Inquiry@Queen's

20th

Annual Undergraduate Research Conference

Program

March 12 & 13, 2026
Douglas Library

queensu.ca/iatq

Welcome to Inquiry@Queen's!

It is with great excitement that we welcome you to the **20th Annual Inquiry@Queen's Undergraduate Research Conference**, where we highlight the remarkable work of undergraduate researchers who have embraced the spirit of inquiry by asking bold questions, challenging assumptions, and exploring new perspectives. Organized by the Queen's University Library with support from the Vice-Principal Research Portfolio, this year's conference marks an incredible milestone—twenty years of celebrating undergraduate research! For two decades, Inquiry@Queen's has offered students the chance to showcase their work, ask difficult questions, engage in meaningful discussions, and connect with staff, faculty, and their peers across an array of disciplines.

This year's conference consists of eight presentation sessions, a poster session, and a keynote lecture. Whether through scientific investigation, artistic expression, community-engaged projects, or critical scholarship, each presentation represents countless hours of thought, experimentation, collaboration, and reflection. Through showcasing undergraduates' research achievements, we are reminded how curiosity shapes knowledge and inspires tangible change.

Once again, the two top oral presentations will be awarded the Vice-Principal Research Undergraduate Prize, which celebrates academic rigour, reinforces the commitment to teaching and research integration, and elevates the profile of undergraduate research at Queen's University. Both recipients will receive $1000 each in recognition of their excellent research.

We are also excited to introduce the Queen's University Library Poster Prize, a $250 award granted to the best poster. The poster prize recognizes research that demonstrates originality, clarity, and a commitment to exploring meaningful questions. This award for the top poster highlights the power of undergraduate research to spark new ideas and advance knowledge across disciplines.

After the conference we will announce the award recipients, and all conference presenters' abstracts will be published in this year's Inquiry@Queen's Undergraduate Research Conference Proceedings.

Thank you for joining us and for supporting undergraduate research at Queen's. We look forward to celebrating undergraduate research and discovery!

Sincerely,

The 2026 I@Q Conference Planning Team:

Courtney Svab (Co-Chair), Health Sciences Librarian, Bracken Health Sciences Library
Shelley Woods (Co-Chair), Education Librarian, Education Library
Angélique Roy, Health Sciences Librarian, Bracken Health Sciences Library
Jane Reeves, Scholarly Publishing Coordinator, Stauffer Library
Marion Gonsalves, Reference Assistant, Bracken Health Sciences Library
Traci Allen, Research Program Coordinator, Vice-Principal Research Portfolio

We recognize that Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory and that it is a privilege to learn together on this land.

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Session A: Science I

Thursday March 12, 9:15-10:15 AM

The 1966 Reading Room, Douglas Library

Moderator: Jesse Baker, Research, Instruction & Online Learning Librarian

Addressing Inequities in Sickle Cell Pain Management Through Simulation-Based Interprofessional Education

Presenter: Oluwamisimi Oluwole

Background: Sickle cell disease (SCD) is a genetic haematologic condition characterised by recurrent vaso-occlusive pain crises that require timely and adequate analgesia. Despite well-established clinical guidelines, Black patients with SCD continue to experience delayed, inadequate, and biased pain management within acute care settings. Health professional education often underemphasises the structural and interpersonal factors contributing to these disparities.

Methods: A high-fidelity clinical simulation was developed for nursing and medical students to examine pain management, racial bias, and advocacy in the care of a patient presenting with a sickle cell pain crisis. The simulation required learners to assess severe pain, initiate evidence-based interventions, and navigate interprofessional communication. Debriefing emphasised reflection on bias, power dynamics, and moral distress. Qualitative and quantitative feedback were collected through pre- and post-simulation reflections.

Results: Learners reported increased awareness of implicit bias in pain assessment, greater confidence advocating for adequate analgesia, and improved understanding of systemic barriers faced by patients with SCD. Learners identified discomfort with hierarchical escalation but recognised advocacy as a professional responsibility rather than an exceptional action. Reflections highlighted the emotional and ethical dimensions of caring for marginalised patients experiencing pain.

Conclusion: Simulation-based education offers a powerful approach to addressing inequities in sickle cell pain management by integrating clinical skill development with critical reflection on bias and power. Embedding equity-centred simulations within nursing curricula may better prepare future clinicians to provide compassionate, evidence-based, and just care for patients with SCD.

Turning Carbon Dioxide into Valuable Products Using Protein-Based Materials

Presenter: James Czerkawski
Faculty supporter: Dr. Rachel Baker, Department of Chemical Engineering, Queen's University

The push to reduce greenhouse gas emissions is driving an urgent search for alternatives to fossil fuel-based materials in modern manufacturing. Many current systems depend on metal materials that are expensive and challenging to produce sustainably. One promising solution is to reuse carbon dioxide (CO_2), by turning it into useful products using electricity. This can work under gentle conditions and requires less energy than many traditional chemical processes. As electricity increasingly comes from renewable sources, this approach is becoming even more environmentally attractive.

This project investigates a new material made from protein nanofibers (PNFs), which are small thread-like structures produced from a natural protein found in egg whites. These protein-based materials were used to convert CO and styrene—a common industrial chemical, into hydrocinnamic acid—a valuable substance used in cosmetics and medicine-related products. The proteins were chemically adjusted and studied, then attached to a carbon surface to create the desired material.

The reactions were carried out using a constant electrical current, and the amount of product formed along with how efficiently the electricity was used was measured using chemical analysis techniques. The effect of different materials on the reaction performance was carefully studied, showing that protein-based coatings can help turn carbon dioxide into useful products. Overall, this work demonstrates that materials made from natural, renewable sources can play an important role in cleaner chemical manufacturing. By integrating renewable materials with electricity, this research highlights a pathway towards more sustainable process design, and contributes to the broader effort to decarbonize chemical manufacturing.

Iodide-mediated copper-catalyzed CO2 conversion

Presenter: Aumama Al-Naib
Faculty supporter: Dr. Cao Thang Dinh, Department of Chemical Engineering, Queen's University

With CO2 emission levels on the rise, and the global push to reduce reliance on fossil fuels, there has been a significant and growing interest in CO2 capture, use, and storage technology. One particularly promising process in this field is the electrocatalytic CO2 Reduction Reaction (eCO2RR). This process not only uses waste CO2 as a reactant, but also simultaneously produces economically useful products in the process, and by powering it with renewable energy sources, it ultimately provides a means to close the anthropogenic carbon cycle. Among the many potential eCO2RR products, hydrocarbons are of great interest. This is because hydrocarbons, especially C2+ products like ethylene, are energy-dense chemicals with high market demand and industrial value. Furthermore, hydrocarbon products can be used as fuels within existing infrastructure, making the industrial-scale use of eCO2RR even more

conceivable. Copper catalysts in particular have the unique ability to form multi-carbon products, but there still exists the challenge of designing a system that is highly selective to specific products, important for reducing downstream purification costs, as well as being stable for long operation periods and operating at high current densities, which are both crucial for industrial viability. This project involves investigating how the presence of iodide, known for its effect on the restructuring of copper catalysts, in bicarbonate-based electrolyte influences the selectivity of copper nanowires (CuNWs) to ethylene. To do this, iodide is introduced during the (i) Cu nanowire pre-reduction/activation step and/or (ii) during the actual CO_2 electrolysis reaction. The gaseous products are quantified using gas chromatography to determine their faradaic efficiencies. Preliminary results reveal not only the influence of iodide on CuNW surface morphology and product selectivity, but the critical nature of the timing of iodide introduction. These findings can provide guidance for designing iodide-mediated copper-catalyzed CO2 electroreduction processes for ethylene production.

Electrochemical Fatty Acids Decarboxylation Using CO2 Switchable Water

Presenter: Clara Whittle
Faculty supporters: Dr. Rachel Baker, Chemical Engineering & Dr. Philip Jessop Chemical Department of Chemistry, Queen's University

Many household cleaning products and cosmetics, such as Lysol and CeraVe, include a group of chemicals known as fatty alcohols. Their extensive use in products resulted in a global market value of USD 6.97 billion in 2025. Currently, the majority of fatty alcohol production is done via two industrial methods. The petroleum-based pathway chemically converts fossil fuels into fatty alcohols, whereas bio-mass conversion utilizes materials like rapeseed and oil palm trees. Although both methods are well-established, they present environmental challenges. Production of fatty alcohols using petroleum is the less expensive option, but it relies on a non-renewable resource that will eventually be fully exhausted. While bio-derived feedstocks are renewable sources that come from plants, the conversion process to fatty alcohols is a point of criticism. This process uses metal-containing chemicals, which are not only expensive, but contribute to the carbon footprint through their production. Additionally, these reactions are run at high temperatures, consuming large amounts of energy.
The goal of this research is to establish a more sustainable approach by utilizing renewable resources and a cleaner conversion process through electrochemistry and a reusable solvent. Solvents are a liquid medium where the reaction will take place. Typically, they are used only once and then discarded. By creating a reusable solvent, waste production is reduced and the system is more cost-effective. Electrochemistry uses electricity to drive the formation of fatty alcohols, eliminating the need for metal-containing chemicals and intense temperatures. Furthermore, this could be integrated with renewable energy sources like solar power to enhance sustainability. This new framework offers a more efficient and environmentally responsible path for producing fatty alcohols needed for consumer goods.

Hydrogel-Based Biosensors for Early Pathogen Detection

Presenters: Allie Goodyear, Roka Pringle, Ramin Imran

Bacterial plant pathogens are a major challenge to agricultural production, causing substantial crop and economic losses worldwide. In Canada, plant disease is a significant threat to valuable crops, and as Canada's largest vegetable crop, potatoes contributed to $2.1 billion in gross income for Canada in 2024.

Potatoes are particularly difficult to monitor for disease, as they are grown underground and show few, if any, visible symptoms until harvest. As a result, infections are often identified only after significant yield or quality losses have occurred. Current plant pathogen detection methods rely primarily on visual inspection or laboratory-based culture and molecular techniques such as PCR, which are costly and impractical for continuous, in-field monitoring.

To address these challenges, we developed a prototype multi-signal biosensor designed for early and continuous pathogen detection in agriculture systems. Our system uses genetically engineered Cupriavidus necator bacterial cells suspended in hydrogel to fluorescently detect multiple early indicators of plant infection in soil. The three markers include pathogen-derived quorum-sensing molecules called acyl-homoserine lactones (AHLs), jasmonic acid associated with plant stress responses, and coronafacic acid, a precursor to the plant toxin coronatine produced by many bacterial plant pathogens. Integrating multiple signals increases detectability and reduces false positives. Fluorescent light emissions from the cells upon binding target molecules would be captured using a camera connected to a Raspberry Pi computer, enabling image analysis to determine pathogen presence and real-time digital alerts to notify farmers of potential infections.

Due to financial limitations, this project focused on designing, printing, and testing the Raspberry Pi and camera without genetically modifying cells. However, our model demonstrates a realistic and scalable approach to early pathogen detection. This work highlights the potential for low-maintenance, multi-signal biosensors to transform pathogen monitoring and enable earlier intervention in agricultural production, filling this market gap.

Session B: Global Studies, Political Studies, Philosophy

Thursday March 12, 10:30-11:30 AM

The 1966 Reading Room, Douglas Library

Moderator: Deirdre Bryden, Archivist (University Records)

Justice for Whom? Water Infrastructure, Fossil Futures, and the Politics of Care in Lephalale, South Africa

Presenter: Maya Iyonmana
Faculty supporter: Dr. Marc Epprecht, Department of History, Queen's University

South Africa's post-apartheid "just transition" discourse promises a socially inclusive shift toward a low-carbon future. Yet in Limpopo Province, large-scale water infrastructure continues to secure resources for coal-fired power generation while surrounding communities experience persistent water insecurity. This paper examines the Mokolo and Crocodile Water Augmentation Project (MCWAP), a major inter-basin transfer scheme designed to supply water to Eskom's Medupi Power Station and associated mining operations. Although framed as an environmental compliance intervention, MCWAP reflects broader contradictions within South Africa's mineral-energy complex.

Drawing on two months of fieldwork conducted in 2025 – including semi-structured interviews, a focus group with community members from Lephalale and surrounding villages, interviews with municipal water officials in Thabazimbi, and informal discussions with landholders and community members – this study explores how large-scale water infrastructure is experienced at the local level. Findings show that despite proximity to major water and energy infrastructure, residents rely on informal pipeline connections, tanker deliveries, water storage, and illegal boreholes to secure daily water access. Scarcity emerges not as a simple absence of infrastructure, but the outcome of allocation decisions that prioritize industrial demand over community-level needs.

Building on political ecology scholarship and the concept of "liquid violence," this paper argues that MCWAP redistributes risk and responsibility through technocratic governance arrangements that obscure accountability and normalize uneven access. While communities sustain everyday life through practices of care and informal adaptation, institutional reform remains absent. Rather than an isolated governance failure, MCWAP reflects a broader pattern of infrastructure-led development in which technical solutions obscure political choices about allocation, power, and whose water matters. A just transition, this research argues, requires institutional redesign, democratic participation, and the decoupling of water governance from extractive imperatives – so that care is institutionalized, not left to communities to absorb infrastructural harm.

