-sciences

2024 Research Day
Thursday May 23, 2024
In person

Research has been a common thread running through all kinds of professions and pursuits, from Ancient Rome right up to the present day. We continue this tradition in the Department of Surgical and Interventional Sciences at McGill University, always dedicated to finding new knowledge and ideas that can ultimately lead to better clinical care. Research Day is an opportunity for trainees (medical students, residents, graduate students, fellows, and post-doctoral fellows) to present their research to the rest of the department and research program. Each year the program includes oral and poster presentations by trainees.

We are pleased to announce that the Surgical and Interventional Sciences Research Day 2024 will be held on **Thursday, May 23, 2024**, from 8:00am (registration) until 9.30pm at McGill's Thomson House, 3650 McTavish Street, Montreal, Quebec H3A 1Y2.

Please note that Thomson House does not have a parking lot, nor is there street parking on McTavish. It may be possible to arrange to use 1 or 2 spots in our driveway, depending on the date and time of the event, typically for organizers with materials to be brought in and/or guests with mobility restrictions. For other guests you may be able to make arrangements with McGill parking services to gain access to the lot just below Thomson House, as well there is a paid lot located at the corner of de la Montagne and Dr. Penfield. For more information you can check out the McGill Parking website at https://www.mcgill.ca/transport/parking/downtown/visitors.

If you have any questions regarding the event, please contact Ms. Sharon Turner at gradstudies.surgery@mcgill.ca

Instructions for student presenters: Your presentation should be no more than 5 min. in length for podium talks (followed by 3 min. Q&A) and no more than 3 min. in length for posters (followed by 2 min. Q&A).

We are asking all oral presenters to send their slides no later than **May 20, 2023**, to Sharon Turner at gradstudies.surgery@mcgill.ca.

The Research Day Organizing Committee:

Professor Fackson Mwale, PhD, SIS Graduate Program Director
Professor Jake Barralet, PhD, SIS Associate Program Leader
Muskan Alad, PhD c, President SIS Graduate Student Society
Pegah Rahimizadeh, PhD student, SIS Graduate Student Society
Micha Huynh, SIS Program Administrator
Sharon Turner, SIS Graduate Program Coordinator
Laura Epure, Eng, MSc, SIS Student Affairs Coordinator
Anne Mathiot, SIS Program Manager RIMUHC
Janae Palmer, SIS Program Assistant RIMUHC
Terry Ng Wan, Chief Multimedia Technician

The Surgical and Interventional Sciences Graduate Program extends special thanks to our abstract, oral presentation, and poster judges.

Dr. Liane Feldman (PI)
Dr. Fackson Mwale (PI)
Dr. Anie Philip (PI)
Dr. Lisbet Haglund (PI)
Dr. Julio Fiore Jr. (PI)
Dr. David Labbé (PI)
Dr. Renzo Cecere (PI)
Dr. Sampath Loganathan (PI)
Dr. Wassim Kassouf (PI)
Dr. Cristian O'Flaherty (PI)
Dr. Swneke Bailey (PI)
Dr. Joanna Przybyl (PI)
Dr. Jaques Lapointe (PI)
Dr. Maria Petropavlovskaya (PI)
Dr. Nicoletta Eliopoulos (PI)
Dr. Amir Hooshiar (PI)
Dr. Rahul Gawri (PI)

Dr. Nadia Boufaied (Research Associate)
Dr. Kenneth Finnson (Research Associate)
Karl-Philippe Guerard, MSc (Research Associate)
Dr. Eva Michaud (Postdoc)
Dr. Richard Miallot (Postdoc)
Dr. Amani Hassan (Postdoc)
Dr. Geoffroy Danieau (Postdoc)
Dr. Orçun Haçariz (Postdoc)
Muskan Alad (PhD Candidate)
Pegah Rahimizadeh (PhD Candidate)
Laura Epure, Eng, MSc (Research Associate)
Michael Grant, PhD (Research Associate)
Philippe Jolivet, BSc (Lab Manager)

We would like to extend our gratitude to our sponsor, whose generous support has played an important role in making this event possible.

Keynote Speaker

Scott Dulchavsky, MD, PhD

Innovation Committee Chair
Henry Ford Innovation Institute CEO and NASA Principal Investigator

Dr. Dulchavsky is currently a professor of surgery, molecular biology and genetics at Wayne State University School of Medicine and Michigan State University. He serves as the Roy D. McClure Chairman of Surgery and the Surgeon in Chief at Henry Ford Health System in Detroit, Michigan. He is the founder and CEO of the Innovation Institute at Henry Ford. He founded several successful companies in the medical device and software industry and manages multiple innovation grants.

Dr Dulchavsky is a principal investigator for NASA: his research investigates the long-term effects of microgravity on human physiology on astronauts/ cosmonauts on the International Space Station and for exploration class spaceflight. This work has been modified for use on the Earth where his team supports on-site care of professional sports teams, the United States Olympic Committee and other worldwide organizations to support maternal care in over 60 countries.

He maintains an active role in local and National medical associations including the American College of Surgeons where he is the Vice Chair for Technology and Research. He has served on the White House Medical Team to provide regional care for the President of the United States.

Title of Presentation: EXTRA-TERRESTRIAL MEDICAL CARE

There has been a continuous human presence in space for over 2 decades. The provision of medical care in remote or extreme environments including space is challenging secondary to limited availability of trained personnel, resource constraints, cost, and communication delays. The International Space Station, and soon a lunar outpost requires thoughtful approaches to allow planned or urgent medical care to be provided using novel approaches. A number of medical innovations have been developed to support the space program: fortunately, these unique test environments and constraints require solutions that also have terrestrial applicability in resource constrained areas in Canada, the US, and our world.

Novel advances in telemedicine, remote sensing, telementoring, just in time training, and autonomous medical care techniques allow our crewmembers to conduct low Earth orbit, and soon exploration class spaceflight with appropriate medical care capabilities. Many of the lessons learned in space medicine have and can be transitioned to improve care back on our planet.

Invited Speakers

Alan J. Forster MD, FRCPC, MSc

Director, Innovation, Transformation, and Clinical Performance at the McGill University Health Center
Professor for Health Innovation, McGill University.

Alan J. Forster is the Director, Innovation, Transformation, and Clinical Performance at the McGill University Health Center and the McGill University Professor for Health Innovation.His focus is enabling teams to create higher value health care – in which patient outcomes are realized and health system costs are lowered.

Over his career, he has led local, national, and international efforts to improve healthcare quality. His research programs have contributed to over 240 publications in peer review journals and innumerable advances in quality. Lasting contributions include his impact on the development of a model for learning health systems leveraging healthcare data.

In recognition of his contributions, he was listed as one of Canada's top 10 healthcare power brokers by Maclean's Magazine in April 2023 and named to the International Society for Quality in Healthcare's International Academy for Quality and Safety in Healthcare in July 2023.

Title of Presentation: IS A HOSPITAL BASED INNOVATION PROGRAM NECESSARY?

Guillermo Rocha, MD, FRCSC, FACS

Chair of the Department of Ophthalmology and Visual Sciences, FMHS, McGill University

Guillermo Rocha, MD, FRCSC, FACS is originally from Mexico City, Mexico. He trained in Ophthalmology at McGill University in Montreal and has completed subspecialty training in Ocular Immunology and Inflammation, and Cornea and External Diseases. He completed the Physician CEO Executive Program at the Kellogg School of Management (2016) and the Foundations of Clinical Research Certificate Program, Harvard Medical School (2022).

He is Professor and Chair, Department of Ophthalmology & Visual Sciences at McGill University and Chief, Division of Ophthalmology at MUHC in Montréal, Canada, President of the COS Foundation, Past President of the Canadian Ophthalmological Society (2016-2018), and past President of the Canadian Cornea, External Diseases and Refractive Surgery Society.

In 1995, he was awarded the Canadian Society for Clinical Investigation & Medical Research Council of Canada Resident Research Award for his work on the causative factors of ocular inflammation. Dr. Rocha was the recipient of the Lieutenant Governor of Manitoba iCare Award for 2014. In 2015, he was recognized as one of the 10 Most Successful Mexicans in Canada, followed by an award as one of the 10 Most Influential Hispanic Canadians in 2016. Dr. Rocha performs Anterior Segment, Refractive and Corneal Surgeries.

Title of Presentation: DESIGNER SURGERY OF THE CORNEA

This presentation will review the current innovations in the concept of "designer corneal surgery", contrasting basic techniques with advanced technology; the use of simple biologicals vs. genetic approaches to corneal transplantation and the development of customized laser approaches to enhance visual recovery in our patients.

Márquez Fosser Santiago MD, MSc

Dr. Márquez Fosser Santiago is a Physician and Clinical Informatics Specialist known for his expertise in facilitating data access for research at the RI MUHC. With an MD and a Master's degree, he plays a crucial role in Health Informatics, serving as a dedicated specialist at RI MUHC and consultant at MUHC Infocentre Group.

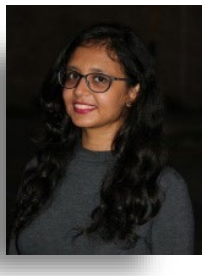
He is committed to advancing healthcare through data-driven insights and helping researchers have access to vital hospital datasets. He excels in navigating the complex process of accessing and utilizing datasets, supporting precise and effective investigations. At the core of Dr. Marquez's work is his adept use of the MUHC Data Warehouse, a valuable clinical and administrative data repository. He also integrates external synthetic data sources like MDClone-Sheba to expand research possibilities and innovate in healthcare analytics.

Title of Presentation: Unleashing Data Insights: Transforming Healthcare with MDClone's ADAMS Platform

In this talk, we will delve into the transformative capabilities of MDClone's ADAMS Platform, revealing how healthcare institutions can harness data insights to revolutionize patient outcomes and operational efficiencies. MDClone serves as a catalyst for collaboration and analysis that balances patient privacy with innovative features such as dynamic data exploration and synthetic data generation. Furthermore, we will explore the vital process of accessing synthetic data at Sheba, highlighting its pivotal role in propelling research and innovation and driving unparalleled innovation in secondary data use.