Abortion Down the Ballot: How States Responded to the Dobbs Decision in the 2024 General Election

Presenter: Claire Dudley
Faculty supporter: Dr. Fan Lu, Department of Political Studies, Queen's University

This research examines the impact of the Dobbs v. Jackson Women's Health Organization Supreme Court decision on the 2024 U.S. elections. In said election cycle, the Democratic Party reinforced abortion as a key topic in their messaging, yet fell short at the vote. Causal interpretation could argue that the majority of Americans are either pro-life and hence felt a negative reaction to the campaigning, or alternatively, did not deem abortion as a motivating factor in their vote choice. However, both of these claims conflict with statistical evidence that the American population identifies as pro-choice at the highest recorded rates in history, and more than half of voters indicated that abortion was influential in their election decision.

This research specifically addresses the question: How was state-level voting in the 2024 U.S. general election influenced, down the ballot, by the 2022 Dobbs decision and subsequent political activism? The analysis integrates Carmines and Stimson's easy-issue theory as the core theoretical approach. A quantitative measure is used to understand results at the state level, specifically through R analysis. Notably, a self-made dataset on abortion policy, voter turnout, protest prevalence, and election results is utilized.

Through regression analysis, the results of this research indicate a new wave in the connection between abortion policy and election outcomes. Existing literature argues that abortion has been a salient issue in elections, with pro-choice candidates historically benefiting from integrating their position into their campaign. However, these results indicate that while a vast majority of people continue to indicate a high issue salience of abortion, the influence is not influential in the voting booth in a manner that could sway election results. Rather, abortion was a reinforcement value of partisanship in the 2024 election cycle. This indicates a decrease in the implications and impact of abortion campaigning.

Ideal Immigrant or Not? A Vignette Survey of Affordability Pressures and Hostility Toward International Students in Canada

Presenter: Rissa Wang
Faculty supporter: Dr. Boyoon Lee, Department of Political Studies, Queen's University

International students (IS) have long been framed as the "ideal immigrant" in Canada: highly educated, economically productive, and well-positioned for labour market demands. However, recent policy changes, including more restrictive study permit regulations and efforts to reduce temporary resident numbers, have made IS an increasingly visible and contested group within Canadian public debate. In the post-COVID era, rising housing costs, strained public services, and broader affordability pressures have intensified narratives that link IS not only to higher education but also to a substantial competitor in the job market and resources under some framing. This development raises an important question: Does worsening living affordability contribute to higher hostility toward IS, and if so, why?

This research investigates how economic conditions shape Canadian public attitudes toward international students through the lens of affordability-based economic threat. The project asks: (1) Does deteriorating affordability increase hostility toward IS? (2) Under identical affordability conditions, do IS receive greater hostility than permanent immigrants? and (3) What mechanism(s) may explain these patterns? I argue that worsening affordability activates economic threat perceptions, encouraging individuals to attribute scarcity in housing, employment, and public resources to outsiders or out-groups. IS may become a particularly salient target compared to immigrants because of their temporary status, their perceived limited long-term contribution, and their ambiguous membership in relation to accessing public services.

To test these expectations, the study employs a vignette-based survey experiment that manipulates local affordability conditions and different citizenship status groups in a fictional setting. This design enables causal evaluation of whether affordability pressures heighten exclusionary attitudes, and whether such attitudes differ across migrant categories. By extending economic threat theory to temporary residents, this research contributes to scholarship on migration attitudes, political behaviour, and the distinctive positioning of international students in contemporary Canada.

Deportation ASMR: Digital Spectacle and Racialized Capitalism

Presenter: Vaishnavi Suganthan

This paper examines a forty one second White House video titled "Deportation ASMR," which combines the soothing conventions of ASMR with footage of shackled migrants boarding a deportation flight. It asks why contemporary state media increasingly aestheticizes coercion and how such spectacles allow capitalism to transform racialized expulsion into entertainment and profit. Drawing on interdisciplinary scholarship on racial capitalism and surveillance capitalism, particularly the work of Cedric Robinson, Jodi Melamed, and Shoshana Zuboff, the analysis situates the video at the intersection of state power, digital culture, and platform based monetisation. Through close visual and auditory analysis and examination of the video's circulation and reception online, the paper traces how aesthetic techniques shape public interpretation of state violence.

The analysis shows that the ASMR format normalises deportation by enclosing viewers in a calm sensory environment that reframes forced removal as orderly, routine, and emotionally neutral. This aesthetic strategy masks the racialized violence of deportation and presents it as bureaucratic maintenance rather than coercive state action. At the same time, the video's viral circulation ensures that every reaction, whether outrage, approval, or curiosity, is converted into valuable behavioural data. These interactions are processed by platform algorithms, demonstrating how surveillance capitalism profits from controversy while amplifying state narratives. The paper argues that "Deportation ASMR" is not an isolated publicity misstep but an emerging model of state communication that sanitizes racialized governance while exploiting attention economies. This research highlights how interdisciplinary undergraduate inquiry can use critical analysis of contemporary media to reveal hidden power structures shaping everyday political life. By exposing the political economy underlying this digital spectacle, the study offers a framework for analysing future instances of state sponsored viral media and the growing fusion of digital marketing techniques with exclusionary statecraft.

Conspiratorial Populism: Donald Trump, the Erosion of Expertise, and Democratic Backsliding in the United States

Presenter: Dorigen Gray

Conspiracy theories have long existed on the margins of political life, but their consequences shift dramatically when they enter the mainstream, and, more critically, when they are embedded within institutions responsible for producing and safeguarding authoritative knowledge. This is exactly what one can see occurring in the United States under President Donald Trump's leadership, where political authority is no longer justified through democratic institutional norms or expertise, but through accusations and claims that represent the will of the 'true-American people'. In this presentation, I will argue that Trump's populist-conspiratorial leadership has normalized the presence of conspiracy theories within government institutions traditionally associated with epistemic authority and expertise. Consequently, this has resulted in the erosion of democratic institutional authority and contributed to democratic backsliding, as the interplay of concentrated power, populist claims, and conspiratorial narratives destabilizes the epistemic foundations of democratic governments. My analysis will begin with tracing Trump's rise as a populist leader in 2016 and the persistence of conspiratorial rhetoric following the 2020 election and into his second term. Next, I will demonstrate how conspiracy theories function most effectively alongside populist discourse, reinforcing narratives that delegitimize institutional expertise while consolidating political power. Building on this, I will present how the institutional endorsement of conspiratorial claims by Trump undermines traditional sources of epistemic authority, weakening public trust in democratic knowledge-producing institutions. Finally, I will reveal that this current dynamic in the United States contributes to democratic backsliding by destabilizing its democratic standards, practices, and media pluralism, creating pathways through which conspiratorial populism reshapes political processes. Overall, this presentation will highlight how the mainstreaming of conspiracy theories within governing institutions is dangerous, in its ability to threaten epistemic accountability and democratic resilience, underscoring the necessity of robust institutional checks to ensure democratic governance serves the public interest rather than partisan power.

Poster Session (Lunch with Posters)

Thursday, March 12, 11:30AM – 1:00 PM

The 1966 Reading Room, Douglas Library

Is Vitamin D the Missing Link? Progesterone Signaling and Racial Disparities in Uterine Leiomyoma Pathogenesis

Presenter: Serena Adekokuronile

Background: Uterine leiomyomas (UL) are the most common benign pelvic tumors in women of reproductive age, affecting up to 80% by age 50 and serving as a leading cause of heavy menstrual bleeding, pelvic pain, and hysterectomies. While progesterone is a recognized promoter of UL proliferation, evidence suggests hypovitaminosis D may act as a permissive factor by modulating progesterone receptor expression. This is particularly relevant for Black women, who face a threefold higher UL prevalence and disproportionately lower serum 25-hydroxyvitamin D [25(OH)D] levels, suggesting a biological contribution to observed disparities.

Objectives: Uterine leiomyomas (UL) are the most common benign pelvic tumors in women of reproductive age, affecting up to 80% by age 50 and serving as a leading cause of heavy menstrual bleeding, pelvic pain, and hysterectomies. While progesterone is a recognized promoter of UL proliferation, evidence suggests hypovitaminosis D may act as a permissive factor by modulating progesterone receptor expression. This is particularly relevant for Black women, who face a threefold higher UL prevalence and disproportionately lower serum 25-hydroxyvitamin D [25(OH)D] levels, suggesting a biological contribution to observed disparities.

Methods: This exploratory secondary analysis synthesized clinical and molecular studies (2015–2026) examining serum 25(OH)D levels, progesterone receptor expression, and VDR polymorphisms to assess associations between Vitamin D deficiency, tumor burden, and racial disparities.

Results: Analysis confirms a significant inverse correlation between 25(OH)D levels and UL volume. Mechanistically, Vitamin D3 downregulates PR-B isoforms and inhibits TGF-beta3-mediated fibrosis. In Black cohorts, the intersection of chronic deficiency (<20 ng/mL) and VDR polymorphisms (e.g., FokI) appears to remove a critical genomic brake, leading to unchecked progesterone-mediated growth.

Conclusion: Vitamin D deficiency likely amplifies progesterone-associated growth pathways, contributing to severity disparities. Addressing this deficiency offers a high-impact, low-cost pathway to mitigate disproportionate surgical burden and racial inequities. Further longitudinal trials are needed to define specific therapeutic thresholds.

Understanding Indigenous Students' Perceptions of Holistic Wellness and Balance in First-Year Post-Secondary Education

Presenters: Harini Arulvarathan, Stefany Alter, Ashley Petruccelli
Faculty supporters: Julia Moreau, Luis Flores, Department of Psychology, Queen's University

For Indigenous students, the first year of post-secondary education can be more than an academic shift; it is a complex period of resilience amid barriers in institutions shaped by ongoing colonial legacies. Gaps remain in understanding holistic wellness disparities experienced by Indigenous post-secondary students relative to non-Indigenous peers, including depression, anxiety, substance use, and self-harm. Guided by Two-Eyed Seeing (i.e., balancing Indigenous and Western ways of knowing) and the medicine wheel, this study conceptualizes holistic wellness across four interconnected domains: spiritual, emotional, physical, and mental. Working with Indigenous students who report difficulty accessing the curriculum and/or mental health challenges, this research aims to better understand their perceptions of what contributes to and undermines their holistic wellness and balance in first-year, post-secondary contexts.

Ten first-year post-secondary students (30.7M age; 50% women) completed a self-report survey that formed a part of a larger mixed-methods photovoice study. Reflexive thematic analysis will analyze open-text responses and identify important themes regarding holistic wellness. Relevant descriptive and inferential statistics regarding perceived balance and factors that support and hinder Indigenous students' spiritual, emotional, physical and mental wellness will also be reported.

The current project aims to deepen the understanding of intersecting cultural, holistic wellness, and barriers to accessing the curriculum that shape first-year Indigenous students' experience. Findings will be returned to Indigenous students' post-secondary communities and research partners to support shared learning and systems-level change that strengthens culturally responsive and community-validated holistic wellness supports.

Childhood Maltreatment as a Predictor of Depression-Anxiety Coupling Strength

Presenter: Jordana Bard
Faculty supporter: Dr. Kate Harkness, Department of Psychology, Queen's University

Major depressive disorder (MDD) and anxiety disorders are among the most common psychiatric conditions, with their co-occurrence associated with increased severity, functional impairment, and relapse risk. However, not all individuals with depressive symptoms experience co-occurring anxiety symptoms, highlighting the need to identify mechanisms that explain this variability. Childhood maltreatment, including emotional, physical, and sexual abuse and neglect, is a well-established transdiagnostic risk factor for internalizing psychopathology, yet its role in shaping dynamic co-occurrence of symptoms and disorders remains poorly understood. This study will examine childhood maltreatment as a predictor of Depression-Anxiety Coupling Strength (DACS), a construct reflecting

the extent to which fluctuations in anxiety and depressive symptoms co-vary over time. Archival data (N=250) will be drawn from the LAUREL cohort in the Mood Research Laboratory at Queen's University. Participants completed the Childhood Experience of Care and Abuse (CECA) interview at baseline and the Mood and Anxiety Symptom Questionnaire (MASQ-D30) at two follow-ups over eight months. Multilevel modeling (MLM) will estimate within-person DACS and test whether childhood maltreatment severity and subtype predict stronger coupling and more persistent symptom trajectories. I hypothesize that individuals with greater childhood maltreatment severity, particularly severity of emotional abuse and neglect, will exhibit stronger DACS, reflecting greater temporal coupling between depression and anxiety symptoms. Clarifying how early adversity shapes these dynamic processes may enhance prediction of illness trajectories and inform more precise interventions for individuals who experience comorbidity.

The Cancer-Related Experiences of Visible Minorities in Canada: A Scoping Review

Presenters: Rishta Bhusal, Falaq Mansuri
Faculty supporter: Dr. Jacqueline Galica, School of Nursing, Queen's University

Background: Cancer care is multifaceted, encompassing screening, diagnosis, treatment, and survivorship. While advances in research have led to improved cancer care experiences, social determinants of health influence health outcomes, revealing disparities among marginalized populations. Of note, visible minorities experience socio-contextual and systemic barriers to care. Despite increased attention to these inequities, relevant literature has not been synthesized, revealing a need for a comprehensive review. This scoping review aims to understand the following objectives: 1) To determine how visible minorities are defined and/or described, 2) To identify which visible minorities have been studied, and 3) to summarize what is known about the cancer-related experiences of visible minorities.

Methods: Using JBI scoping review methods, a literature search was initially completed in May 2023 and updated in September 2025, where a noticeable increase in publications was observed. MEDLINE, Embase, Epistemonikos, PsycINFO and CINHAL were used to conduct the search. Eligible studies include primary and population-based research that reports cancer care experiences of visible minority groups in Canadian adults. Studies focusing solely on pediatric populations (<18 years of age) were excluded. Two reviewers independently screened title, abstract, and full text. Disagreements were resolved through discussion until consensus was reached. Data extraction and analysis will be completed in alignment with the research objectives.

Results: After duplicates were removed, 2876 articles were screened, of which 44 studies met the eligibility criteria and were included for data extraction. Preliminary results reflect a diversity of cancer diagnoses across Canada. Synthesized results will undergo thematic analysis to answer study objectives and identify gaps in the literature.

Conclusion: Review results would underscore the available research on cancer-related experiences of visible minority populations across Canada. Results would highlight the need for future research where the experiences of visible minorities are applied to inform culturally competent care in clinical practice and policymaking.

Red Flags or Green Lights: How Trigger Warnings Shape Self-Harm-Related Content and Engagement on TikTok

Presenter: Alessia Cataudella

Self-harm and suicide are growing concerns among Canadian adolescents, and social media platforms like TikTok can influence youths' mental health. Harmful online content may lead to the spread of maladaptive thoughts and behaviours, such as the imitation of self-harm itself, with these risks amplified by unregulated digital environments and limited platform accountability. Trigger warnings (TWs) are used to flag this potentially distressing material, yet evidence regarding their effectiveness is mixed – some studies suggest they may increase anticipatory anxiety or engagement with warned-about content. Further, the majority of TW research focuses on viewer experiences rather than the creator's usage of these warnings. This study explores how TWs are used in suicide and self-harm-related TikToks, whether they influence engagement, and how content differs with and without TWs. A purposeful sample of 102 self-harm-related TikTok videos (51 with TWs, 51 without) was collected by searching "#sh" (denoting self-harm) in the TikTok search bar on a factory-reset device. Engagement metrics (views, likes, comments, shares, bookmarks) were extracted and compared between the groups, and the TW format (caption, text on screen, verbal, hashtag) was identified. A qualitative content analysis was performed to compare thematic differences between videos containing TWs and those without. Contrary to expectations, videos without TWs had significantly higher engagement across all metrics. This suggests that content lacking warnings is either more widely promoted by the algorithm or more appealing to viewers. TWs were also applied inconsistently, raising concerns about the visibility of potentially harmful material. Although the content analysis is ongoing, early findings point to a high prevalence of graphic content and distressing messaging in self-harm-related videos, regardless of TW presence. Taken together, these results highlight the need for clearer online content moderation strategies and ultimately empower youth to make informed autonomous choices about their engagement with self-harm content online.

Chlorofluorocarbon Emissions and Non-Melanoma Skin Cancer Incidence in Europe: A Retrospective Epidemiological Correlational Analysis

Presenter: Selina Chenyue Wang

Introduction: Stratospheric ozone protects against biologically harmful ultraviolet (UV) radiation by absorbing wavelengths implicated in cellular mutagens, including cyclobutane pyrimidine dimers and 6-4 photoproducts. Regions experiencing ozone depletion consequently exhibit higher ground-level UV exposure and increased burden of UV-associated disease, including non-melanoma skin cancer (NMSC). Chlorofluorocarbons (CFCs) are synthetic halogenated compounds undergoing UV photolysis in the stratosphere, releasing reactive chlorine species that catalytically destroy ozone. Despite global phase-out under the 1987 Montreal Protocol, the atmospheric persistence of CFCs (55-140 years) perpetuates continued ozone depletion. Given the strong etiologic role of UV radiation in NMSC, this study examined the association between historical CFC emissions and subsequent population-level NMSC incidence in European countries.

Methods: A retrospective correlational analysis was conducted using secondary data. National 1986 CFC emissions data was obtained from the United Nations Environment Programme database, representing emissions levels prior to the implementation of ozone protection policies. NMSC incidence estimates for 2018 were extracted from GLOBOCAN and operationalized as age-standardized rates per 100,000 males. This temporal lag accounted for plausible biological and environmental latency. Analyses were restricted to 28 European countries to improve climatic comparability. Outliers were assessed using Tukey's rule, and Pearson's correlation coefficient was computed using IBM SPSS.

Findings: After the exclusion of two influential outliers, a moderately positive correlation was observed between 1986 CFC emissions and male NMSC incidence in 2018 ($r=0.495$, $p=0.010$; $R^2=0.245$). These findings provide population-level evidence consistent with the mechanistic pathway linking ozone-depleting emissions to downstream skin cancer burden. While the association explains a modest proportion of variance, it underscores the long-term public health relevance of ozone protection policy and highlights the need for covariate-adjusted, longitudinal analyses to better quantify risk in international NMSC surveillance.

Evaluation of Chemotherapy Induced Erythrocyte Injury Beyond Routine Blood Counts Using Peripheral Blood Smears and MIZAR® Syllectometry

Presenter: Caroline Ding
Faculty supporter: Dr. Maha Othman, Biomedical and Molecular Sciences, Queen's University

Introduction: Chemotherapy exerts substantial cytotoxic effects that impair quality of life in patients with cancer. Prior studies documented chemotherapy-associated erythrocyte (RBC) membrane toxicity and abnormal morphology, while recent work using MIZAR® Syllectometry demonstrated that a single cycle significantly impairs RBC elasticity and deformability. We aimed to characterize chemotherapy-

associated RBC morphological abnormalities and examine their associations with hematological indices and RBC biomechanics.

Methods: Peripheral blood smears were obtained from women with cancer before and after the first chemotherapy cycle (15 patients; 30 smears). Smears were examined by light microscopy at 100× oil immersion using a predefined protocol. Per smear, 140-180 erythrocytes from randomly selected fields were manually graded into predefined abnormal morphology categories. Morphological changes were assessed in relation to complete blood count (CBC) parameters and RBC elasticity and deformability measured by MIZAR® Syllectometry pre- and post-chemotherapy.

Results: Median abnormal erythrocytes increased from 19.4% (IQR 14.0-22.0) to 23.9% (IQR 17.3-26.7) following cycle one, with a median paired increase of +4.7% (IQR 0.8-10.5), which was statistically significant (Wilcoxon signed-rank V=102, p=0.018). Changes did not differ by cancer type (all p>0.4), and no individual morphology category reached significance. Inter-rater agreement was excellent (ICC=0.995 total cells; ICC=0.993 abnormal cells). HB, MCV, and RDW showed no significant changes (all p>0.10). RBC biomechanics shifted significantly, with reductions in distribution integral (1878±537 vs. 1567±475; adjusted p=0.032) and base point low (184±29 vs. 161±25; adjusted p=0.032), while redistribution peak remained unchanged (p=0.108). Morphological changes did not correlate with biomechanical parameters (all p>0.08).

Conclusions: Peripheral blood smears detect significant RBC morphological abnormalities early during chemotherapy despite stable CBC indices. Concurrent biomechanical impairment supports early functional and structural RBC injury. This suggests chemotherapy-associated RBC damage precedes routine hematologic abnormalities and support smear morphology as a feasible and reproducible early detection tool warranting validation in larger cohorts.

Investigating Microglia Phenotype at the Chronic Stage of Ischemic Stroke After Gene Therapy with AAV-NeuroD1

Presenter: Naomi Hawreluk
Faculty supporter: Dr. Douglas James Cook, Department of Surgery, Kingston Health Sciences Centre

Ischemic stroke remains a leading contributor to mortality and long-term neurological disability worldwide. While improvements in emergency care have increased survival rates, most effective clinical interventions are largely restricted to the acute phase of injury. As a result, increasing attention has shifted toward understanding cellular processes that influence tissue remodelling and recovery during the chronic stage. Microglia, the resident immune cells of the central nervous system, play a critical role in shaping recovery outcomes, yet their behaviour during the chronic stage of stroke remains poorly defined. An increasingly compelling area of research has investigated regenerative gene therapies. One such therapy involves adeno-associated virus (AAV) mediated delivery of the transcription factor NeuroD1, which has demonstrated robust neuroregenerative effects in both rodent and non-human primate models of ischemic stroke, including increased neuronal density and reduced gliosis. Despite

these promising outcomes, the impact of NeuroD1 treatment on microglial populations during the chronic stage of stroke is not well understood. The present study investigates microglial distribution and phenotype in chronic-stage ischemic stroke tissue following AAV-NeuroD1 gene therapy in non-human primates. Brain tissue collected nine months after transient middle cerebral artery occlusion was immunolabeled for Iba1 to identify microglia and counterstained with DAPI to label nuclei. Quantitative image analysis was performed to assess microglial density and spatial distribution in ipsilateral, stroke-affected regions compared to contralateral control regions, as well as across control, low-titer, and high-titer NeuroD1 treatment groups. By examining microglial patterns in chronically injured tissue, this study provides foundational insight into how regenerative gene therapy may influence the long-term neuroimmune environment after stroke.

A Mixed Methods Program Evaluation of a Student-Led Inclusion Initiative for Adults with Intellectual and Developmental Disabilities

Presenter: Daniel Jafari

Opportunities for community-based social engagement remain limited for individuals with intellectual and developmental disabilities. Friday Friends is a student-led program that brings together university student volunteers and individuals with intellectual and developmental disabilities for weekly social and recreational activities with the goal of promoting community engagement. As the program continues to grow, a structured evaluation is needed to assess its effectiveness and sustainability. This evaluation was guided by the question: How effectively does Friday Friends support participant inclusion and volunteer experience, and what opportunities exist for program improvement?

A mixed-methods program evaluation design was used. Anonymous surveys were distributed to participants, student volunteers, and executive members. Survey items were informed by validated measures commonly used in program evaluation. Quantitative items used 5-point Likert scales, while open-ended questions captured qualitative feedback. Attendance data were also collected across eleven program meetings from September 2025 to February 2026. Survey and attendance data were analyzed using descriptive statistics and thematic analysis. This project was conducted for quality assurance and quality improvement purposes and deemed exempt from Research Ethics Board review under TCPS 2 Article 2.5.

Attendance data from participants (n=15) and volunteers (n=17) demonstrated sustained engagement over time, with participants showing higher attendance at off-campus activities, while volunteer attendance was more evenly distributed across locations. Survey responses from participants (n = 8), volunteers (n = 13), and executive members (n = 5) showed consistently high ratings of satisfaction. Participants reported feeling socially connected and consistently enjoyed activities and interactions with volunteers. Volunteers reported a positive impact on participants, alongside gains in communication skills and understanding of inclusion and accessibility. Executive responses identified strong community culture, while noting logistical challenges. Future research should incorporate

caregivers' perspective and examine predictors of volunteer retention using larger samples and longitudinal designs.

New Century, Same Problem: Institutionalized Racism as a Form of Neo-Imperialism

Presenter: Lyane Lariviere

This paper explores how institutionalized racism functions as a form of neo-imperialism by analyzing the political economy of Israel and its treatment of the Palestinian workforce. Motivated by the need to reassess how imperialism persists in the twenty-first century, particularly through the racialization of labour in liberal-democratic states, the paper builds on Immanuel Wallerstein's Historical Capitalism and his concept of the ethnicization of labour. I argue that capitalist systems continue to exploit racialized groups to maintain unequal power relations, positioning Israel as both a product and agent of historical capitalism. Under the guise of liberal democracy, Israel systematically marginalizes Palestinians through a racialized division of labour that reproduces colonial structures of domination. Methodologically, this paper combines a critical literature review with a theoretical application of Wallerstein's mechanism, focusing on three key mechanisms: labour flexibility, cost-saving socialization, and occupational stratification. Drawing on interdisciplinary academic sources in international relations, critical race theory, and settler-colonial studies, I closely examine how Israel's economic, legal, and social institutions function to ethnicize labour and maintain dominance. This paper critically engages with scholarly debates in international affairs, challenging neoliberal and realist narratives that obscure these inequalities. I further assess the profound implications for democracy, as Israel's legal and policy frameworks deliberately reinforce ethnic exclusivity while diminishing Palestinian politico-economic agency: an analysis which is particularly relevant given the global resurgence of nationalist and exclusionary state policies. Ultimately, this paper affirms the pertinence of Wallerstein's framework in understanding global capitalism and exposes how neo-imperial practices persist in the modern era, especially in settler-colonial contexts. I call for renewed attention to the interconnectedness of race, capitalism, and imperialism in analyzing contemporary international political economy.

Blame by Association: The Role of Group Membership and Moral Foundations in Blame Attribution

Presenter: Jessica Lee
Faculty supporter: Dr. Stanka Fitneva, Department of Psychology, Queen's University

Blame assignment is not confined to the perpetrators of blameworthy events. Studies on attitude transfer and collective responsibility have found that blame can spread from perpetrators to their associated groups. However, little is known about whether this blame extends to the individual members of these associated groups (rather than the group abstractly) and what factors influence this process.