Muskan Alad (PhD Candidate)

President SIS/ESGSS



Pegah Rahimizadeh (PhD Candidate)

Vice president Academic SIS/ESGSS

Title of Presentation: Surgical and Interventional Sciences (SIS/ESGSS) Council Presentation

AGENDA

8:00-11:00	**Registration**
9:00 – 9:15 am	**OPENING REMARKS** **Liane Feldman, MD CM, FACS, FRCS**, Edward W. Archibald Professor and Chair of the Department of Surgery, Surgeon-in-chief, Department of Surgery, MUHC **Ed Harvey, MDCM , MSc, FRCSC, FiOTA, FAAOS**, Director SIS Program, RIMUHC
9:15 am	**KEYNOTE SPEAKER** **Scott Dulchavsky, MD, PhD**, Surgeon in Chief, Henry Ford Health, CEO of Henry Ford Innovations, Principal investigator for NASA **Title: EXTRA-TERRESTRIAL MEDICAL CARE**
10:00-10:15	**Coffee Break**

Session 1: Basic Sciences 10:15 – 11:30 Steering chair: Dr Anie Philip & Tarek Klayat	
10:20-10:35 am	**Surgical and Interventional Sciences Student Council (SISGSS/ ESGSS)** Muskan Alad, President, and Pegah Rahimizadeh Vice President Academic
10:35 – 10:45 am	**Lipid-based dietary intervention strategies to enhance DNA damaging therapies in castration-resistant prostate cancer.** Tianrui Xu, MSc student
10:45 – 10:55 am	**Are RORγ+ neutrophils a suitable therapeutic target in gastroesophageal adenocarcinoma?** Iqraa Dhoparee-Doomah, PhD student
10:55 – 11:05 am	**Regenerative approaches to treat disc degeneration and low back pain.** Saber Ghazizadeh, PhD student
11:05 – 11:15 am	**Expression of miRNA has-miR-7977 as a Predictive Biomarker Associated with Response to Gemcitabine and Docetaxel in Leiomyosarcoma** Pegah Rahimizadeh, PhD student
11:15 – 11:25 am	**Differentiating Human Bone Marrow and Adipose-derived Stem Cells Towards Ligamentogenic Lineage Using Physiological Oxygen Tensions for Tissue Engineering Applications** Tarek Klaylat, PhD student

11:30 – 13:00	**Lunch & CAREER FAIR** Femtherapeutics Biomomentum MDClone DCAT and CAPS

SESSION 2 – Outcomes 13:00 – 14:15 Steering chair: Dr Jacques Lapointe and Dr Richard Miallot	
13:05 – 13:25	**INVITED SPEAKER** **Santiago Márquez Fosser MD, MSc** **Title: Unleashing Data Insights: Transforming Healthcare with MDClone's ADAMS Platform**
13:25 – 13:35	**Uncovering Patient Sensitivity to Doxorubicin using Donor-Derived Cardiomyocytes** Ludovic Mouttet, MSc student
13:35-13:45	**Predictors of in-hospital opioid consumption and discharge prescribing following cesarean delivery.** Katy Dmowski, MSc Student
13:45-13:55	**Usability of the Patient Generated Index (PGI): Insights from Children, Young People, and Clinicians in the Context of the Long-term Follow-up of Esophageal Atresia** Zanib Nafees, PhD Student
13:55-14:05	**Cost-Effectiveness of Olaparib Vs. Rucaparib for Patients With Metastatic Castration-Resistant Prostate Cancer – The Canadian Perspective** Ivan Yanev, PhD student
14:05-14:15	**Enhancing Precision for Soft Surgical Robots using Bi-level Autoencoder-based Control** Alireza Zahedi, MSc student

14:15-14:35	**TOWN HALL** **Alan Forster, MD, MSc -** Director of Innovation, Transformation and Clinical Performance at the McGill University Health Centre (MUHC) and the Research Institute of the MUHC (RI-MUHC). **Title of Presentation: Is a hospital-based innovation program necessary?**

14:35- 14:50	**Break**

SESSION 3: Clinical 14:50 – 16:00 Steering chair: Dr Jonathan Cools-Lartigue and Mahshid Mortazav	
14:55-15:15	**INVITED SPEAKER** **Guillermo Rocha, MD, FRCSC, FACS**, Professor and Chair, Department of Ophthalmology & Visual Sciences at McGill University and Chief, Division of Ophthalmology at MUHC **Title: DESIGNER SURGERY OF THE CORNEA**
15:15-15:25	**AZGP1: A Potential Prognostic Biomarker in Prostate Cancer** Shreya Udupa, Med Student
15:25-15:35	**The Impact of Adjunct Medical Therapy on Survival After Spine Metastasis: A Systematic Review and Pooled Data Analysis** Jonathan Hubermann, MSc Student
15:35-15:45	**Reimagining Hospital Care with Young Voices: The Power of Play and Theatre** Yi Wen Wang, PhD student
15:45-15:55	**Comparative Analysis of Equipment-Free Tasks for Biomechanical Assessment: Identifying Optimal Replacement of Drop Vertical Jump in Evaluating ACL Injury Risk** Danielle Schutt, MSc student
15:55-16:05	**Harassment in Medical Education: A Psychophysiological Perspective through the Analysis of Electrodermal Activity** Negar Matin, MSc student
16:05-16:10	**CLOSING REMARKS** **Fackson Mwale PhD, FIOR,** SIS Graduate Program Director, Surgical and Interventional Sciences, Professor of Surgery, McGill University

16:15-17:15 17-30-1830	- **Poster session 1** - **Poster session 2**	**Cocktail (Starts at 5pm)**

18:45	**Banquet and AWARDS**

ABSTRACTS

ORAL PRESENTATIONS

Lipid-Based Dietary Intervention Strategies to Enhance DNA Damaging Therapies in Castration-Resistant Prostate Cancer

Tianrui Xu[1,2], Walaa Alahmadi[1,2], Maria Celia Fernandez[2], Nadia Boufaied[2], David P. Labbé[1,2,3]

[1]Division of Experimental Medicine, Department of Medicine, McGill University;
[2]Cancer Research Program, Research Institute of the McGill University Health Centre;
[3]Division of Urology, Department of Surgery, McGill University

INTRODUCTION: Castration-resistant prostate cancer (CRPC) remains a significant global health concern, with 4,900 men in Canada, and this represents 10% of all cancer deaths in men this year. c-Myc (MYC) is one of the major drivers of prostate cancer (PCa) tumorigenesis and progression, and its overexpression in early and metastatic PCa are related to poor survival rates. Precision nutrition has been shown as a promising approach to inhibit tumour growth, and the therapeutic benefits of dietary interventions in CRPC have not been extensively investigated. Our previous research has demonstrated that short-term high fat diet (sHFD) results in increased DNA damage in castration-sensitive prostate cancer (CSPC) models and potentiates the efficacy of radiotherapy. Importantly, we have found that HFD-associated ceramides in circulation are driving DNA damage. CSPC responds to androgen deprivation therapy (ADT), which reduces circulating androgens by primarily inhibiting testosterone production. Additionally, previous study has shown the crosstalk between androgen receptor and DNA damage response signaling pathways. Short term HFD was sufficient to induce DNA damage in MyC-driven subcutaneous model. Therefore, it remains unclear if the radiotherapy sensitization will be maintained in CRPC settings. Therefore, we hypothesize that sHFD enhancement of radiotherapy and ceramides effect on DNA repair capacity are maintained in CRPC settings.

METHODS: We used MyC-CaP, a MYC-driven CSPC model to establish isogenic CRPC sublines. Briefly, tumour-bearing FVB mice were castrated and after initial response and subsequent relapse, castrate-resistant tumours were collected and passaged in castrated hosts. Cer16(d18:0/16:0), Cer16(d18:1/16:0), and Cer22 (d18:1/22:0) were three ceramides found to be elevated in the plasma of HFD-fed mice. CRPC models were assessed for DNA damage induction by using immunofluorescence to detect □H2AX in response to treatment with ceramides. Additionally, we investigated the potentiation of radiotherapy in vivo (following sHFD intervention). Treatment efficacy was assessed by tumour growth rate and survival analysis.

RESULTS: Our findings reveal that Cer16 (d18:0/16:0) induces the greatest increase in □H2AX, indicative of heightened DNA damage, than other single ceramide or ceramide combinations in both CSPC and CRPC models. Similar to the CSPC models, our pilot experiment suggests that combining sHFD with radiotherapy also results in a stronger reduction of tumour growth compared to the control diet-fed group. These findings demonstrate that precision nutrition combined with radiotherapy has the ability to enhance treatment efficacy and improve outcomes in both CSPC and CRPC settings.

CONCLUSIONS: By enhancing the sensitivity of CRPC to DNA-damaging therapies through ceramide supplementation or dietary intervention, we aim to provide a basis to a precision nutrition strategy that can benefit CRPC patients for whom there is no definitive treatment. Therefore, this project holds promise for improving treatment outcomes and ultimately reducing mortality associated with CRPC.

Are RORγ+ Neutrophils a Suitable Therapeutic Target in Gastroesophageal Adenocarcinoma?