This study investigates whether mere association with a perpetrator leads to blame attribution and whether an individual's moral foundations scores are associated with this spread of blame. Participants will be presented with a series of vignettes depicting blameworthy transgressions involving four characters: an aggressor, accomplice, uninvolved group member, and an uninvolved nongroup member. After reading each vignette, participants will be asked to assign blame to the various story characters. They will then be presented with the Moral Foundations Questionnaire (MFQ-2). The MFQ-2 will be used to explore whether higher binding moral foundation scores are associated with increased blame attribution to an uninvolved group member, compared to a nongroup member. Past studies have found evidence that binding foundations are related to the spread of blame to victims, however, there has not been a study investigating whether these foundations are related to the spread of blame to those who are uninvolved and unassociated with the perpetrator.

We expect that blame attribution will be influenced by both association with the aggressor and an individual's scores on the binding moral foundations. Understanding what facilitates the spread of blame may inform legal practices by highlighting how moral foundations bias how blame, and therefore punishment, is assigned to those on trial. This could contribute to the development of future legal training and guidelines aimed at minimizing these biases.

Risk factors associated with delayed speech-language development in preterm infants: A scoping review

Presenter: Jillian Morris
Faculty supporter: Dr. Sandra Fucile, Department of Pediatrics & School of Rehabilitation Therapy, Queen's University

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Introduction: Though scientific and technological advancements in perinatal and neonatal care have increased survival rates amongst preterm infants, infants born preterm remain at heightened risk of delayed speech-language development due to organs and system immaturity at birth.1-4 Speech-language impairment is the most prevalent neurodevelopmental impairment in extremely preterm (EP) infants, yet the relationship between developmental trajectory, infant morbidities, environmental factors, and language outcomes remains unclear.3,4 The aim of this scoping review is to assess risk factors associated with delayed speech-language development in infants born preterm (<37 weeks' gestation).

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guideline was applied. Articles had to be published in peer-reviewed journals between 2000 and 2025, have a study population of preterm infants with speech-language delay, and assess biologic and environmental risk factors associated with delayed speech-language development in children born preterm. A total of 307 articles were sourced across CINAHL, Cochrane, EMBASE, Ovid Medline, and PsycInfo, with 122 duplicates removed through Covidence.

Result: After abstract and full-text screening, 14 articles meeting the inclusion criteria were included in this study. Findings identified that biological factors including gestational age and birthweight are

significant risk factors, and environmental factors including family income, toy availability, breast milk, and insurance as potential risk factors for speech-language delay in preterm infants.2,3

Conclusion: Speech-language development in preterm infants is not only explained by biological risk factors (gestational age, birthweight, sex), but also environmental risk factors (family income, toy availability, maternal factors).

The Therapeutic Impact of Music on Memory Rehabilitation for Patients with Cognitive Decline

Presenter: Taran Pabla

Cognitive impairment caused by neurodegenerative diseases such as Alzheimer's poses a challenge to the retention of memories and emotional state. The pharmacological management of such patients has shown poor efficacy in restoring memory functions. However, non-pharmacological management such as music therapy has shown promise for the rehabilitation of patients with cognitive impairment. This report aims to discuss the importance of music therapy for patients with cognitive impairment caused by neurodegenerative diseases, including its neurological and psychological effects on the patients and its therapeutic value for their recovery. The report is a result of a mixed approach to literature review and the use of the COBWEB agent-based simulation platform. In addition, the literature review identified various aspects related to rhythm, melodies, and familiarity of lyrics that have a significant effect on autobiographical memory, emotional regulation, and neural activation. Computational simulations were conducted to understand neurodevelopment, amyloid beta aggregation, and neurodegeneration. The literature review has identified various aspects related to memory recall, mood, agitation, and neural pathways that are activated with the use of music therapy in patients with dementia. Personalized and active musical engagement was identified as particularly effective. Computational modelling was used to further demonstrate the deterioration of neural connectivity during the progression of the diseases. This research further supports the use of music therapy as a low-risk intervention that is accessible and effective as a complementary intervention for memory rehabilitation, emphasizing the potential for this intervention in clinical and long-term care settings.

Indigenous Homelessness and Chronic Illness in Kingston, Ontario: A Composite Case Study

Presenters: Luka Parikh, Misu Tamaki, Paul Cseke

Colonialism, systemic racism, and intergenerational trauma continue to shape the Indigenous homeless population in Kingston. Of the 531 individuals actively experiencing homelessness in Kingston, over 23% identify as First Nations, a figure that represents a pronounced overrepresentation relative to their share of the city's population. This study applies a composite narrative case study to examine how the accumulation of structural and systemic barriers disproportionately affecting Indigenous Peoples contributes to elevated rates of homelessness and restricted access to healthcare. In alignment with Indigenous knowledge systems that emphasize collective experience and ethical storytelling, eight

first-person stories were gathered from Indigenous individuals experiencing homelessness in downtown Kingston. Information was gathered through informal conversations and shared through organizations affiliated with the Kingston Homeless Alliance (KHA), a student-run organization that supports unhoused individuals through outreach and advocacy. Informed verbal consent and anonymization procedures were used, including assigning a pseudonym for the case study. These accounts were synthesized into a single representative narrative to capture the barriers quantitative data often misses. The case study presents the narrative of Aiyana, a 34-year-old Indigenous woman experiencing homelessness in Kingston while caring for her young son and managing type 2 diabetes. Ultimately, the takeaway is that access to housing and safety is shaped by unstable shelter, food insecurity, and healthcare stigma, which deters individuals from seeking essential services. By drawing on lived narratives to identify community gaps, this educational case study demonstrates how healthcare stigma can delay assessment and drive avoidance. The results encourage open-minded discussion and underscores the urgent need for Indigenous-led, trauma-informed approaches including Indigenous-run housing supports, and culturally safe primary care partnerships to improve homelessness and healthcare access in Kingston.

Music and Movement Program for Older Adults in a Hospital Setting: Feasibility and Benefits

Presenter: Olivia Pellarin
Faculty supporters: Dr. Colleen Renihan, Dr. Julia Brook, DAN School of Drama and Music, Queen's University

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Background: The SWAY program was a pilot project designed to explore the benefits and feasibility of implementing an art-based program in a hospital setting to support selfhood and well-being among older adults. Due to the rapid aging population in Canada, it is crucial to identify effective approaches to support the well-being of older adults. Research in Community Arts consistently highlights the positive outcomes of singing and movement-based programs for older adults. Specifically, singing and dancing have been used to counter symptoms of mental illness. In this study, we explored both the benefits of an arts-based program for hospital patients and the challenges associated with implementing such programs in a clinical environment.

Methods: The SWAY program took place over seven weeks in the Worship Centre at Providence Care Hospital, with patients attending one session per week. Each session was 45-minutes, including a 5-minute vocal warm-up led by a vocalist, a 5-minute physical warm-up led by a physiotherapist, and 35-minutes of singing and movement using props. Patients completed check-in and check-out cards before and after each session, ranking their emotional state, physical well-being, social connectedness, and vocal condition on a 5-point scale (1 = poor, 5 = optimal). Recordings of each session were used to collect observational data.

Findings: The average scores for the check-in and check-out cards increased from pre- to post SWAY session, demonstrating improvements in all four well-being parameters. Observational data identified increased playfulness and enhanced social connectedness among patients. Key challenges for integrating an art-based program in a hospital setting include scheduling conflicts with existing patient

appointments and assistance with transportation to and from the sessions. These findings support arts-based interventions as a meaningful complement to clinical care. Feasibility challenges can be reduced by delivering sessions directly on patient floors and coordinating program timing with clinical teams.

Environmental Impact of Residual Hydroxamic Acid Collectors in Niobium Flotation Tailings

Presenter: Kira Van Doorn
Faculty supporter: Dr. Charlotte Gibson, Department of Mining Engineering, Queen's University

The goal of this research is to determine the environmental impact of benzohydroxamic acid (BHA) in tailings when used as a collector in niobium flotation.
Flotation is the primary method used for the beneficiation of transition metals, like niobium, and rare earth elements (REEs), relying on collectors to selectively bind to the mineral of interest. Hydroxamic acids employ a chelating mechanism for the selective binding to multivalent transition metals and REEs. However, this mechanism is not highly specific, so the primary research objective is to see if the residual BHA in the tailings and process water causes significant leaching of any elements. Additional objectives are to determine if the BHA in the tailings concentrates and increases the mobility of elements known to have negative impacts on human, animal and ecosystem health, and what BHA concentrations need to be for this to occur. Multi-element leachate chemistry is monitored over time using inductively coupled plasma mass spectrometry (ICP-MS). BHA degradation is monitored with ultraviolet-visible spectroscopy. To model industry conditions, tailings are produced and dewatered to 70-75% solids. After a leachate sample is removed, stored process water is added to maintain the same % solids. Preliminary research results show enrichment of transition metals in the leachates, though more work needs to be done to confirm any impact.

The Mental Health Impact of Online Gender-Based Sexual Violence on Adolescent Girls: A Systematic Review

Presenter: Zara Zafar

The rise of digital technologies has coincided with increased technology-facilitated gender-based sexual violence (TF-GBSV), including online sexual harassment, sextortion, and non-consensual image sharing. Adolescents (especially girls and gender-diverse youth) are disproportionately affected, with exposure linked to depression, anxiety, low self-esteem, and other adverse mental health outcomes. This systematic review examined associations between F-GBSV and mental health among adolescent girls, including cisgender, transgender, and sexual minority youth. Following PRISMA guidelines, five databases were searched through June 2025. Eligible studies included adolescents aged 14-18 years exposed to TF-GBSV with reported mental health outcomes. Data was extracted and assessed using the Joanna Briggs Institute and COSMIN tools. Fifteen studies (12 cross-sectional, 2 longitudinal, 1 qualitative) representing 11 countries met the inclusion criteria. Online sexual harassment (87%) and non-consensual image sharing (80%) were the most studied forms, with nearly half reporting

polyvictimization. TF-GBSV exposure was consistently linked to poorer mental health, including depression (73%), anxiety (67%), psychological distress (40%), as well as lower self-esteem, suicidality, and substance use. Polyvictimization predicted the most severe outcomes, and gender-diverse/LGBTQ+ adolescents experienced greater psychological harm than cisgender peers. Qualitative findings emphasized fear, shame, institutional neglect, and heightened distress. Overall, TF-GBSV represents a significant risk to adolescent mental health, particularly for marginalized gender and sexual identities. These results underscore the need for trauma-informed prevention, inclusive policies, and tailored mental health support. Longitudinal and culturally diverse research is needed to clarify long-term effects and guide interventions.

Continuous Glucose Monitoring Trends Among Ethnically Diverse People with Type 2 Diabetes

Presenter: Katherine Zhu

Background: Ethnic background and social determinants of health influence glycemic management and type 2 diabetes (T2D) outcomes, with inequities in risk and complications across diverse populations, even at similar body mass index. Hemoglobin A1c, the standard glycemic biomarker, may perform differently across ethnic groups and does not fully capture glucose variability, highlighting the need for alternative metrics. Intermittently scanned continuous glucose monitoring (CGM) offers a more granular assessment, but ethnic differences in CGM-derived glycemic patterns remain insufficiently characterized.

Objective: To determine how self-monitored glucose profiles vary according to ethnicity among adults with T2D using CGM at Toronto General Hospital, University Health Network.

Methods: This single-centre observational study included adults (≥18 years) with T2D using a Freestyle Libre CGM and at least 2 consecutive weeks of usable sensor data, excluding individuals receiving high-dose oral or intravenous corticosteroids during the observation window or with insufficient CGM wear time. Ethnicity groupings were adapted from Statistics Canada and consolidated into six categories; when self-reported ethnicity was missing, non-English language was used as a proxy. Linear mixed models with random effects and splines will evaluate interactions between ethnicity and diurnal glucose patterns, adjusting for demographics, device type, and medications, using time in range, hypoglycemia, hyperglycemia, and postprandial changes as outcomes.

Results: The final cohort includes 111 individuals: East Asian (n=20), South Asian (n=16), Southeast Asian (n=14), Middle Eastern and North African (n=16), White (n=30), and Other (n=15). Preliminary findings suggest higher CGM time in range among South Asian, East Asian, and Other participants, potentially implicating underlying differences in insulin sensitivity and socioeconomic context.

Conclusion: Ethnicity may influence CGM-derived glucose patterns among people with T2D. Characterizing these differences may inform more equitable, culturally sensitive diabetes care and guide interpretation of CGM metrics across diverse populations.

Keynote Lecture

Thursday, March 12, 1:00-2:30 PM

The 1966 Reading Room, Douglas Library

Moderator: Shelley Woods, Education Librarian

The Power of Storytelling Research: Connecting Across Diversity

Presenter: Dr. Patty Douglas, Faculty of Education, Queen's University

In this talk I will share about the storytelling research I do with diverse autistic and neurodivergent communities in Canada, England and Aotearoa New Zealand. Research can sometimes feel like a distant or unconnected activity controlled by universities and unconnected to everyday lives and the things that matter most to communities. Storytelling research invites participant-storytellers to take ownership of the research process through making and sharing multimedia stories (videos, zines, art) about the issues of importance to their lives and communities. Participant-storytellers own their stories and often choose to participate with the research team to help share their stories with decision makers and professionals who are in a position to improve teaching, learning and other conditions for thriving. This matters because storytelling research has the power to change worlds and connect communities in ways that create kinder and more equitable worlds. You can see more about the storytelling projects I do here: www.restoryingautism.com

Patty Douglas is Associate Professor, Inaugural Chair of Student Success and Wellness and Director of the Centre for Community Engagement and Social Change in the Faculty of Education at Queen's University. Her work focuses on cultivating access and disability justice in research, practice, and policy through critical arts-based, disability studies, decolonial, storytelling and other critical and creative approaches. Among others, Patty founded and currently leads the Re•Storying Autism project (www.restoryingautism.com), a longitudinal multimedia storytelling project transforming educational practice in Canada, New Zealand, and the UK. Patty brings dynamic experience to her roles as a former special education teacher, neurodivergent individual, and mom of two neurodivergent sons, one of whom attracted the label of autism Her book, *Unmothering Autism*, is available from UBC Press. For more information see https://educ.queensu.ca/people/patty-douglas

Session C: Engineering

Thursday, March 6, 2:45-4:00 PM

The 1966 Reading Room, Douglas Library

Moderator: Alicia Cappello, Research & Instruction Librarian - Engineering & Science

Tinynav: Real-Time Navigation Using Neural Networks on Microcontrollers

Presenter: Pooria Roy

Achieving real-time, autonomous obstacle avoidance and path planning on low-cost robotics platforms, such as those based on microcontrollers like Arduino, is a significant challenge due to strict computational and memory constraints. Existing approaches often rely on manual control, predefined algorithms, or more powerful processors like single-board computers, which limits accessibility and scalability. This project addresses this gap by leveraging recent advances in microcontroller hardware and TinyML frameworks to enable on-device neural network inference for autonomous navigation.

We evaluate the feasibility of deploying a lightweight Convolutional Neural Network (CNN) augmented with temporal context on a low-resource microcontroller using Time-of-Flight (ToF) sensor data. Data are collected in a controlled circuit composed of simple walls and box-shaped obstacles, with the robot manually driven to capture several hours of sensor readings, reducing variability and ensuring reliable generalization. The architecture combines a 2D CNN for spatial feature extraction with a Long Short-Term Memory (LSTM) layer to capture temporal dependencies across sequential frames. CNN features are extracted from consecutive frames using a TimeDistributed approach, after which the LSTM predicts steering and acceleration commands. Model compression techniques, including pruning and quantization, are applied to meet flash memory and real-time inference constraints.

Our results demonstrate that running neural networks for autonomous navigation on low-cost microcontrollers is practical, even under limited computational resources. This highlights the potential of TinyML to enable intelligent behavior on affordable, low-power devices. By showing that meaningful autonomy can be achieved without high-end hardware, this work expands the applicability of TinyML in real-world robotic systems and opens the door to more accessible and adaptive low-cost robotics solutions.

Experimental Investigation of Rotor Sail Power Requirements

Presenter: Andrew Phillips
Faculty supporter: Dr. John Kurelek, Department of Mechanical and Materials Engineering, Queen's University

In accordance with global climate policies, the International Maritime Organization (IMO) has introduced strict regulations to reduce greenhouse gas (GHG) emissions in the maritime shipping industry. This has created significant impetus to pursue new technologies to meet these regulations, all the while continuing to satisfy the increasing demand of international shipping. Rotor sails are a simple and fuel-efficient supplement to conventional propulsion methods that can be retrofitted onto existing ships. These devices, consisting of a vertical rotating cylinder, generate thrust from the wind through the Magnus effect and can provide fuel savings of up to 25%. However, there is currently no reliable method to accurately predict rotor sail power requirements, leaving engineers unable to incorporate these devices into designs without introducing significant risk and/or uncertainty. The development of a reliable and standardized method to determine power requirements for rotor sails is needed. The required power depends on the rotational speed and the torque acting on the rotor's surface to overcome frictional forces. In this project, the power required to operate a rotor is characterized through a series of experiments in water and air, as well as at various rotational speeds. For this purpose, an existing scaled - down rotor sail model, equipped with a servo motor capable of 8000 RPM and 3.4 Nm was used. A mounting system was designed to support the rotor in a large fluid tank. The output RPM and torque data was collected during operation to determine the operating power of the rotor in each test. To examine the effects of fluid properties on the required torque, the temperature and pressure values were collected during each test. Through these experiments, a refined method is proposed in order to effectively predict power requirements for any rotor sail.

The Balloon-borne Very Long Baseline Interferometry EXperiement (BVEX)

Presenter: Aarchi Shah
Faculty supporter: Dr. Laura Fissel, Department of Physics, Queen's University

The Balloon-borne VLBI EXperiment (BVEX) is aimed at proving that a radio telescope mounted on a high-altitude helium balloon can be partnered with ground-based radio dishes to create an Earth-spanning radio telescope.

BVEX uses VLBI (Very Long Baseline Interferometry), a powerful technique used in radio astronomy where many telescopes in different locations on Earth observe the same astrophysical object simultaneously. The data is later correlated to produce high-resolution images. High frequency VLBI has already enabled transformative science. For example, it was implemented by the Event Horizon Telescope in imaging the shadows of the supermassive black hole at the center of our galaxy.

However, a major limitation of ground-based VLBI is the atmospheric absorption of high frequency radio waves. BVEX addresses this challenge by serving as an additional VBLI station nested in the stratosphere, operating above 99% of Earth's atmosphere. This enables observations at frequencies that are largely inaccessible from the ground and improves the quality of high-resolution radio images.

BVEX was launched on Friday, August 29th; however, the flight was terminated prematurely due to a severe leak in the balloon. Despite this outcome, the flight provided valuable engineering and operational insights for BVEX 2.0: an improved version of BVEX that is currently in development and will be launched in 2027!

Design of a Beam Profile Monitor for Measurement of Direct Current Particle Beams at the Reactor Materials Testing Laboratory

Presenter: Graeme Cook
Faculty supporter: Dr. Mark Daymond, Department of Mechanical and Materials Engineering, Queen's University

Queen's University's Reactor Materials Testing Laboratory operates a direct current linear particle accelerator to conduct irradiation experiments for the research of nuclear materials. The accelerator is currently capable of accelerating hydrogen and helium nuclei (protons and α–particles, respectively) to a maximum energy of 8 MeV at a maximum current of 40 μA. To ensure the delivery of consistent and high-uniformity ion beams, beam profile monitors are needed.

The Scanning Wire Ion Profile Reconstructor is a design for a beam profile monitor that can independently measure and output the ion beam's intensity in two spatial dimensions in an accessible and useful format. To achieve these goals, the instrument makes use of a mechanical subsystem, an electrical subsystem, LabVIEW control software, and Python computerized tomography software.

The design of the instrument revolves around conducting wires that are held in electrical isolation within the accelerator beamline. The positively charged accelerated particles impart their charge directly onto the wires as an electrical current as they are actuated in and out of the ion beam. This current is directly proportional to the beam current, and is conditioned with operational amplifiers for digital acquisition before post-processing. Once a measurement is made, it is processed to a graphical output for easy use by the accelerator operator in aligning and adjusting the beam.

A prototype of the instrument has been tested in the beam at various conditions on three separate occasions. Results indicate that the instrument performs as theoretically predicted, and comprise measurements of the beam profile, depicting its intensity and position in space. Improvements are continually being made to all aspects of the instrument by iteration, informed by information gathered through ongoing testing. Semi-permanent installation of the instrument alongside other beam profile monitors is underway as part of a broader effort to improve the laboratory's diagnostic equipment.

Finding Nemo, on a Budget: Improving Cost-effective Methods for Geolocation of a Radio-Frequency Emitter

Presenter: Ava Kelly
Faculty supporter: Dr. Ruben Perez, Department of Mechanical and Aerospace Engineering, Royal Military College

In search and rescue applications, traditional methods to geolocate a remote area radio-frequency signal rely on portable antennas to detect its location. The methods to detect the emitter either employ a single expensive antenna, but this is slow. A faster method is to use multiple cheaper antennas, typically mounted on moving vehicles. This method is costly, and requires both moving bodies and their antennas are always operational. The key question is, can we make an alternative method to locate an emitter using just one moving antenna.
I have investigated methods to geolocate a stationary emitter using only one receiving antenna paired with a GPS. Data was collected from a vehicle equipped with a software defined radio as the cheap antenna and a GPS while tracking the CBC Radio One broadcast station.
Two methods of data processing were explored to get two estimates of emitter location. A least squares optimization algorithm was used on the received signal strength data. This method was able to detect the emitter to within 5 km of the true value on average. The next algorithm employs measuring the time difference of arrival of the signal by treating the antenna at different positions as two antennas.
Low-cost search and rescue tools like this have the potential to support volunteer search and rescue groups, or support communities in remote areas without access to high technology equipment.

Detecting Supernovas with SuperCDMS

Presenter: Lily Hines

Core-collapse supernovae emit the vast majority of their energy in the form of neutrinos, providing a unique probe of the explosion mechanism and the stellar core. Because supernovas are so rare, we need as many detectors as possible ready to detect these supernova neutrinos. Coherent elastic neutrino–nucleus scattering (CEvNS) offers a flavor-independent detection channel, but its low recoil energies require detectors with exceptionally low thresholds. This motivates an investigation into whether cryogenic dark matter experiments could also serve as supernova neutrino detectors.

In this project, I examine the sensitivity of the SuperCDMS experiment to neutrinos from a Galactic core-collapse supernova. Using neutrino fluence models informed by SN 1987A observations and contemporary supernova simulations, I calculate CEvNS cross sections and differential nuclear recoil spectra for germanium and silicon detector materials. These spectra are evaluated relative to SuperCDMS energy thresholds to estimate observable event rates as a function of supernova distance. The analysis also considers the effect of detector material choice and explores solar neutrinos as a potential background.

The results indicate that SuperCDMS could detect multiple neutrino-induced nuclear recoils from a supernova within several kiloparsecs. This demonstrates that cryogenic dark matter detectors may

provide meaningful sensitivity to low-energy supernova neutrinos. More broadly, the work highlights the potential for existing dark matter experiments to contribute to multi-messenger supernova astronomy without dedicated neutrino-specific instrumentation.

Session D: Science II

Friday, March 13, 9:05-10:15 AM

The 1966 Reading Room, Douglas Library

Moderator: Courtney Svab, Health Sciences Librarian

Development of a Wireless Strap Tension Measurement System for Unloader Knee Braces

Presenter: Jialin Luo
Faculty Supporter: Dr. Qingguo Li, Department of Mechanical and Materials Engineering, Queen's University

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Knee osteoarthritis (OA) is a prevalent degenerative joint disorder that affects approximately 25% of the elderly population. While unloader knee braces can reduce medial compartment loading through a three-point bending mechanism, their efficacy relies on tensioning the strap precisely to apply the correct amount of pressure during use. Excess pressure above 5.33 kPa can lead to skin irritation, tissue damage, and impaired blood flow, while insufficient pressure diminishes therapeutic benefit and leads to brace migration. In home settings, patients struggle to replicate prescribed tightness in the knee brace, and 25% of patients discontinue brace use due to discomfort caused by excessive pressure. Direct pressure measurement often uses force-sensing resistors (FSRs), but they are unreliable due to sensor noise and surface dependency.

We present the development and preliminary validation of a wireless strap tension measurement system for real-time knee brace monitoring in home environments. Our system establishes measuring tension as a reliable surrogate for pressure by validating their quantitative relationship. Instead of using inaccessible laboratory tensiometers to measure strap force, we use portable strain gauge-based strap-force sensors (SFSs) integrated with a wireless data acquisition module.

The calibrated SFSs demonstrated 98.23 ± 0.26% accuracy. Validation testing on curved surfaces and mannequin-fitted knee braces simultaneously measured strap tension (4.5–152.7 N) and interface pressure (3.1–8.5 kPa), revealing strong positive correlations with location-dependent proportionality constants. The established tension-pressure relationships from this study enable knee brace users to independently maintain therapeutic pressure levels at home and establish a foundation for "smart" braces with automated tension control. Future clinical trials could use this system to evaluate the impact of optimized knee brace strap tension on OA rehabilitation outcomes.

3D Printing & Accessibility: A Low-Cost, Adaptive Tool for Creating Meaningful Change in the Chemistry Lab Space

Presenter: Chloe Graham
Faculty Supporter: Dr. Richard Oleschuk, Department of Chemistry, Queen's University

The discipline of chemistry has long faced the challenge of incorporating full accessibility to individuals with disabilities in the laboratory space. Critical health and safety requirements coupled with the non-inclusive tools available render the lab a highly exclusionary environment. Despite ongoing conversations around equity and inclusion, laboratory environments remain some of the most exclusionary in academia – particularly for individuals with physical disabilities. Some chemists may believe that there is nothing to be done, as many lab tools have been in use for decades with little modification, and have worked well for the predominately nondisabled chemistry community during that time. However, disabled people are not hypothetical – we are your students, colleagues, and collaborators. We are present even when invisible to the eye, and we belong here. This work addresses enhancing lab accessibility for persons with tremors and similar physical disabilities. Drawing from lived experience and inclusive design principles, we introduce a series of low-cost 3D printed tools designed by and for people with tremors to improve the accessibility of routine laboratory tasks. We advocate for the necessary evolution of the laboratory to reflect the full spectrum of those who both shape and sustain the chemical sciences.