Iqraa Dhoparee-Doomah[1], Ariane Brassard[1], Sabrina Leo[1], Lixuan Feng[1], Qian Qiu[1], Xin Su[1], Betty Giannias[1], France Bourdeau[1], Jean Tchervenkov[2,3], Lorenzo Ferri[1,4], Jonathan Cools-Lartigue[1,4]

[1]Thoracic and Upper GI Cancer Research Laboratories, Research Institute of McGill University Health Center;
[2]Transplantation Immunology Laboratory, Research Institute of McGill University Health Center;
[3]Department of Surgery, Royal Victoria Hospital, McGill University;
[4]Department of Thoracic Surgery, Montreal General Hospital, McGill University

INTRODUCTION: The incidence of gastro-esophageal adenocarcinoma (GEA) is on a dramatic rise in Western countries. Despite recent oncological advances, the five-year survival rate remains at ~30%, emphasizing the need for more efficient therapeutic modalities. Neutrophil involvement in cancer progression has been a prominent area of research recently. A high neutrophil-to-lymphocyte ratio (NLR>4) has repeatedly been associated with worse outcomes in various cancers. However, there is no current therapy targeting this phenotype, which results from a process termed emergency myelopoiesis (EM). EM is the phenomenon where cancer cells secrete various factors that hijack our normal hematopoiesis and skew it towards an increased production of pro-tumour neutrophils. Previous studies have shown that the nuclear receptor retinoic-acid orphan receptor gamma (RORγ) is the key driver of this process, which produces RORγ+ neutrophils. We have previously demonstrated that GEA patients with a high NLR have a higher prevalence of circulating RORγ+ neutrophils compared to low NLR patients and healthy controls. This study thus aims to assess the functional roles of RORγ+ neutrophils in GEA.

METHODS: (1) Peripheral blood collected from treatment naïve GEA patients at the Thoracic clinic of the Montreal General Hospital were lysed and stained for flow cytometry. (2) Normal and cancerous tissues of the stomach and esophagus were collected from 30 GEA patients to build a tumour microarray, which was subsequently stained using multiplex immunofluorescence. (3) RNA was extracted from tumour tissues of GEA patients and sent for single cell RNA sequencing.

RESULTS: Our data demonstrate that: (1a) RORγ+ neutrophils were found to have a higher expression of programmed death-ligand 1 (PD-L1) and interleukin-17 (IL-17) compared to RORγ-neutrophils, hinting towards a proinflammatory and immunosuppressive phenotype. (1b) RORγ+ neutrophils are a heterogenous population of both mature and immature neutrophils. (2) RORγ+ neutrophils preferentially migrate to the tumour. (3) Intratumoural RORγ+ neutrophils possess pro-tumour properties.

CONCLUSIONS: Our findings are the first to associate a high circulating NLR with a higher prevalence of circulating RORγ+ neutrophils in GEA, thus demonstrating evidence of emergency myelopoiesis in patients. Additionally, these data demonstrate the tumour-permissive roles of both circulating and intratumoural RORγ+ neutrophils in GEA, making them a prime and novel therapeutic target that can be utilized in conjunction with the standard of care to improve outcomes of high NLR GEA patients

Regenerative Approaches to Treat Disc Degeneration and Low Back Pain

Saber Ghazizadeh1, Matthew Mannarino1, Hosni Cherif1, Lisbet Haglund1, 2

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[2]Shriners Hospital for Children, Montreal, QC H4A 0A9, Canada

INTRODUCTION: Low back pain is experienced by ~ 80% of individuals at some time in their lives and is globally the number one cause of years lived with disability. This age-related health problem is associated with intervertebral disc (IVD) degeneration in many individuals. Despite the prevalence, little is known about the molecular mechanisms leading to IVD degeneration and its associated pain. There is growing recognition that senescent cells accumulate with ageing and during tissue degeneration, where they contribute directly to disorders including heart disease, cancer and osteoarthritis. They adopt a so-called senescent associate phenotype (SASP) and produce high levels of inflammatory and pain-mediating factors. This study aims to evaluate the therapeutic potential of natural (o-Vanillin) and synthetic (RG7112) senolytics in an in vivo model of low back pain.

METHODS: Treatment of female and male sparc-/- mice began at 3–4 months of age just before the animals started signs of IVD degeneration and low back pain. Animals were treated by oral gavage bi-weekly for 6 months with either RG7112, o-Vanillin, or a combination of the two drugs. Grip strength, acetone-evoked behavior and mechanical sensitivity to von Frey filaments tests were assessed. High-resolution micro-CT scans of the spine were obtained to evaluate IVD volume and vertebral bone quality. IVDs were processed at the termination of the experiment, to evaluate SASP factor release using a Luminex assay.

RESULTS: Senolytic drug treatment of young sparc-/- mice significantly prevented the progression of IVD degeneration and behavioural signs of back pain. The pain scores were significantly lower at the end of the 6 months treatment in all treatment groups. Using Luminex assay we determined reduced levels of SASP factor release in the treated groups. We observed a significantly improved disc volume in the RG7112 and combination groups. In addition, the vertebral bone quality was significantly improved in all treatment groups.

CONCLUSIONS: The senolytic drugs o-Vanillin and RG7112 reduce pain and improve disc structure and bone quality in an in vivo mouse model of IVD degeneration and low back pain. Both drugs reduced pain behaviour, SASP factor release and improved IVD heath and bone quality with a more robust response when the drugs were given as a combination treatment.

Expression of miRNA has-miR-7977 as a Predictive Biomarker Associated with Response to Gemcitabine and Docetaxel in Leiomyosarcoma

Pegah Rahimizadeh[1,2], Philippe Jolivet[2], Matt van de Rijn[3], Joanna Przybyl[2,4]

[1]Division of Surgical and Interventional Sciences, McGill University;
[2]Cancer Research Program, The Research Institute of the McGill University Health Centre;
[3]Department of Pathology, Stanford University, CA, USA
[4]Department of Surgery, McGill University, Montreal, QC, Canada

INTRODUCTION: Combination of gemcitabine and docetaxel (Gem/Tax) is one of the most frequently considered systemic first-line regimens for leiomyosarcoma (LMS) patients with advanced disease. However, there is wide heterogeneity in clinical responses with only a subset of patients responding to this treatment. There is currently a poor understanding of the biology underlying this differential response and there are no predictive biomarkers for the response to Gem/Tax in LMS. The identification of biomarkers of response to Gem/Tax would allow clinicians to treat only those patients that are most likely to receive long-term durable benefit, while sparing the toxicity of drug exposure for those patients who are unlikely to benefit this therapy.

METHODS: To identify predictive markers for Gem/Tax response in LMS, miRNA expression was profiled in 43 archival untreated primary tumor specimens from patients who then underwent adjuvant treatment with Gem/Tax (20 responders, 23 non-responders). We performed differential expression analysis to identify miRNAs up-/down-regulated in responders and non-responders (with adjusted $p < 0.05$, fold change ≥ 1.5 and ≤ -1.5, respectively). Whole transcriptome RNA-seq data from the same samples were used to investigate associations between differentially expressed miRNAs and candidate target genes. miRTarBase database (release 9.0) was used to identify known target genes. Pearson correlation was applied to identify genes positively and negatively regulated by selected miRNAs (with $r > 0.5$ or < -0.5, respectively and $p < 0.05$).

RESULTS: We identified one significantly up-regulated miRNA [has-miR-7977] in non-responders to Gem/Tax (adjusted $p < 0.001$, fold change = 1.74). Expression level of this miRNA was positively correlated with expression of 4 known target genes, including ACAA2 (role in fatty acid metabolism), NUDT5 (involved in RNA metabolism and stress response), ZNF107 (zinc finger protein with transcription factor function), HSPA14 (involved in cellular stress response and protein folding). This may indicate that up-regulated has-miR-7977 has a potential role in non-responders to Gem/Tax therapy.

CONCLUSIONS: This is the first study that identifies a miRNA as a candidate marker associated with response to Gem/Tax therapy in LMS patients. miRNAs associated with treatment response can potentially serve as early indicators, allowing clinicians to modify treatment plans and to minimize treatment-related adverse effects. Our findings warrant further studies to identify molecular mechanism of identified miRNA in the current cohort.

Differentiating Human Bone Marrow and Adipose-derived Stem Cells Towards Ligamentogenic Lineage Using Physiological Oxygen Tensions for Tissue Engineering Applications

Tarek Klaylat1,2; Peter Mounsef1,2; Paul Martineau1,2; Derek Rosenzweig2; Rahul Gawri1,2

[1]Regenerative Orthopedics and Innovation Laboratory, McGill University,
2Division of Orthopedic Surgery, Department of Surgery, McGill University

INTRODUCTION: Ligament injuries are common musculoskeletal injuries. Due to biomechanics and poor blood supply, ligament tissues do not heal and regenerate properly after injury. Ligament reconstruction surgery using auto/allografts suffers from high failure, complication, and revision rates. Implantable cell-laden bioengineered ligament grafts constitute a potential alternative solution, but still face the challenge of non-integration at the graft site. Nevertheless, the optimal source of cells and culture conditions for bioengineering ligament grafts remain a challenge. Stem cells from various sources, bone marrow (hBM-MSCs) and adipose-derived (hAD-MSCs), have been used for ligament bioengineering with limited success. Ligament tissue and the articular joint space have lower oxygen tensions than arterial and venous levels, and it is critical for optimal tissue physiology and bioengineered graft integration as the grafts grown in standard non-physiological tissue conditions face "adverse conditions" upon implantation. In this study, we hypothesized that culturing hBM-MSCs and hAD-MSCs under optimized near physiological oxygen tensions would enhance their differentiation into the ligamentogenic lineage for use in ligament tissue engineering.

METHODS: hBM-MSCs and hAD-MSCs (RoosterBio) were cultured for 10 days at 37°C in DMEM supplemented with 5ng/mL TGF-β, 1ng/mL bFGF, and 50 µg/ml L-ascorbate under three different oxygen tensions: atmospheric and standard cell culture (20% O_2), intravenous (5% O_2), and intraarticular (2% O_2) oxygen tensions. Cell-seeded culture plates were placed in a standard incubator with 5% CO_2 at 37°C for atmospheric oxygen tension. For intravenous and intraarticular oxygen tensions, hypoxia incubator chambers (StemCell Technologies) were sealed, and flushed with 5% O_2 and 2% O_2 gas premixes respectively and placed inside an incubator at 37°C with media changes every 3 days, after which the chambers were resealed and reflushed. After 10 days, cell proliferation and viability were assessed, AlamarBlueTM assay was performed to evaluate the metabolic activity, and qPCR was performed to evaluate gene expression of ligament markers.