Estimating Lake Bathymetry to Investigate Wildfire Impacts on Fish Habitat in Lac La Martre

Presenter: Kate Vanderlaan
Faculty Supporter: Dr. Jason Olsthoorn, Department of Civil Engineering, Queen's University

This study investigates the effects of wildfires on lake water quality and their implications for fish habitat in Whati, a remote Indigenous community situated on Lac La Martre in the Northwest Territories. The community experienced a major wildfire in 2014, with wildfire activity continuing in subsequent years. Community members have observed changes in fishing patterns, reporting that fish are no longer found where they were historically abundant, and speculate that these shifts may be linked to wildfire-driven changes in lake conditions. To examine these relationships, the Aquatic Ecosystem Model 3D (AEM3D) is used to simulate lake flow, temperature, and water quality processes. However, AEM3D requires gridded bathymetry input to accurately represent lake structure and dynamics, with bathymetry defined as the measurement of lakebed topography. Developing this input posed a significant challenge due to the lake's remote location and the loss of detailed data from the only prior bathymetric survey conducted in 1969, for which only a low-resolution depth figure remains. To address this limitation, a MATLAB-based bathymetry estimation model was developed using limited historical depth information, applying near-neighbour interpolation and Gaussian smoothing to estimate full-lake bathymetry while incorporating islands and complex shoreline features through

geospatial coordinates. Fieldwork further refined the model by including targeted depth data collected by a small boat and leveraging community members' knowledge of shoals, drop-offs, and observed changes in the lake. The resulting bathymetric model provides the foundation for AEM3D simulations to explore connections between wildfires, lake conditions, and fish habitat, and offers a transferable approach for studying other remote lakes with limited bathymetric data.

Voices of Indigenous Youth: Economic Aspirations in the Transition Beyond Diamond Mining

Presenter: Sofia Igel
Faculty Supporter: Dr. Rebecca Hall, Department of Global Development Studies, Queen's University

Indigenous youth in mining regions of the Northwest Territories (NWT) have often been excluded from discussions about their futures, despite bearing the impacts of an extractive political economy. Decades of intense mining have resulted in environmental degradation and systemic devaluation of Indigenous livelihoods, perpetuating settler colonial dispossession. As the NWT's diamond mines begin closing, this research documents how relationships to land shape aspirations for economic opportunities amongst Indigenous youth, and how land-based aspirations can be actualized through employment.

In partnership with the Tłı̨chǫ Government, my work is part of the SSHRC-funded project, Futures of Care (PI: Rebecca Hall). Using a youth-centred approach, I analyzed 72 interviews and workshops with Indigenous youth. These interviews were coded to thematically examine lived experiences, aspirations, and hopes for economic opportunities. Initial themes were compiled into a community report for local partners, supporting the integration of youth into policy and programming. Drawing on Indigenous theory and political ecology, a regional job market analysis contextualized youth perspectives, informing how structural labour trends align or conflict with youth aspirations.

In the interviews, youth articulated hopes for futures beyond extraction, describing mining's effects on community networks and well-being. Participants emphasized the need for jobs aligned with cultural values and relationships to land, highlighting the importance of educational diversification and localized economies of mutual benefit. While new employment opportunities are projected, their scale raises concern regarding alignment with losses linked to mine closure, particularly in smaller communities. The dominance of extractive industries has impacted educational and economic pathways, likely limiting access to emerging employment. Mine closure presents opportunities for income diversification amongst youth but coincides with limitations, shaped by regional socio-political dynamics and colonial regimes. This project offers insight for communities advocating for just and resilient transitions amid mine closure, prioritizing the needs of Indigenous youth and access to relevant work opportunities.

Effects of warming and enhanced snow deposition on soil moisture and soil temperature in High Arctic ecosystems

Presenter: Rory Wilkins
Faculty supporter: Dr. Neal Scott, Department of Geography and Planning, Queen's University

"Warming has an especially significant effect on High Arctic soils because these systems are carbon-rich and are closely linked with permafrost processes. Fluctuations in soil temperature and moisture in the High Arctic influence rates of permafrost thaw and microbial activity, leading to increased soil carbon release and loss of critical nutrients.

This project aims to understand the effects of atmospheric warming by examining how elevated temperature and snow deposition influenced soil moisture and soil temperature trends from 2015 to 2024 in soils at the International Tundra Experiment (ITEX) site on Melville Island, Nunavut at the Cape Bounty Arctic Watershed Observatory (CBAWO). ITEX is a long-term, global experiment, investigating the effects of climate warming on tundra ecosystems through standardized experimental warming methods, such as open-top chambers. At the CBAWO, snow fences allow us to examine the interactive effects of elevated temperature and snowfall. Hourly soil measurements were collected from three of eight replicates under four treatments: Control, Warm, Snow, and Snow + Warm combination. Measurements included volumetric water content (m^3/m^3 VWC) and temperature at 5cm depth (°C), and temperature at thaw depth (~60 cm below the soil surface).

Spring months showed the greatest change in temperature and moisture across all years and between all treatments. A significant interaction between years and treatments when observing the effects on temperature ($F(3,291039) = 12.92$, $P < 0.0001$) indicates that the effect of each treatment varied annually, suggesting legacy effects on soil warming. Across all years, Control plots were consistently the coldest, while the combined Snow + Warm treatment produced the greatest warming, demonstrating synergistic effects.

Mitigating the Effects of Human Activities on the Endangerment of Large Vertebrate Species in East Africa

Presenter: Alicia Hartlieb

Introduction: Human activities can have many detrimental effects on large vertebrate species of East Africa, many of which are facing endangerment. As the human population continues to grow, this begs the question of how the effects of human activities can be mitigated for the purpose of wildlife conservation, as well as the drawbacks that should be considered in the implementation of various conservation practices.

Methods: This paper reviews the major human activities that contribute to the endangerment of large vertebrate species in East Africa. Further, it addresses the primary conservation practices that are currently being implemented or considered to be implemented in the future. In providing a critical

review of the evidence for the success of each practice, this paper puts forth suggestions for their optimal application.

Findings: The primary human activities that contribute to large species' endangerment are human land use, human-wildlife conflict, utilization of animals, depletion of prey, and climate change, which is exacerbated by the growing human population. The most common strategies to mitigate the effects of human activities are the designation of protected areas, optimization of land use, government intervention, efforts combatting global warming, and translocation of endangered species. However, each of the strategies are not without drawbacks, such as suboptimal establishment and implementation such as protected land not being in vertebrate hotspot areas, alienation of local communities through militarized conservation efforts, cost to local communities, diminished economic growth, and translocation practices being uninformed by genetic information.

Session E: Arts & Humanities I

Friday, March 13, 10:30-11:30 AM

The 1966 Reading Room, Douglas Library

Moderator: Nicole Kapphahn, Teaching & Outreach Archivist/Librarian

Funding or Freedom?… Censorship within Canadian Archives and Acquisitions

Presenters: Gursharan Gill, Alyssa Gauthier

This paper examines how private funding structures shape the autonomy of cultural institutions. Through comparison of Canadian community-based archives and large institutions, the confines imposed on curators by funding conditions are negotiated alongside the freedoms of organizations that operate without the influence of external stakeholders.

Through the compilation of case studies this paper brings Canadian cultural institutions into the greater conversation of cultural censorship. The Sikh National Archives and the Black Memory Collective are two examples of Canadian community archives that function off volunteer initiative alone. Their lack of funding poses both a strength to their ability to craft collections that speak to their represented communities but a weakness to their long-term continuity. However, it is made clear when examining larger Canadian institutions, receiving private funding presents issues of its own. Past and present examples of censorship, such as recent acquisition rejections at the Art Gallery of Ontario, reveals the power private funders and institutional stakeholders hold in determining which narratives, artists, and histories are deemed acceptable for acquisition.

This exposes the structural tension between the need for funding and the ideal of freedom cultural institutions face. Ultimately this raises pressing questions; What are the implications of private funding? How can smaller institutions reap the benefits of funding without handing over their power, and how can larger institutions negotiate with their stakeholders cultural control? Is true balance between private funding and autonomy possible?

From Hashtag to Power: How #MeToo Reshaped Political Accountability

Presenter: Jade Dodds

The #MeToo movement emerged as a viral social media campaign in 2017 but quickly became one of the most politically consequential feminist movements in recent U.S. history. By exposing patterns of sexual misconduct among powerful figures in politics, media, and business, the movement produced high-profile resignations, electoral consequences, and new legal reforms. At the same time, its influence was uneven and often constrained by political polarization, institutional resistance, and persistent inequalities. This project examines how #MeToo translated digital activism into political

accountability in the United States and why that influence faced significant limits at the institutional level.

Drawing on resource mobilization theory and political opportunity structure theory, this research analyzes how social media, celebrity advocacy, investigative journalism, and survivor networks provided the movement with cultural, legal, and political resources. Using academic literature, media reporting, and policy analysis, it traces how these resources enabled #MeToo to pressure institutions into action, including the resignations of elected officials and the passage of workplace harassment reforms. The project also examines how partisan divisions, media framing, and existing power structures restricted accountability in cases such as the 2018 Supreme Court confirmation hearings.

The findings suggest that #MeToo succeeded when favorable political conditions, public support, and media attention aligned, but that these openings were fragile and unevenly distributed. While the movement achieved important legislative and cultural change, particularly in workplace protections and public attitudes toward survivors, it also reproduced inequalities in whose voices were heard and whose cases led to consequences. This study highlights how digital feminist movements can generate real political impact while remaining constrained by the institutions they seek to transform.

"Tell us a story, [white] mother!": The Mahāvamsa and Historical Truth in Lanka

Presenter: Thinugi Wickramasinghe
Faculty Supporter: Dr. Ishita Pande, Department of History, Queen's University

The Mahāvamsa (Great Chronicle) is a court chronicle first composed in the 6th century BCE by the monk Mahānāma, and meticulously updated to record the history of the Sinhala Buddhists of Lanka – modern-day Sri Lanka – between 542 BCE and 1782 CE. Until the Mahāvamsa was first translated from its original Pāli into English by George Turnour in 1836, the mere existence of the document was known to only a few members of the Buddhist sangha (clergy). Yet, since its rediscovery and subsequent promotion by the British as the island's only authentic history, it has come to dominate the island's politics, culminating in the emergence of the Sinhala Buddhist nationalism upon which the modern Sri Lankan state was founded. According to the Mahāvamsa — and no other Buddhist text — the Buddha proclaimed with his dying breath that the dhamma (his teachings) would live on in Lanka, and Sinhala Buddhist nationalists took this as their marching orders to destroy any threat to Buddhist hegemony, even through the use of violence, which the Buddha famously condemned. Sinhala Buddhist nationalism's reconciliation of the Buddha's philosophy of pacifism with violence is the focal point of my research. In an attempt to unravel this paradox, my paper will delve into the processes by which the Mahāvamsa came to shape Sinhala Buddhist nationalist ideology by examining its point of genesis: the colonial classroom. Through an examination of children's storybooks and history textbooks produced during the late 19th century, I will investigate the role of the colonial-era school system in shaping the historical memory of Lanka's past, exploring the relationship between colonialism, pedagogy, and collective nostalgia.

Telling Stories in Historical Interpretation and Site-Specific Theatre

Presenter: Emily Mealing

Visit any living history museum, and you'll find yourself surrounded by costumed historical interpreters. By demonstrating the appearance of life in the past, these interpreters perform history. While not always considered a form of theatre, first-person historical interpretation contains some of its key hallmarks: liveness, mimesis and storytelling. Specific moments – such as demonstrations and shifts in body language or terminology – can be classified as "twice-behaved behaviours," an integral process of performance, according to Richard Schechner. By embodying historical figures, interpreters essentially become actors. This research engages with such scholars as Schechner, Alan Filewood and Freddie Rokem. Additionally, I draw on my own experiences as a historical interpreter to look at the ways in which first-person historical interpretation not only falls under the definition of theatre, but also is a unique and successful storytelling tool due to this theatricality.

Blood Libel, Hippies, and the Nuclear Family; McMartin Preschool and the Satanic Panic of the 1970s-80s

Presenter: Abagail Mcintyre-Tsiang

Through the late 1970s and early 1980s, frenzied accusations of ritual satanic abuse swept daycares worldwide (Hughes 2016). McMartin Preschool received the most coverage and created national hysteria, which led to the longest and most expensive criminal trial in American history, started by a single accusation of abuse from a schizophrenic mother (Hughes 2016). Focusing on the McMartin case, my paper examines how this unfounded panic spiralled so severely that the US government spent 7 years and 15 million dollars to figure out if daycare workers should serve time for unfounded, unimaginable, and sometimes literally impossible atrocities (Linder).

In this paper, I examine transcripts of interrogations of children involved in the case; police letters to parents; research on the nuclear family, historical, and present satanic panics; and the political and cultural climates that allow paranoia to foster. I argue that paranoia of hippy leftism and a dissolving of the nuclear family structure in the late 1970s and early 1980s fostered cultural anxieties about anti-capitalism and anti-Christianity that made fertile soil for the satanic panic to grow. What started as one claim from a mentally ill mother gained momentum against a backdrop of cultural anxiety and was exacerbated by police and social worker incompetence as well as predatory tabloid media and televangelists. Finally, I draw on a pattern of centuries of paranoia about Satanism attached to moments of cultural change and anxiety to explain how the satanic panic of the 1970s and 80s is another point on the timeline of cultural moral panics, followed closely by the satanic panic of our time, QAnon.