RESULTS: Our data show that 5% oxygen tension does not affect the viability of hBM-MSCs and hAD-MSCs, whereas 2% oxygen tension slightly decreases the viability of hBM-MSCs. Growth rate analyses reveal that lower oxygen tensions do not affect cell growth. AlamarBlueTM assay readings indicate a significant increase in the metabolic activity of hBM-MSCs under 2% and 5% oxygen tensions and hAD-MSCs under 5% oxygen tension. Finally, qPCR results indicate higher levels of collagen type-1, tenascin C, and scleraxis expression in hBM-MSCs under 2% oxygen tension. Gene expression analysis for the same markers in hAD-MSCs was inconclusive.

CONCLUSIONS: These findings suggest that hypoxic culture conditions enhance the ligamentization potential of hBM-MSCs cultured in culture media with TGF- β and bFGF. Optimizing culture conditions for differentiating hBM-MSCs and hAD-MSCs into the ligamentogenic lineage would allow us to use these cells in bioengineered ligament grafts for ligament reconstruction. Moreover, priming and maturing these cell-seeded bioengineered grafts under near-physiological conditions potentially enhances their integration at the intraarticular graft site, thus lowering revision rates and enhancing the patient's quality of life.

Session 2: Outcomes

Uncovering Patient Sensitivity to Doxorubicin Using Donor-Derived Cardiomyocytes

Ludovic Mouttet1, Elise Rody2, Ida Derish1,3, Mehran Mottahedi1 and Renzo Cecere1,2

[1]Department of Surgical and Interventional Sciences, McGill University;
[2]Department of Surgery, Division of Cardiac Surgery, McGill University Health Center;
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INTRODUCTION: Facet joint osteoarthritis (OA) is prevalent in young patients with adolescent idiopathic scoliosis (AIS) and might contribute to the disease progression and perceived pain. Toll-like receptors (TLR) activation has been linked to cartilaginous tissue degeneration and the production of pro-inflammatory factors. We previously found a negative correlation between osteoarthritic severity and subchondral bone density in facet joints from AIS patients, similar to changes seen in adult OA patients. Studies have shown that subchondral bone undergoes active remodeling as it attempts to adapt to the loss of cartilage and maintain joint stability. However, the balance of bone turnover and bone synthesis is perturbed by inflammatory mediators resulting in bone resorption in the early phase of OA while leading to subchondral plate densification and formation of osteophytes in the late phase.

METHOD: Based on our previous findings, we hypothesized that Toll-like receptor (TLR) activation in facet joint chondrocytes is an important regulator of pro-inflammatory and osteoclastogenic factors leading to bone loss and cartilage degeneration. To investigate these pathological mechanisms, we analyzed the transcriptome profile of both isolated chondrocytes (CC) and osteoblasts (OB) from AIS and non-scoliotic facet joints. A total of 2855 DEGs of CC (1065 downregulated and 1790 upregulated DEGs) and 1358 DEGs of OB (798 downregulated and 560 upregulated DEGs) were identified between AIS and control samples (n=3).

RESULTS: These upregulated CC DEGs were primarily enriched in Toll-like receptor signaling, cytokine-mediated signaling pathways, and calcium signaling pathways (GO and KEGG). Moreover, several GO terms related to bone remodeling were enriched significantly including osteoblast proliferation, osteoclast proliferation, ossification, trabecular formation, and rheumatoid arthritis (KEGG). The protein-protein interaction system of CC-upregulated DEGs also showed that TLRs were the key proteins in the first-ranked cluster, suggesting TLR activation could be the key biological event in the crosstalk between cartilage and bone. We further demonstrated that conditioned media from TLR-activated chondrocytes inhibit osteoblast mineralization while promoting osteoclast precursor cell proliferation in vitro.

CONCLUSIONS: In summary, our data suggests that scoliotic chondrocytes disrupt the homeostatic balance of bone resorption and synthesis through TLR activation. TLR inhibitors could have dual therapeutic outcomes including restoring cartilage health and preventing bone loss. A healthier facet joint can stabilize the spine, therefore potentially slowing down curve progression, and decreasing or avoiding the patient's need for surgery.

Predictors of In-Hospital Opioid Consumption and Discharge Prescribing Following Cesarean Delivery

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INTRODUCTION: Opioids are widely prescribed for postoperative analgesia after caesarean delivery (CD), however, increased postoperative opioid consumption may lead to adverse events that hinder recovery (i.e., nausea, vomiting, and sedation). Importantly, increased opioid consumption in-hospital is also a risk factor for persistent opioid use, which may contribute to the ongoing opioid crisis. To enhance the quality of care after CD, it is essential to understand patients' current in-hospital analgesia requirements, as well as identify modifiable factors associated with increased opioid consumption and prescription at discharge. The primary aim of this study was to assess the rates and predictors of in-hospital opioid consumption after CD. Secondarily, we evaluated rates and predictors of opioid prescribing at hospital discharge.

METHODS: This retrospective cohort study included patients undergoing CD at a university-affiliated hospital from 12/2020-12/2021. Patient demographics, care characteristics, in-hospital opioid consumption and discharge prescription (converted to the equivalent number of morphine 5 mg pills) were collected from medical records. Predictors were analyzed using negative binomial regression with multiple imputations for missing data. p-values < 0.05 were considered significant.

RESULTS: 904 patients were included (age 34.9±5 years, gestational age 38±3 weeks, multiple gestations 5%, previous CD 44%, emergency CD 40%, length of stay 2.3±1 days). In-hospital analgesia prescriptions included acetaminophen (100%), nonsteroidal anti-inflammatory drugs [NSAIDs] (91%), and opioids (100%). Median in-hospital opioid consumption was zero morphine 5 mg pills [IQR 0-2]. Increased opioid consumption was associated with older age (Incidence Rate Ratio 1.03 [95%CI 1.02-1.05]), ASA > 3 (1.30 [95%CI 1.003-1.68]), multiple gestations (1.75 [95%CI 1.22-2.50]), opioid consumption during pregnancy (19.13 [95%CI 6.82-53.66]), emergency CD (1.35 [95%CI 1.13-1.61]), longer surgery duration (1.01 [95%CI 1.002-1.014]), no in-hospital consumption of NSAIDs (0.42 [95%CI 0.32-0.56]), and higher opioid consumption in the post-anesthesia care unit (1.02 [95%CI 1.02-1.03]). At discharge, 89% of patients were prescribed opioids, receiving a median of twenty morphine 5 mg pills [IQR 20-20]. Receiving a pre-printed discharge prescription form with ten morphine 5 mg tablets instead of twenty was associated with decreased opioid prescription at discharge (0.55 [95%CI 0.40-0.77]).

CONCLUSIONS: This study supports that in-patient opioid consumption following CD is generally low and identified several patient and care factors associated with increased opioid use. While most patients were prescribed opioids at discharge, the amount of opioids prescribed at discharge was only associated with the pre-printed discharge prescription form. These findings suggest that addressing modifiable predictors of opioid consumption and optimizing obstetricians' prescribing decision-making may reduce opioid-related harms after CD.

Usability of the Patient Generated Index (PGI): Insights from Children, Young People, and Clinicians in the Context of the Long-term Follow-up of Esophageal Atresia

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INTRODUCTION: This study investigates the quality of life (QoL) in pediatric patients following neonatal repair for esophageal atresia (EA) using the Patient-Generated Index (PGI) alongside standard measures. The study aims to identify patient-valued life domains using the PGI, compare them with existing QoL measures, and assess the PGI's relevance and usability.

METHODS: The study used three Patient-Reported Outcome Measures (PROMs): PGI, EuroQol-5D (Youth) (EQ-5D-Y), and Patient-Reported Outcome Measurement Information System (PROMIS) Pediatric Short Form. The PGI assesses individualized perceptions of quality of life, while the EQ-5D-Y and PROMIS measure health-related quality of life (HRQoL). The PROMs were answered by children aged 3-17 who underwent EA surgery at the Montreal Children's Hospital (MCH) between 2005-2022.

RESULTS: The PGI identified 58 text threads from 15 interviews, covering 14 impairments, 15 activity limitations, and 3 environmental factors. The prevalence of "looking after one's health" highlights a strong focus on health management. QoL scores showed differences between the PGI and standardized measures. The PGI demonstrated construct validity, aligning with relevant disease specific QoL measures. A low correlation was observed between the PGI and standardized measures. Cognitive testing revealed varied patient feedback on the PGI: eight found it straightforward, while two encountered difficulties, especially with the coin allocation system. Clinicians also provided perspectives on the usability of the measures.

CONCLUSIONS: The study highlights PGI's value in capturing post-esophageal atresia surgery QoL in pediatric patients. The PGI emerges as a valuable tool for guiding personalized treatment decisions and improving communication between healthcare providers and pediatric patients.

Cost-Effectiveness of Olaparib Vs. Rucaparib for Patients with Metastatic Castration-Resistant Prostate Cancer – The Canadian Perspective

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INTRODUCTION: Through phase III clinical trials, olaparib and rucaparib, (poly(adenosine diphosphate–ribose) polymerase inhibitors) have demonstrated outcome improvements in metastatic castration-resistant prostate cancer (mCRPC) patients with alterations of BRCA1/2 and having progressed on second-generation androgen-receptor pathway inhibitor (ARPI). While improving outcomes, rucaparib and olaparib contribute to the ever-growing economic burden of PCa. Cost-effectiveness analyses are needed to estimate their economic impact. To evaluate the cost-effectiveness of olaparib and rucaparib versus physician's choice (docetaxel or ARPI) for mCRPC patients with BRCA1/2 mutations in a Canadian healthcare setting.

METHODS: Partitioned survival models were created to represent mCRPC disease after progression on ARPI until death or 5 years. Survival inputs were extracted from PROfound and TRITON3. Ola costs were extracted from the Quebec Health Insurance Board medication list. As rucaparib is not commercially available in Canada, we hypothesized that it will be priced on par with Olaparib.