Bibliography

Hughes, Sarah. 2016. "American Monsters: Tabloid Media and the Satanic Panic, 1970–2000." Journal of American Studies 51 (3): 691–719. https://doi.org/10.1017/s0021875816001298.

Linder, Douglas. "The McMartin Preschool Abuse Trial: An Account." Famous-Trials.com. https://famous-trials.com/mcmartin/902-home.

Session F: Arts & Humanities II

Friday, March 13, 11:45 AM-12:45 PM

The 1966 Reading Room, Douglas Library

Moderator: Jesse Baker, Research, Instruction & Online Learning Librarian

There's No Place Like "Home": Identity, Belonging, and Challenging the Label of German Maximalism in Gustav Mahler's Symphonies

Presenter: Lauren Williams
Faculty supporter: Dr. Stephanie Lind, DAN School of Drama and Music, Queen's University

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"Who is Gustav Mahler? Mahler was a composer from the late 19th century to the early 20th century. His style blends past music traditions into future music ideologies. Born into circumstances that impacted how he was perceived by the German public, Mahler's symphonies combine heavy emotion with musical representations of his personal life and experiences, a style sometimes described as "German Maximalism".

Beginning with the fall of the Second French Empire after the capturing of Napoleon III in 1870, the Franco-Prussian War (1870-1871), and the overall reconstruction of leverage with European countries, Gustav Mahler found himself inadvertently and advertently suffering the effects of this aftermath. Born into a Jewish family in Bohemia during the reign of the Austro-Hungarian Empire, Mahler grew up surrounded by tensions. Despite Mahler's growing success as a composer, he frequently faced daily challenges of marginalization that drove him to abandon his own faith and convert to Catholicism to accept the appointment at the Vienna Court Opera.

Through the lens of German-Jewish world history of the late nineteenth and early twentieth centuries, this paper challenges the label "German Maximalism" frequently given to Mahler. In lieu of categorizing Mahler as a continuation of the longstanding German symphonic tradition bounded by characteristics of excess, power, and totality, this paper instead examines the musicological implications of antisemitism, nationalism, corrupted politics, and questions of belonging in his era. This presentation will demonstrate not only how Mahler resists the aesthetic of this label, but also how outside social, cultural and political factors that occurred had direct impacts on the music he created in his lifetime. This will allow a readjusted perspective when looking at Mahler's Ninth and Sixth Symphony as they reflect upon a world of tragedy, isolation, and judgement.

Saul's Steed: A Sentient Being in Baroque Art

Presenter: Samantha Waddell
Faculty supporter: Dr. Gauvin Bailey, Department of Art History, Queen's University

Despite the lack of a steed in the biblical account of Saul's conversion, the Baroque artists Girolamo Francesco Maria Mazzola, Michelangelo Merisi da Caravaggio, Peter Paul Rubens, and Mattia Preti used the horse as a visual anchor to portray the biblical story. The addition of a mount, paired with Saul's body, on the road to Damascus dramatizes his tumble, providing significance for his fall to the ground. These artists perceived the horse as a necessary vehicle to illustrate the importance of Saul's awakening to Christianity.

Christ's desire to convert and teach Saul results in the defiant attitude of Saul's steed, revealing his inner instability. Saul's dismounted figure and his frenzied equid depict the severance between Saul and his former identity as a persecutor. The use of chiaroscuro imitates Saul's temporary blindness, having succumbed to the blinding light of Christ. As a compositional tool, the immediacy of Saul's horse creates an upward trajectory bound by a vertical plane typical of mannerism, aligning his mount with the heavens above. The charger sports a leopard print saddle that symbolizes the persecution of Christianity, warning them of their fate. The saddle reveals the desire to control wild animals, indicating that Christians were considered beings that needed to be tamed.

The dynamism of the horse's reactions to Christ's appearance emphasizes that Saul's steed was considered a conscious, knowledgeable being. Saul's biblical transition to Christianity was experienced by both himself and his horse, whose presence as a sentient being magnifies the visual impact of Saul's conversion. The horse's contextualized awareness of the scene signals the power of the charger within biblical imagery, emphasizing the importance of studying animal behavior within spiritual scenes. Art historians should consider how the equid is employed as a visual extension of Saul's contemplation during his transition into Christianity.

Georgia O'Keeffe - A Sapphic Symbol?

Presenter: Alyssa Gauthier
Faculty Supporter: Dr. Jennifer Kennedy, Department of Art History, Queen's University

This project examines the contemporary adoption of Modernist artist Georgia O'Keeffe's floral paintings as sapphic symbols within queer visual culture, despite the artist's repeated rejection of sexual and feminist interpretations of her work. Presented as a roundtable podcast with queer-identifying voices, this project explores the intersection of feminist and queer theory. It uses psychoanalysis and semiotics to further investigate why her work is so frequently categorized as a representation of sexuality and womanhood.

The podcast traces how original interpretive frameworks continue to shape contemporary readings of O'Keeffe's work, while also arguing that queer spectatorship operates under fundamentally different

power dynamics. By drawing on debates surrounding intention and interpretation, the project asks whether O'Keeffe's work can be meaningfully claimed by queer audiences without reproducing the same misinterpretations imposed by earlier, male critics. A second line of inquiry examines the projection of gender binaries onto flowers themselves, discussing scholarship that emphasizes the hermaphroditic nature of floral biology by comparing O'Keeffe's paintings to Robert Mapplethorpe's floral photographs.

The project concludes by situating O'Keeffe's floral imagery within the practice of queer coding and proposes that her works now function as a form of sapphic visual language. While unintended, the ethics of this queer appropriation are explored as evidence of the evolving relationship between Modernist art, Feminism, and queer meaning-making today.

Contemporary Influences in the Acallam na Senórach

Presenter: Alexander Baillie

I aim to highlight a variety of intentional contemporary ideas embedded in the Acallam na Senórach, a 12th-13th century text and for what reason these appear. The Acallam na Senórach is a 12th-13th century text likely created by a reformed member of the Irish clergy and sponsored by the reformed elite of Connaught. The text focuses on the journey of Saint Patrick throughout Ireland with Caílte and various other members of the pre-Christian past in the 5th century CE. By drawing on the work of other scholars I aim to support my findings in reading this text that, Saint Patrick is used to strengthen the Patrician Church, 'his church,' in the face of the encroaching English Church, and that Cas Corach is being presented as both a member of the pre-Christian Irish world and a successor to Caílte. Furthermore, the concept of a 'good pagan' and the liminality of Finn's Christianity will be examined as further proof of pre-established contemporary Christian influence throughout the text. This text acts as both a method of preserving Irish mythology and lore from the encroaching English conquests and pushing certain aspects of church reform in the face of a changing Irish social structure. This discussion will examine three key points: the authority of Saint Patrick and how it is used to guide social behaviors, the use of Cas Corach as a model for contemporary Irish nobles, learned men, and subjects, and the character of Finn Mac Cumaill and how he is used to represent the good pagan and a liminal space between Christianity and Paganism.

Democracy as a Social Practice : Tocqueville on Opinion, Conformity, and Power

Presenter: Leyla Mansouri

Although Alexis de Tocqueville's De La Démocratie en Amérique is frequently approached as a study of democratic institutions and the United States as a whole, Tocqueville devoted sustained attention to several different yet significant parts of the United States and its functions shaped by a democratic institution. This paper explores Tocqueville's analysis of democratic practices in ninteenth-century America by tracing the shift between Volume I (1835) and Volume II (1840), which combine institution, law, habit, and psychological tendencies shaped by democratic life. This paper uses Tocqueville's volumes and textual analysis, and explores explores how Tocqueville understood democratic power through conformity and administrative organization that shaped political ideology and behaviour beyond formal law. This paper further delves into his discussions of the tyranny of the majority, democratic conformity, public opinion, and administrative centralization, effectively highlighting fissures embedded within democratic practice in the United States. This paper is situated under historical context presented throughout Tocqueville's volumes, and showcases his contribution to understanding democracy as a lived, everyday social practice rather than purely as an institution-based ideology.

Session G: Health Sciences I

Friday, March 13, 1:15-2:30 PM

The 1966 Reading Room, Douglas Library

Moderator: Angélique Roy, Health sciences Librarian

The quality of research methods in studies quantifying the association between cancer diagnosis to treatment interval and overall survival: A systematic review protocol

Presenter: Vidhi Patel
Faculty Supporter: Dr. Timothy Hanna, Department of Oncology, Kingston Health Sciences Centre

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Background and Objective: Studies examining the association between cancer diagnosis to treatment interval (DTI) and overall survival (OS) are important to help inform clinical practice guidelines. Recent international consensus-based recommendations defined best practices for this area of research and raised concerns about the poor validity and inconsistent methodologies in the available literature. Our objective is to systematically assess the quality of studies investigating the association between DTI and OS using consensus-based methodological recommendations.

Methods: We are conducting a systematic review of observational studies published from 2020 onward that examine the association between DTI and OS in seven cancers with global relevance: bladder, breast, colon, rectal, lung, cervical, and head and neck cancers. We developed thorough search strategies to search Ovid MEDLINE, EMBASE, and Web of Science databases. Two rounds of screening will be performed in tandem using Covidence following predefined exclusion criteria and reliability procedures. Data extraction will be performed using Covidence with considerations for reliability and reconciliation. Methodological components will be evaluated against international consensus-based recommendations across domains including variable definition and measurement, cohort creation, confounder control, bias management, analytic techniques, and responsible data interpretation. Findings will be synthesized and presented using descriptive statistics.

Anticipated Applications: This review will provide a comprehensive assessment of methodological validity and consistency in recent studies investigating the association between cancer DTI and OS. The findings will highlight areas for improvement and support wider adoption of the consensus-based recommendations to strengthen future research in this area (Jalink et al., 2025).

References

Jalink M, King WD, Anderson BO, et al. Recommendations for studying the association of the cancer diagnosis to treatment interval with overall survival: a modified Delphi process. Br J Cancer. 2025;133:1526-1534. doi:10.1038/s41416-025-03158-3.

End-of-life Cancer Care Among Adults with Intellectual and Developmental Disabilities: Working with Advisors with Lived Experience

Presenter: Sophia Shi
Faculty supporters: Dr. Alyson Mahar, Dr. Rebecca Hansford, School of Nursing, Queen's University

Introduction: Intellectual or developmental disabilities (IDD) refer to conditions that affect intellectual, adaptive, and social skills that arise during the developmental period. Previous research indicates that adults with IDD are more likely to be diagnosed with advanced cancer and have lower rates of survival compared to non-disabled people. However, there is limited research examining end-of-life (EOL) cancer care among this patient population, and even less research documenting the lived experience of adults with IDD with cancer. This study considers EOL cancer care among adults with IDD as well as those involved in their circle of care, with an ultimate aim of identifying their barriers to equitable cancer care. This presentation highlights how our research team is intentionally building and engaging an advisory board of adults with IDD and family members to meaningfully guide the project.

Methods: Our 4-year mixed methods study examines EOL cancer care among this patient group using quantitative and qualitative approaches. We have developed advisory boards comprising 7 self-advocates, 4 family advocates, and 16 co-investigators to inform all steps of the study. Currently, we are in our qualitative phase of the project. Our advisory boards meet monthly to review and refine study materials, providing feedback on language, formatting, and procedural rules to enhance accessibility and inclusivity. In addition, structured dialogue sessions allow co-investigators, including clinicians and researchers, to engage directly with advocates to discuss equitable cancer care and EOL decision-making.

Conclusions: The advisory board deepens understanding of flexibility, inclusivity, and fostering a respectful space for discussion. They also reflect how lived experiences bring forward perspectives that researchers alone cannot capture through traditional research approaches. Importantly, engaging adults with IDD and their family members as partners, and not just participants, should be the norm to shift towards a more inclusive, patient-centred research practice.

The Heart Hears Harmony: An Experimental Study exploring How The Merry Go Round Of Life Music Piece Impacts Blood Pressure And Heart Rate

Presenter: Nehmat Badhan

Research consistently shows that classical music lowers blood pressure and heart rate. However, many studies rely on the same test music pieces (e.g. Moonlight Sonata), generalizing classical music and overlooking other works in the genre. Additionally, popular instruments like the piano and harp are consistently studied, leaving less mainstream instruments underexplored. Prior studies also present methodological limitations like inconsistent test pieces (e.g. improvised/randomized selections), and

variations in participant location and position. This study addresses these gaps by examining how the piano, harp, kalimba, and original orchestral version of The Merry Go Round of Life classical piece differentially affect the heart rate and blood pressure of high school students by using a novel music piece, underrepresented instrumentation, and an improved experimental design.

A quantitative experimental design was used involving 51 Grade 12 students recruited through simple random sampling and randomly assigned to one of four music conditions. Resting heart rate and blood pressure were measured three times using a non-invasive pressure cuff to establish baseline values. Participants then listened to a standardized 90-second segment of their assigned music version at a controlled volume while seated, stationary, and with eyes closed to minimize external stimuli, and results were measured. Data was analyzed using graphical analysis and one-sample t-tests to assess statistically significant changes in heart rate and blood pressure across conditions.

Results demonstrated that the piano cover significantly decreased diastolic blood pressure, while the harp cover significantly decreased systolic blood pressure. In contrast, the original orchestral version produced significant increases in heart rate and diastolic blood pressure, likely due to increased auditory complexity/stimulation. No statistically significant effects were observed for the kalimba condition. These findings contribute to the field of music therapy by broadening the range of cost-effective, non-invasive music pieces available for cardiac patient care.