RESULTS: Our findings suggest that rucaparib provides better survival benefit in terms of quality-adjusted life years (QALY) than olaparib, but at a higher cost (ICER $301,182/QALY). When compared to docetaxel, olaparib and rucaparib provided additional 0.07 and 0.24 QALY with additional costs of $78,246 and $129,547, resulting in ICERs of $1,078,005/QALY and $522,504/QALY respectively. When compared to ARPI, olaparib and rucaparib demonstrated clinical benefit and ICERs of $580,158/QALY and $503,417/QALY respectively.

CONCLUSIONS: While providing survival benefit to mCRPC patients presenting alterations of BRCA genes, the cost of olaparib and rucaparib requires major reductions to be considered cost-effective in the Canadian healthcare perspective.

Enhancing Precision for Soft Surgical Robots using Bi-level Autoencoder-based Control

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INTRODUCTION: Recent advancements in soft robotics have opened new horizons for their application in the medical field, particularly in surgeries requiring high precision and safety. Unlike traditional rigid robots, soft robots mimic the flexibility and adaptability of biological tissues, making them ideal for navigating the complex and delicate environments of the human body. These robots are fabricated from complex elastomers that exhibit nonlinear and sometimes non-repeatable mechanical behaviors. Despite being a favorable alternative to rigid robots, their mechanical non-linear dynamics has prevented their global adoption. This study was an attempt to capture such nonlinear dynamics behavior using an innovative bi-level auto-encoder for precise motion control.

METHODS: In this study we developed a proprietary 3D-printed, tendon-driven soft robot, combining soft and rigid materials for optimal flexibility and rigidity, aimed at minimally invasive surgery. Control was achieved through agonist-antagonist tendon pairs driven by precision motors, allowing for detailed manipulation. An electromagnetic tracker system (Aurora, Northern Digital Inc.) tracked the robot's position in real-time, feeding data into an autoencoder network designed to model the robot's movements. This network, which included layers for data compression and a latent space representing the robot's degrees of freedom, was integrated with a neural network controller for predicting positional data. This methodology combined advanced fabrication, precise control, and machine learning to enhance the robot's surgical accuracy and reliability, illustrating a significant advancement in soft robotics for medical applications.

RESULTS: Experimental evaluation involved subjecting the soft robot to predefined trajectories (square, triangular, and the infinity symbol), with the robot's tip position and motor encoder outputs recorded. These data were processed by the autoencoder to refine the system's vital data, which was then fed into the neural network to predict the robot's position. The system demonstrated Mean Absolute Errors (MAE) of down to 3.2±1.3 mm on the x-axis, 2.5±1.25 mm on the y-axis, and 1.3±0.85 mm on the z-axis. For tasks demanding accuracies of less than 5mm, such as simulated area-targeted drug delivery, significantly outperforming traditional methods.

CONCLUSIONS: This research marks a significant leap in soft robotics for medical use, showcasing an innovative autoencoder-based neural network model that enhances precision and reliability in surgical procedures. Our findings reveal the model's potential for intricate surgical tasks, bridging the gap between current limitations and the future of minimally invasive surgery. As we move towards real-world applications, this technology promises to revolutionize surgical practices, offering improved patient outcomes through advanced robotic precision.

Isokinetic AZGP1: A Potential Prognostic Biomarker in Prostate Cancer

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INTRODUCTION: Prostate cancer's (PCa) clinical heterogeneity makes accurate prognostication a challenge. Current markers like Grade group and prostate-specific antigen (PSA) levels do not accurately predict clinical outcome for individual patients and do not allow for optimal treatment decisions. This highlights the need for improved biomarkers. Zinc alpha-2 glycoprotein (AZGP1) is a potential prognostic biomarker. Previous studies have shown AZGP1 expression to be reduced in aggressive subgroups of prostate tumor associated with poor outcome. However, the association between AZGP1 expression in benign tissue and the corresponding tumor outcome remained unexplored. This study aimed to measure AZGP1 levels in benign prostate tissue of PCa patients and assess its association with clinical outcomes for the corresponding tumors. We hypothesized low benign AZGP1 levels to be associated with poor tumor outcome.

METHODS: AZGP1 expression was measured by immunohistochemistry on a tissue microarray (TMA) with both malignant and matched benign tissues representing 1267 radical prostatectomy (RP) cases with clinical correlates. AZGP1 levels were quantified using the H-score method and its prognostic value was assessed by Kaplan-Meier and Cox analyses. Tumor cores of this TMA were previously scored.

RESULTS: Out of 1267 RP cases, 1233 (97%) had at least one scorable benign core. Benign epithelial cells exhibited cytoplasmic AZGP1 staining that varied among cases with H-scores ranging from 0 to 300. Notably, a higher proportion of benign samples showed strong AZGP1 expression (H-score≥200) compared to tumor samples (33% vs. 21%, respectively). Conversely, a subset of benign samples (4%) had lower H-scores (0-49) compared to 17% of tumor samples. AZGP1 levels were thus significantly lower in tumor samples compared to matched benign samples ($P<0.001$). Strong benign AZGP1 staining was associated with lower risk of biochemical recurrence (BCR) with a hazard ratio of 0.70 ($P=0.01$). Benign AZGP1 expression further BCR risk-stratified patients with favorable prognostic factors like Grade group 1-2, negative surgical margin, and preoperative PSA≤10 ($P<0.05$).

CONCLUSIONS: This study revealed a significant variation in benign prostate AZGP1 expression among PCa cases in which a strong staining was associated with a lower risk of relapse after surgery. Thus, the study highlights the potential of AZGP1 as a prognostic biomarker, aiding tumor prognosis via benign tissue assessment and offering insights for improved treatment and risk assessment.

The Impact of Adjunct Medical Therapy on Survival After Spine Metastasis: A Systematic Review and Pooled Data Analysis

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INTRODUCTION: Tumor specific targeted immunotherapy has substantially impacted the quality and quantity of life for patients with spinal metastatic malignancies. Numerous scoring utilities such as the Tokuhashi, Tomita or Spinal Instability Neoplastic score (SINS) are often used to prognosticate treatment and guide surgical management. However, many of these scoring systems are potentially outdated and do not reflect the recent advances made in medical oncology and targeted therapeutic treatment. The primary aim of this research was to investigate the current state of the literature and treatment options pertaining to advancements in targeted systemic therapy compared to other forms of medical management for metastatic spinal tumors.

METHODS: A systematic literature review and pooled data analysis were performed to evaluate the median overall survival (mOS) for patients with metastatic spinal tumors originating from five (lung, breast, renal, melanoma, thyroid) common primary cancers. A comprehensive search of PubMed was conducted by two authors to identify relevant articles for review.

RESULTS: Following the PRISMA guidelines, 28 of 1834 initially identified articles met our inclusion criteria, encompassing five primary tumor locations. Lung cancer articles (n=16) reported a weighted mOS of 6.8 months, while articles on breast cancer (n=5) showed 24.0 months, renal cancer (n=3) demonstrated 58.1 months, and thyroid cancer (n=1) exhibited 123.0 months. 15/16 identified articles on lung cancer with spinal metastases included targeted therapy (TT), primarily utilizing EGFR-TKI, resulting in significant improvements in mOS (21.0 months) compared to those without TT (5.65 months). Six of these articles reported statistically significant ($p<0.05$) hazard ratios (HR), and the pooled HR was 0.486. Breast cancer patients who received TT also had a higher mOS (83.2 months) compared to those without TT (mOS = 32.86). All three melanoma papers reported patients receiving TT, with two showing a mOS improvement, and notably, one paper indicated significance thereof (HR: 0.32, CI: 0.17-0.58, $p=0.0002$). Of all included articles, only five studies utilized bisphosphonate therapy. Among these, four demonstrated an extension in mOS when compared to non-treatment groups, with three of them showing statistically significant improvements ($p<0.05$). Among the five lung cancer papers that reported outcomes for both chemotherapy and non-chemotherapy groups, four indicated higher mOS with chemotherapy, with one showing statistical significance ($p<0.001$). Similarly, the breast cancer paper reporting chemotherapy outcomes demonstrated a significant mOS improvement ($p=0.013$). Articles were excluded if they did not consistently report chemotherapy use or provide survival outcomes.

CONCLUSIONS: Based on this review and pooled data analysis, targeted therapy, especially in lung and breast cancers, demonstrated the most notable improvements in mOS. Our study provides valuable insights into the recent advancement of medical management of metastatic spinal tumors. Future indications include incorporating this literature into personalized treatment approaches to metastatic spine tumors.

Reimagining Hospital Care with Young Voices: The Power of Play and Theatre

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INTRODUCTION: Osteogenesis Imperfecta (OI) is a genetic bone disorder causing connective tissue weakening, bone fragility, and quality of life concerns. OI remain largely unknown to healthcare providers, which can cause ethical concerns in children's OI care. Researchers have shown that using play, such as theatre, can support children's efforts to process and discuss their experiences. Children from Shriners Hospitals for Children-Canada, a specialized pediatric orthopaedic hospital, collaboratively created a play called "The Hospital of Unhappy Surprises" detailing "bad" hospital environments and children's vision for an ideal practice. The aim of this study is to create a professionally animated version of "The Hospital of Unhappy Surprises" with the global OI community.

METHODS: This study used ethno-dramatic storytelling to elicit children's voices and transform oppressive scenarios into liberating ones. Children participated in semi-structured, online interviews using print-out puppets. Children were shown a preliminary staging of the play and invited to express and/or act out their experiences, permitting the fictional portrayal of children's lived experiences.

RESULTS: Seventeen children (ages 4-18) participated from the United States, Canada, and Europe. The play reminded them of their own experiences, facilitating discussions with researchers. Children reported experiencing fear, frustration, and difficulties engaging in their OI care due to complex medical terminology, lack of information and resources about OI, and clinicians' lack of OI knowledge. Children experienced elevated anxiety during x-rays and unexpected hospitalizations when pain control and communication were lacking.

CONCLUSIONS: This study represents the push needed to: (a) understand the experiences of OI-affected children via alternative means of engagement (e.g., play, art); (b) produce educational resources that align with children's needs; and (c) support clinician's abilities to meet children's needs

Comparative Analysis of Equipment-Free Tasks for Biomechanical Assessment: Identifying Optimal Replacement of Drop Vertical Jump in Evaluating ACL Injury Risk

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INTRODUCTION: Knee kinematics during a drop vertical jump (DVJ) have been associated with a heightened susceptibility to non-contact anterior cruciate ligament (ACL) injury. Females and those with a history of ACL injury constitute a vulnerable population. While various equipment-free tasks exist to evaluate the factors linked to ACL injury or reinjury risk, the clinical significance of these tests remains to be determined. The study aims to distinguish biomechanical differences between sexes and between healthy and post-ACL reconstruction (ACLR) cohorts and establish the clinical relevance of equipment-free tasks.

METHODS: Marker-based motion captures were collected from 20 healthy athletes and 20 ACLR groups during a DVJ, tuck jump, single-leg squat, and single-leg hop. Pearson's correlation coefficient analyzed DVJ and equipment-free task relationships, while a two-way ANOVA and Cohen's d explored between-group differences and effect sizes.

RESULTS: Significant differences between sexes in knee flexion angle (effect size range, d=0.60 to d=1.13) and knee adduction angle (effect size range, d=0.37 to d=1.60) were observed during a DVJ, but not between healthy and ACLR cohorts. A significant ACL status effect was shown in the non-study limb for initial contact knee adduction for the DVJ (effect size range, d=0.40 to d=0.75). The tuck jump assessment exhibited significant sex-based differences in the initial contact and peak knee adduction angles (effect size range, d= 0.71 to d = 1.72); however, no statistically significant differences in the peak knee flexion angles were observed. A significant ACL status effect was shown for peak knee adduction in the non-study limb (effect size, d= 0.74). Significant differences in peak knee flexion and peak knee adduction angles (effect size range, d= 0.78 to d=1.60) were shown between sexes during a single-leg squat; however, no statistically significant differences in the initial contact knee adduction angles were observed. Significant sex-based differences in peak knee flexion, initial contact knee adduction, and peak knee adduction angles (effect size range, d= 0.56 to d=1.16) were revealed during a single-leg hop. A significant ACL status effect was observed for initial contact knee adduction in the study limb (effect size range, d= 0.71 to d=1.03). There was a statistically significant, moderate correlation between the DVJ, single-leg squat, and single-leg hop for peak knee flexion angles in the study and non-study limbs. The correlation for peak knee flexion between the DVJ and the tuck jump assessment was low, with negligible correlation in the study limb. Moreover, a statistically significant, moderate-to-high correlation was shown between the DVJ, the tuck jump assessment, the single-leg squat, and the single-leg hop at initial contact and peak knee adduction angles and peak knee flexion angles in the study and non-study limbs.

CONCLUSIONS: The study identified marginal variations between the healthy and ACLR groups when matched for age and sex. However, significant sex-related differences in knee kinematics were evident across both healthy and ACLR cohorts, particularly highlighted during the single-leg hop. The findings demonstrated a medium-to-large correlation between the DVJ and the single-leg hop, suggesting that the latter may serve as an effective equipment-free screening tool for evaluating the susceptibility to ACL injury. CONCLUSIONS: Patients undergoing tumor volume reduction surgery of CRLM demonstrated a survival benefit compared to patients who did not undergo any surgical resection. There was no difference in the survival associated with the tumor volume resected. This suggests there may be a potential systemic benefit to reducing overall tumor burden. This preliminary study provides the framework to further explore the systemic effects of surgical tumor volume reduction of CRLM to improve median survival as an extended criterion for liver resection.

Harassment in Medical Education: A Psychophysiological Perspective through the Analysis of Electrodermal Activity

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INTRODUCTION: Harassment has harmful effects on the emotional well-being of medical trainees and ultimately the quality of patient care. However, effective interventions to prevent and address harassment are lacking. Simulation-based training is therefore used as an anti-harassment training tool in a novel and promising approach, allowing learners to process and reflect on their emotional reactions to high-stress situations in a safe environment. Drawing from control-value theory, electrodermal activity (EDA) is a psychophysiological signal that measures skin conductance as a reflection of emotional arousal.

METHODS: Analyzing EDA during anti-harassment simulations allows to objectively link trainees' emotional arousal with behavioral outcomes. This study therefore investigated the impact of harassment on medical trainees' psychophysiological responses and behavioural outcomes. We aimed to determine if harassment events were associated with meaningful variations in arousal levels and whether these levels could predict trainees' intervention decisions. Internal Medicine trainees were recruited and divided into two groups. One watched anti-harassment educational videos on harassment intervention before participating in a training simulation (Video-first group), and the other experienced these in reverse order (Simulation-first group).

RESULTS: We observed significant increases in arousal during and after harassment events compared to baseline in both groups. Notably, the Video-first group had significantly higher arousal levels during the harassment than after the harassment and showed a higher likelihood of intervening.

CONCLUSIONS: Our research bridges the gap between theory and practice, highlighting the crucial interplay between arousal and training sequence in decision-making after harassment events within clinical settings. Results underscore the need for well-structured training programs in medical education.

POSTERS

THEME: Basic Science

1. The crosstalk between cartilage to bone in adolescent idiopathic scoliosis

Kai Sheng1, Daniel G Bisson1, Jean Ouellet1, Neil Saran1, Svetlana Komarova1, Lisbet Haglund1

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2. Precision nutrition: A strategy to improve radiotherapy outcomes in MYC-driven prostate cancer

Walaa Alahmadi1,2, Maria Fernandez2, Shama Naz3, Anna de Polo2, Nadia Boufaied2, Dajana Vuckovic3, David P. Labbé1,2,4

1Division of Experimental Medicine, Department of Medicine, McGill University; 2Cancer Research Program, RI-MUHC; 3Department of Chemistry and Biochemistry, Concordia University; 4Division of Urology, Department of Surgery, McGill University

3. Protein CoAlation is a novel posttranslational modification involved in human sperm capacitation and antioxidant response

Chika Onochie1,2 and Cristian O'Flaherty1,2,3

1 Pharmacology and Therapeutics Department, McGill University; 2 The Research Institute, McGill University Health Centre; 3Surgery Department, McGill University.

4. Spinal Senescence as a Therapeutic Target to Treat Painful Disc Degeneration

Juiena Sagir1, Saber Ghazizadeh1, Matthew Mannarino1, Hosni Cherif1, Lisbet Haglund1,2

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5. Sustaining Ischemic Tissue Throughout the Healing Process

Ayden Watt1, Benjamin Dallison2, Parsa Azizi-Mehr1, Hani Shash3, Mirko Gilardino4, Jake Barralet2,4.

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6. Soluble advanced glycation endproducts block prostate cancer aggressive phenotypes

Justin Matta1, Rachel Monk1, Daniela Vieira1, Graziele Cruzado2, Edward Harvey1, Geraldine Merle1,2

1 Division of Surgical and Interventional Sciences, McGill University;2 Department of Biomedical Engineering, Polytechnique Montréal.

7. Synergistic Coupling of PTH Treatment with Cold Therapy to Enhance Fracture Healing

Matthew Zakaria1, Michael Grantb, Fackson Mwalea,2, Geraldine Merle3, Edward Harvey1

1Orthopaedics Division, Montreal General Hospital, 2Lady Davis Research Institute, Jewish General Hospital, 3Department of Chemical Engineering, Polytechnique Montreal

8. Advanced glycation end products irreversibly inhibit prostate cancer aggressive phenotypes through induced senescence

Luisa Bacca1,2, Tarek Hallal2,3, Carole Luthold4, Kevin Homsy4, Nadia Boufaied2, François Bordeleau4, David P. Labbé1,2,3,5,

1Division of Experimental Medicine, McGill University; 2Cancer Research Program, Research Institute of the McGill University Health Centre; 3Department of Anatomy and Cell Biology, McGill University; 4Département de biologie moléculaire, de biochimie médicale et de pathologie, Université Laval; 5Division of Urology, Department of Surgery, McGill University

9. The Role of Physical Effects in Material Induced Bone Formation

Sabah Oghazian 1, Edward Harvey2, Mirko Gilardno3, Nicholas Makhoul4, Jake Barralet1,2.

1 Faculty of Dentistry, McGill University 2 Division of Orthopaedics, 3 Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, and Health Sciences 4 Division of Oral and Maxillofacial Surgery, Faculty of Dentistry, McGill University

10. Impaired TGF-β receptor internalization is associated with reduced TGF- receptor II-caveolin-1 interaction in scleroderma fibroblasts

Irvens Fanelus1**, Saniya Pamnani1,** Kenneth W Finnson1, Murray Baron2, Anie Philip1

1Division of Plastic Surgery, Department of Surgery Research, McGill University; 2Department of Rheumatology, Jewish General Hospital, Montreal.

11. Lipid Rafts and Sphingolipids are Essential for Human Sperm Capacitation

Steven Serafini1,2,3, Dr. Cristian O'Flaherty1,2,3,4

Departments of Medicine (Experimental Medicine Division)1, Surgery2, and 4Anatomy and Cell Biology, McGill University, and 3The Research Institute, MUCH, Montréal.

12. Epigenetic control of MYC-driven metabolic adaptations by FOXA1 in aggressive prostate cancer

Yiming Mao1,2, Jiaxuan Li1,2, Michelle Shen2,3, Léa-Kristine Demers1,2, Nadia Boufaied2, David P. Labbé1,2,3

1Division of Experimental Medicine, Department of Medicine, McGill University; 2Cancer Research Program, Research Institute of the McGill University Health Centre; 3Division of Urology, Department of Surgery, McGill University

13. Role A 3D-Printed Bone Metastasis Resection Model for Local Therapeutic Implant Screening to Prevent Recurrence

Ateeque Siddique1, Michael H. Weber1, Derek H. Rosenzweig1

1Surgical and Interventional Sciences, Gill University.

14. Venous Angiogenesis of Decellularized Dermis to Create Transplantable Dermal Substitutes

Sze Wai Lau1, Saba Oghazian2, Yu Ling Zhang1, Edward Harvey1, Nicholas Makhoul2, Jake Barralet1,2

1 Division of Orthopedics, Department of Surgery, Faculty of Medicine and Health Sciences, Montreal General Hospital, Montreal; 2Faculty of Dentistry, McGill University.

15. Assessing the Effect of Cyclical Strain on hbmMSCs Differentiation on 3D-Co-Printed Scaffolds for Ligament Replacement

1Alexandrine Dussault, 1Tarek Klaylat, 1Gargi Goel, 1,2,3Derek H Rosenzweig, 4,5Isabelle Villemure

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16. The Role of citrate in the production of nitric oxide during human sperm capacitation.

Diego Loggia1,2 and Cristian O'Flaherty1,2,3,4

1The Research Institute-MUHC and Departments of 1Pharmacology and Therapeutics, 2Surgery and 3Anatomy and Cell Biology.

17. Application of Inorganic Biomaterials in Wound Healing

Parsa Azizi-Mehr1, Yassine Ouhaddi1, Yu Ling Zhang1, Sze Wai Lau1, Nicholas Makhoulc,3,4, Mirko Gilardino3, Jake Barralet 1,4

1 Orthopedics Division, 2 Oral Surgery, 3Plastic Surgery Division, Department of Surgery, Faculty of Medicine and Health Sciences, Montreal General Hospital, 4 Faculty of Dentistry, McGill University

18. Targeting ErbB3-binding protein 1 (Ebp1) to resensitize aggressive high-MYC/low-AR prostate cancer to antiandrogen treatment

Xavier Ng1,2, Nadia Boufaied2, David P. Labbe1,2,3

1Division of Experimental Medicine, Department of Medicine, McGill University; 2Cancer Research Program, Research Institute of the McGill University Health Centre; 3Division of Urology, Department of Surgery, McGill University

19. FOXA1-dependent metabolic adaptations in MYC-driven prostate cancer

Jiaxuan Li1,2, Michelle Shen2,3, Nadia Boufaied2, Anna de Polo2, David P. Labbé1,2,3

1Division of Experimental Medicine, Department of Medicine, McGill University; 2Cancer Research Program, Research Institute of the McGill University Health Centre; 3Division of Urology, Department of Surgery, McGill University.

20. Adjuvant Therapy Using Senolytic Drugs to Prevent Breast-to-Bone Metastasis

Hamburger ECB1,2, Haglund L1,2,3, Rosenzweig DH1,2

1Orthopedic Research Laboratory, Department of Surgery, McGill University; 2Department of Surgery, The Research Institute of McGill University Heath Centre; 3Shriner's Hospital for Children, Montreal.

21. Role Investigating the Combination of Natural Killer Immunotherapy with Radiation Therapy for Muscle-Invasive Bladder Cancer.

Fatima Inigo1, Jose Joao Mansure1, Eva Michaud1, Brian Meehan1, Piccirillo Ciriaco2, Kassouf Wassim1,3.

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Microbiology and Immunology, McGill University; 3Department of Surgery, Division of Urology, McGill University.

22. Progress Dissecting the diet-dependent DNA damage response in prostate cancer

Jiachen Ji1,2, Walaa Alahmadi1,3, Maria Celia Fernandez1, Nadia Boufaied1, Richard Marcotte4, Dominique Trudel5, David P. Labbé1,2,3

1Cancer Research Program, Research Institute of the McGill University Health Center; 2Department of Surgical and Interventional Sciences, McGill University; 3Department of Experimental Medicine, McGill University; 4National Research Council Canada; 5Department of pathology, Centre de recherche du CHUM.

23. Evaluation of poly(styrene-b-isobutylene-b-styrene) (SIBS) as an alternative to silicone for biomaterial applications

Nikita Kalashnikov1 and Joshua Vorstenbosch1

1Division of Surgical and Interventional Sciences, Department of Surgery, McGill University.

24. Study of alginate-based hydrogels in skin flap ischemia model

Juliana Abbatt-Montpetit1, Parsa Azizi-Mehr1, Edward Harvey1,2, Jake Barralet1,2

1Surgical & Interventional Sciences Division, Department of Surgery, McGill University. 2Division of Orthopaedic Surgery, Department of Surgery, McGill University.

25. Cold Plasma-based Redox Therapy for Breast Cancer Bone Metastasis Tumor Growth Control

Laura Bouret1, Jean-Baptiste Billeau1, Michael Weber2, Derek Rosenzweig2, Stephan Reuter1

1Polytechnique Montreal, Montreal; 2McGill University.

26. IMP-1 regulated transcriptome in a murine model provides insights into pancreatic ductal adenocarcinoma progression in humans

Orçun Haçariz1, Julia Messina-Pacheco2, Alex Gregorieff2 and Pnina Brodt1

1 Surgical and Interventional Sciences, Cancer Research Program, Research Institute of the McGill University Health Center (RI-MUHC), 2. Department of Pathology, McGill University and Cancer Research Program, RI-MUHC, Montreal.

27. Short Link N Peptide Modulates Inflammasome Activity via CD14 Interaction: Potential Therapeutic for IVDD

Muskan Alad1,2, Michael P Grant2, Laura M Epure1,3, John Antoniou1,3,4, Fackson Mwale1,2.

1Department of Surgical and Interventional Sciences, McGill University; 2Lady Davis Institute for Medical Research, Montreal; 3Jewish General Hospital, Montreal; 4Department of Surgery, McGill University.

28. Role of soluble CD109 in the progression of head and neck squamous cell carcinoma

Varsha Reddy Durgempudi1, Tenzin Kungyal1, Anie Philip1

1Division of Plastic Surgery, Department of Surgery, McGill University.

29. Development of a 3D spheroid model for rapid screening of anti-fibrotic peptides

Zein Amro1, Shika Chawla1, Anie Philip1

1Division of Plastic Surgery, Department of Surgery, McGill University.

30. Identification of Extrachromosomal DNA specific Genetic Vulnerabilities in Colorectal Adenocarcinoma

Kyle H. White1.2, Juliana Cavalcante de Moura1, Swneke Bailey1,2,3,4

1The Cancer Research Program, Research Institute of the McGill University Health Centre (RI-MUHC); 2Department of Surgery, McGill University; 3Department of Experimental Medicine, McGill University; 4Department of Human Genetics, McGill University.

31. The proteomic profiles of the extracellular vesicles from human intervertebral disc cells and their regenerative potentials

Li Li1, Hadil Al-Jallad2, Miltiadis Georgiopoulos1,2, Rakan Bokhari1,2, Jean Ouellet1,2, Peter Jarzem1, Hosni Cherif1, Lisbet Haglund1,2

1Department of Surgery, McGill University; 2Shriners Hospital for Children, Montreal.

32. The Therapeutic Potential of Targeting Nuclear Receptor Retinoic Acid-Related Orphan Receptor Gamma (RORγ) in Hepatocellular Carcinoma

Sabrina Leo1,2, Sarita Negi2, Iqraa Dhoparee-Doomah1, Ahmed Fouda2, Steven Paraskevas2, Jonathan Cools-Lartigue1, Jean Tchervenkov2

1 Thoracic and Upper GI Cancer Research Laboratories; 2Transplantation Immunology Laboratory, Research Institute of the McGill University Health Centre.

33. Therapeutic potentials of extracellular vesicles derived from mouse DRG-conditioned media-primed human mesenchymal stem cells

Aiwei Sun1, Li Li2, Tarek Klaylat2, Gopeekrishnan Unnithan3, Magali Millecamps4, Laura Curran5, Rahul Gawri2,4, Lisbet Haglund1,2,4,5,6, Chan Gao2,3,4

1Departments of Anatomy and Cell Biology, McGill University; 2Department of Surgery, McGill University; 3Department of Medicine, McGill University; 4Alan Edwards Centre for Research on Pain, McGill University; 5The Research Institute of the McGill University Health Centre; 6Shriners Hospital for Children, Montreal.

34. The role of Stk19 in HPV positive Head and Neck Squamous Cell Carcinoma

Zahra Kardan1, Sampath Kumar Loganathan1

1Department of Surgical and Interventional Sciences, McGill University.

35. Mechanisms Driving Lung Fibrosis: Role of Cd109 as a Negative Regulator of Fibrotic Pathways and Macrophage Phenotype

Setareh Garousi1, Maha Alsharqi1, and Anie Philip2

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Surgery, Division of Plastic Surgery, McGill University.

THEME: Clinical

36. Liquid Biopsy Using dPCR for Detection of Minimal Residual Disease in Stage IV Colorectal Cancer

Jennifer Kalil1,2 Lucyna Krzywoń1,2, Stephanie K. Petrillo1, Migmar Tsamchoe1,3, Anthoula Lazaris1, Peter Metrakos1,2,3

1 Cancer Research Program, McGill University Health Center Research Institute; 2Department of Experimental Surgery, McGill University; 3Department of Anatomy and Cell Biology, McGill University.

37. Development of A priorities Assessment Tool to Support Shared Decision Making in Rectal Cancer Patients Undergoing Restorative Proctectomy

Temitope G. Joshua1, Michael F. Maalouf, Stephan Robitaille, Tiffany Paradis, Liane S. Feldman1,2, Julio F. Fiore Jr1, Sender Liberman3, Lawrence Lee2

1Department od Surgical and Interventional Sciences, McGill University; 2Department of Surgery, McGill University Health Centre; 3Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University Health Centre.

38. Identifying Residents' Emotion Regulation Strategies and their Effectiveness in Team-Based Medical Simulations

Keerat Grewal1, Sayed Azher1, Matthew Moreno1, Jason M. Harley1,2,3,4

1Department of Surgical and Interventional Sciences, McGill University; 2Steinberg Centre for Simulation and Interactive Learning; 3Research Institute of the McGill University Health Centre; Institute for Health Sciences Education, McGill University.

39. The Future in Bariatric Education: Mixed Reality Simulation

Harutyunyan, R.1; Jeffries, S.1,3; Xia, J.2; Magri, MJ.2; Iannotti, V.2; Malhi, Z.2; Hemmerling, T.1,3

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Electrical and Computer Engineering, McGill University; 3Department of Anesthesia, McGill University

40. Osteoclast indices in osteogenesis imperfecta: systematic review and meta-analysis

Sirion Aksornthong1,2, Priyesh Patel2,3, Svetlana V. Komarova1,2,3

1Department of Experimental Surgery, McGill University; 2Shriners Hospital for Children, Montréal; 3Faculty of Dental Medicine and Oral Health Sciences, McGill University.

41. Emotional Responses to Challenging Events in Virtual Simulations: Integrating Psychophysiological Measures and Qualitative Insights

Sayed Azher1, Keerat Grewal1, Negar Matin1, Amanda Cervantes2, Caroline Marchionni2, Hugo Marchand2, Jason M. Harley1,3,4,5

1Faculty of Medicine and Health Sciences, McGill University; 2Ingram School of Nursing, McGill University; 3Institute for Health Sciences Education, McGill University; 4Research Institute of the McGill University Health Centre; 5Steinberg Centre for Simulation and Interactive Learning, McGill University.

42. How do Residents Intervene Harassment During a Clinical Procedure: A Content Analysis of Simulation Debriefing

Byunghoon (Tony) Ahn1, Myriam Johnson1, Negar Matin1, Annika Delport1, Star Han1, So Yeon Lee2, Ning-Zi Sun1,3, Elias German1, Jaden Seligman1, Jason M. Harley1,3,4

1Faculty of Medicine and Health Sciences, McGill University; 2Faculty of Education, McGill University; 3Institute for Health Sciences Education, McGill University; 4Research Institute of the McGill University Health Centre.

43. Patterns of clinico-demographic and Kinematic Jumping Parameters amongst a Prospective Cohort of Elite Varsity Athletes with Non-Contact ACL tears.

Jason Corban1, Kevin Zhao1, Jenny Jing1, Paul A Martineau1

1Division of Orthopaedic Surgery, McGill University.

44. Unveiling the Silent Ecological Footprint: Quantifying Greenhouse Gas Emission in Healthcare

E. Pelletier, E. Zhang, K. Kanafani, Q. Zhang, Z.C. Zhang, S. Jeffries, T. Hemmerling

McGill University

45. Clinically Informed Optimized Trajectory Planning of 7-DOF Surgical Robots

Erfan Askarzadeh1,2, Jake Barralet1, Liane Feldman1, Amir Hooshiar1,2

1Department of Surgery, McGill University; 2Surgical Performance Enhancement Robotics (SuPER) Centre, McGill University

46. AI-assisted robotic surgery for gynecologic cancer

Yoav Brezinov1, Jeremie Abitbol2, Melica Brodeur1, Shannon Salvador1, Susie Lau1, Walter Gotlieb1

1Department of Gynecologic Oncology, Jewish General Hospital, McGill University; 2Castella Medical, Montreal.

47. Assisted Video Laryngoscopy (AVL): A Novel Technique for Endotracheal Intubation Using a Next-Generation AI Video Laryngoscope

Georgiy Danylenko1; Jeffries, S.1,2; Thomas Hemmerling1,2

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Anesthesia McGill University.

48. Deep Reinforcement Learning for General Anesthesia

Zheyan Tu1, Thomas Hemmerling1,2

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Anesthesia McGill University.

THEME: Outcome

49. Clinical Care Trajectory Assessment of Children with Congenital Diaphragmatic Hernia and Neurodevelopmental Impairment

Alexandra Dimmer1, Gabriel Altit2, Sabrina Beauseigle1, Elena Guadagno1, Louise Koclas2, Katryn Paquette2, Ana Sant'Ana2, Adam Shapiro3, Dan PoenaruD1*, Pramod Puligandla1*

1Harvey E. Beardmore Division of Pediatric Surgery, Montreal Children's Hospital, McGill University Health Centre; 2Division of Neonatology, Department of Pediatrics, Montreal Children's Hospital, McGill University Health Centre, McGill University; 3Division of Respiratory Medicine, Department of Pediatrics, Montreal Children's Hospital, McGill University Health Centre, McGill University.

50. Psychometric Assessment of PROMIS-29 as a Measure of Recovery After Colorectal Surgery

Francesca Fermi MD 1,2,3, Samin Shirzadi1,2, Ghadeer Olleik1,2, Makena Pook1,2, Maxime Lapointe Gagner1,2, Sarah Al Ben Ali1,4, Tahereh Najafi Ghezeljeh1,2, Naser Alali1,4, Katy Dmowski1,2, Pepa Kaneva1,2, Nicolò Pecorelli3, Liane S. Feldman1,2,4, Marylise Boutros4,5, Lawrence Lee1,2,4, Julio F. Fiore Jr1,2,4

1Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University; 2Centre for Outcomes Research and Evaluation (CORE), Research Institute of the McGill University Health Centre; 3Vita-Salute San Raffaele University, Milan, Italy; 4Division of General Surgery, Department of Surgery, McGill University; Division of Colon and Rectal Surgery, Jewish General Hospital, Montreal.

51. Rate and Predictors of Opioid-free Analgesia After Hospital Discharge Following Colorectal Surgery: A Prospective Cohort Study.

Makena Pook1,2, Ghadeer Olleik1,2, Maxime Lapointe-Gagner1,2, Shrieda Jain1,2, Philip Nguyen-Powanda1,2, Sarah Al Ben Ali1,3, Tahereh Najafi Ghezeljeh1,2, Naser Alali1,3, Katy Dmowski1,2, Samin Shirzadi1,2, Francesca Femi1,2, Pepa Kaneva1,2, Liane S. Feldman1,2,3, Marylise Boutros3,4, Lawrence Lee1,2,3, Julio F. Fiore Jr1,2,

1Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University; 2Centre for Outcomes Research and Evaluation (CORE), Research Institute of the McGill University Health Centre; 3Department of Surgery, McGill University; 4Jewish General Hospital, Montreal.

52. Prosthodontic Rehabilitation Following Maxillary and Mandibular Ablative Resection and Microvascular Reconstructive Surgery: A Retrospective Cross-Sectional Study.

Ameena Nizar Beema1, Jordan Gigliotti2, Karim Botros2, Nour Karra2, Nicholas Makhoul2, Amal Idrissi Janati1,2

1Faculty of Dental Medicine and Oral Health Sciences, McGill University; 2Department of Oral and maxillofacial surgery, MUHC.

53. Impacting Injury Care in Tanzania: The Digital Amber Trauma Registry Experience

1Cherinet Osebo, 1Tarek Razek, 1Dan Deckelbaum, 1Jeremy Grushka 1Kosar Khwaja, 2Victoria Munthali,2Respicious Boniface

1McGill University Health Centre, Centre for Global Surgery, Montreal; 2Muhimbili Orthopedics Institute, Dar es Salaam, Tanzania.

54. The Impact of Gender on Pediatric Surgical Care in Africa

Sacha Williams1,2 Olivia Serhan1 Jenny Wang1 Christian Guindi1 Elena Guadagno2 Maeve Trudeau1,2 Emannuel Ameh3 Kokila Lakhoo4 Dan Poenaru1,2

1Department of Surgical and Interventional Sciences, McGill University; 2Harvey E. Beardmore Division of Pediatric Surgery, Montreal Children's Hospital, McGill University Health Center; 3Department of Pediatric Surgery, National Hospital, Abuja, Nigeria; 4Nuffield Department of Surgical Sciences, Pediatric Surgery, University of Oxford, Oxford, UK.

55. Risk Stratifications for Pediatric Appendicitis: A systematic review.

Mahshid Mortazavi1, Alexandra Dimmer1, Elena Guadagno1, Dan Poenaru1, Sherif Emil1

1Division of Pediatric General and Thoracic Surgery, The Montreal Children's Hospital, McGill University Health Centre.

56. Decoding Dilated Cardiomyopathy: Integrating Plasma Biomarkers for Predictive Insights

Mehran Mottahedi1, Elise Rody2, Ida Derish1,3, Renzo Cecere2

1Department of Surgical and Interventional Sciences, McGill University; 2Department of Surgery, Division of Cardiac Surgery, McGill University Health Center; 3Faculty of Medicine, McGill University.

57. MedSAM-Flow: A Deep Fusion Methodology for Robust Realtime Tracking of Objects in Laparoscopic Videos

Saghar Lafouti1, Liane S. Feldman1, Amir Hooshiar1

1Surgical Performance Enhancement and Robotics Centre (SuPER) Department of Surgery, McGill University

58. Neutrophil-targeted combination therapies to increase immune checkpoint inhibition efficacy in KRAS-mutated LUAD*

Meghan De Meo1, Simrit Safarulla1, Lyndon Walsh1, Muhammad Shahzad1, Catherine Nie1, Roni Rayes1,2, Arvind Chandrasekaran3, Chistopher Moraes4, Sidong Huang2, Simon Milette1, Betty Giannias1, France Bourdeau1, Veena Sangwan1, Nicholas Bertos1, Daniela Quail2, Logan Walsh2, Sophie Camilleri-Broet5, Pierre-Olivier Fiset5, Jonathan Cools-Lartigue1, Lorenzo Ferri1, Jonathan Spicer1,2

1Cancer Research Program, Research Institute of the McGill University Health Center; 2Goodman Cancer Research Center, McGill University; 3North Carolina A&T State University; 4Department of Chemical Engineering, McGill University; 5Department of Pathology, McGill University

***** It will be judged as a Basic Science poster