Integrating Anti-Racism in Health Education: Evaluation of an Innovative Racism and Health Course at Queen's University

Presenter: Bisola Olaseni
Faculty supporter: Dr. Giselle Valarezo, Faculty of Health Sciences, Queen's University

Systemic racism embedded within health education contributes to persistent health inequities, yet anti-racism training remains inconsistently integrated into undergraduate health sciences curricula in North American contexts. In response to identified gaps, Queen's University developed GLPH 281: Racism and Health in Canada, a semester-long, credit-bearing course co-designed by faculty, students, and teaching assistants and embedded within the Bachelor of Health Sciences program. This study documents the implementation and evaluation of the pilot offering of GLPH 281, with the aim of identifying best practices for sustainable anti-racism education in health sciences. Using a mixed-methods design, students completed pre- and post-course surveys, questionnaires and weekly student feedback. Quantitative data were analyzed using descriptive statistics, while qualitative data underwent iterative and reflexive thematic analysis using NVivo and Microsoft Copilot. Results demonstrate measurable improvements in students' self-reported confidence and knowledge engaging with racism and health, with composite survey scores increasing across the cohort over the semester. Qualitative analysis further revealed that students highly valued discussion-centered learning, diverse instructional teams, and applied case-based activities, which were perceived as central to creating safe and engaging learning environments. Concurrently, findings identified challenges including content

density, an inherent difficulty of meaningfully representing the breadth and diversity of racialized communities in Canada, and some misalignment between assessments and learning objectives, highlighting the constraints in delivering comprehensive anti-racism content within a single course. This study addresses critical gaps in the literature by evaluating a longitudinal, credit-bearing, and collaboratively designed anti-racism course situated within the Canadian socio-historical context. By documenting both outcomes and implementation processes, it offers a replicable and scalable model for integrating anti-racism education into undergraduate health sciences curricula and contributes evidence to support systemic curricular reform toward culturally safe and socially accountable healthcare training.

Selective Therapeutic Response to Faricimab in a Coats' Disease Variant with Cystoid Macular Edema: A Case Study

Presenter: Tyler Rotholz

Adult-onset Coats' disease is a rare retinal vasculopathy which mimics more common conditions such as branch retinal vein occlusion (BRVO), creating diagnostic challenges and delaying appropriate treatment. While anti-vascular endothelial growth factor (anti-VEGF) agents and laser photocoagulation are commonly used, optimal management remains unclear. This retrospective study describes the diagnostic process and therapeutic response in a patient with an adult-onset Coats' disease variant complicated by refractory cystoid macular edema (CME), including treatment with Faricimab (Vabysmo), which has not previously been reported for this indication.

A retrospective review was conducted for a 59-year-old male who presented with progressive vision loss in the left eye and was initially diagnosed with BRVO. The patient underwent sequential therapy with intravitreal aflibercept (ten injections), bevacizumab, ranibizumab, and intravitreal triamcinolone, without sustained anatomic or visual improvement. Persistent CME prompted further investigation using fluorescein angiography, which demonstrated telangiectatic retinal vessels with extensive lipid exudation, leading to a revised diagnosis of adult-onset Coats' disease. Focal and peripheral laser photocoagulation was performed; however, CME persisted. Given the disease course, treatment was pivoted to intravitreal faricimab injections.

At presentation, visual acuity was 20/250 in the affected eye with a central retinal thickness (CRT) of 550 µm. Despite anti-VEGF monotherapy and laser treatment, CRT increased to 659 µm with visual acuity declining to 20/400. Intravitreal triamcinolone produced only transient anatomic improvement without visual benefit. Following initiation of faricimab, progressive anatomic and functional improvement was observed. CRT decreased to 301 µm after three injections, with visual acuity improving to 20/200. After five treatments, CME resolved completely, with CRT measuring 256 µm and visual acuity improving to 20/150. No treatment-related adverse events were observed.

This case highlights the importance of multimodal imaging in atypical retinal vascular disease and suggests that faricimab may represent a novel therapeutic option for refractory adult-onset Coats' disease variants.

Session H: Health Sciences II

Friday, March 13, 2:30-3:30 PM

The 1966 Reading Room, Douglas Library

Moderator: Amy Rutherford, Health Sciences Librarian

Comparative Analysis of Actigraphy-Derived Indices in Alzheimer's Disease and Healthy Controls using UK Biobank Data

Presenter: Haarini Suntharalingam
Faculty supporter: Dr. Nasim Montazeri, Department of Electrical and Computer Engineering, Queen's University

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Disrupted circadian rhythms are common in Alzheimer's disease (AD) and are associated with sleep fragmentation, behavioural symptoms, and cognitive decline. Despite this, objective characterization of circadian and rest–activity disturbances in AD using real-world wearable sensor data remains limited. Actigraphy, derived from wrist-worn accelerometry, offers a non-invasive method for quantifying habitual activity patterns and circadian organization over extended monitoring periods. Using raw 7-day wrist-worn accelerometry data from the UK Biobank, this study compared rest-activity patterns between 50 participants with AD and 50 healthy controls. Data were processed to extract circadian and activity metrics and group differences were assessed using appropriate statistical tests. AD participants exhibited lower overall activity (Mesor), most active 10 hours (M10) and least active 5 hours (L5) compared with controls, while variability in acrophase was greater in the AD group, suggesting disrupted circadian timing. Visual inspection of 24-hour ENMO profiles confirmed attenuated day-night activity contrast in AD participants. These findings indicate that actigraphy can capture measurable differences in activity and circadian patterns in AD, supporting its potential as a non-invasive tool for screening or monitoring disease-related changes.

Barriers to Access: Exploring Treatment Challenges Faced By Pediatric Cancer Patients In Uganda

Presenters: Julia Apolot, Dream Tuitt-Barnes, Oreoluwapo Maxwell, Ali Haider, Alisha Higgs, Fatima Mohammed, Heeya Patel, Mujeedat Lekuti, Oluwamisimi Oluwole, Rinusha Piranthapan, Rida Siddiqui

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Lower-income countries are grappling with a disproportionate and underaddressed pediatric cancer (PC) burden. Estimates suggest that by 2050, nearly 50 percent of childhood cancer cases will be concentrated in Sub-Saharan Africa, yet survival rates are as low as 10% in some countries. In 2018, the WHO established the Global Initiative for Childhood Cancer, advocating for a global PC survival rate above 60% by 2030. Unfortunately, many Sub-Saharan African countries, including Uganda, are

projected to fall short. Despite providing subsidized cancer care, Uganda's PC mortality rate is 70%, compared to 20% in North America. This review explores contributing factors and proposes interventions to reduce this survival disparity.

A 12-member team from Queen's Cancer Kids First conducted a literature review, searching PubMed, ScienceDirect, and Google Scholar. Twenty-five English articles published post-2014 were selected, including two from The Monitor, a Ugandan newspaper, for national insight.

Our review highlights the link between Uganda's high PC mortality rate and institutional, national, and patient-level barriers to timely diagnosis and treatment. Key institutional barriers include limited diagnostic services, medications, and oncologists. While national and patient-level barriers describe the concentration of healthcare in Kampala, financial constraints, and cultural stigmas around cancer.

Recommendations include expanding diagnostic infrastructure via telemedicine, providing travel and accommodation support, and increasing awareness to reduce stigma. Additional strategies involve international partnerships, drug shortage tracking, and implementing cost-effective regimens aligned with WHO-CHOICE guidelines. Lastly, establishing professional development programs to empower rural healthcare practitioners to screen for childhood cancers, allowing for earlier diagnosis, intervention, and improved survival.

Using AI to Improve Radiation Therapy Planning

Presenter: Patrik Farkas

In radiation therapy, clinicians must outline nearby organs, known as organs at risk (OARs), to limit unwanted radiation exposure. This process is traditionally done by hand and requires significant time and resources. Artificial intelligence (AI) tools can automatically generate these outlines, potentially improving efficiency. However, their clinical reliability across different treatment sites must be carefully evaluated.

We analyzed various patient cases across multiple anatomical sites, including thoracic, head and neck, breast, and pelvic regions. Clinician-created manual contours were compared with AI-generated contours from two treatment planning systems: Ethos-2 and RayStation 2023B. Quantitative agreement was assessed using standard image comparison metrics, along with an evaluation of radiation dose differences to critical organs. In addition, a qualitative clinical evaluation was performed for lung cases, where radiation oncologists evaluated contour acceptability and clinical use.

Across all treatment sites, AI contours showed strong agreement with manual contours and resulted in minimal differences in delivered radiation dose. Larger and commonly contoured organs, such as the lungs and heart, demonstrated particularly good performance. Some smaller and complex structures, especially in head and neck and GI cases, showed reduced agreement, though these differences generally had little impact on dose. In the lung qualitative review, clinicians found most AI contours acceptable, but certain structures (notably the esophagus and heart) were more frequently flagged due to anatomical inaccuracies rather than safety concerns.

In conclusion, AI-based segmentation performs well across multiple anatomical sites and is dosimetrically safe for clinical use. However, clinician review remains essential, as quantitative accuracy alone does not fully capture clinical acceptability. Continued model refinement will further enhance the clinical integration of AI contouring tools.

Investigating the Impact of Electrical Stimulation on Osteocyte Cells and Breast Cancer Cell Regulation

Presenter: Komal Azeem
Faculty supporter: Dr. Lidan You, Department of Mechanical and Materials Engineering, Queen's University

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Traditional cancer therapies such as chemotherapy and radiation are highly effective but often result in severe side effects that significantly impact patients' quality of life. Recent research has highlighted electrical stimulation (ES) as a promising non-invasive complementary approach to target cancer cells with reduced toxicity. Osteocytes, the most abundant bone cells, contribute to cancer-related bone metastasis by releasing growth factors and signalling molecules that create permissive environments for metastatic breast cancer cells. This study investigated whether ES could modulate osteocyte behaviour and subsequently influence breast cancer cell proliferation, with potential applications in game theory-based cancer treatment strategies that target weaker cells first to enhance the effectiveness of conventional therapies against resistant populations.

MLO-Y4 osteocytes were subjected to electrical stimulation at two frequencies (10Hz and 50Hz) for one hour, with control groups maintained without stimulation. Following ES treatment, conditioned media from stimulated osteocytes were transferred to MDA-MB-231 breast cancer cell cultures. Cell density changes were documented through daily imaging at standardized reference points across all experimental groups. Dead cell counts were performed using hemocytometer analysis to assess cell viability across treatment conditions.

Preliminary protocol development successfully established reproducible ES parameters and transfer procedures for investigating osteocyte-cancer cell interactions. Analysis of cell density changes and viability data will determine whether ES-treated osteocytes release factors that inhibit breast cancer cell growth. If confirmed, these findings would support ES as a cost-effective, non-invasive complementary therapy that could reduce tumour burden while enhancing traditional treatment efficacy. Future research should explore additional ES frequencies, extended stimulation durations, and molecular characterization of osteocyte-released factors to optimize therapeutic protocols and improve cancer patient outcomes.

Trends in Eligibility Criteria in Solid Tumor Systemic Therapy Trials Over Time

Presenter: Jenny Han
Faculty Supporters: Dr. Rebecca Hansford, School of Nursing, Queen's University, Dr. Brooke Wilson, Sinclair Cancer Research Institute, Dr. Consolacion Molto Valiente

Background: Cancer clinical trials have used restrictive eligibility criteria, limiting patient access and the generalizability of findings. In response, FRIENDS and ASCO issued recommendations to modernize eligibility criteria in 2017 and 2021. We evaluated whether these recommendations led to measurable changes in eligibility criteria in systemic therapy trials for solid tumours by comparing trial protocols at two points across a 10-year period.

Methods: We reviewed randomized clinical trial protocols evaluating systemic therapies for solid tumours published in 2012-2013 and 2022-2023 in the New England Journal of Medicine, The Lancet, and Lancet Oncology. Eligibility criteria aligned with FRIENDS recommendations, including HIV status, brain metastases, and organ dysfunction, were extracted. Descriptive statistics included counts and proportions for categorical variables and means (standard deviation) or medians (interquartile range) for continuous variables. Comparisons used chi-square tests, independent t-tests or Mann-Whitney U tests, as appropriate.

Results: We included 42 protocols from 2012–2013 and 98 from 2022–2023, predominantly phase III trials. Recent trials targeted gastrointestinal, genitourinary, and lung cancers (25.5%, 18.4%, and 18.4%), compared to older studies that primarily examined breast, skin, and gastrointestinal cancers (33.3%, 11.9%, and 14.3%). Cancer treatment types have also shifted from a higher proportion of chemotherapy to immunotherapy interventions in more recent trials. Exclusion of patients with brain metastases decreased from 71.4% (2012-13) to 33% (2022-23). Conversely, exclusion of people living with HIV increased (2012-13: not mentioned 64.3%; excluded 35.7%; 2022-23: not mentioned 21.4%; included with caveat 9.2%; excluded 69.4%). Disability was rarely explicitly addressed; however, consent-related and nonspecific exclusion criteria suggested potential indirect exclusion.

Conclusion: Despite progress in select domains, areas such as HIV status, require further work to broaden criteria and better reflect the real-world populations. Our findings highlight the need for clearer and more equitable eligibility standards, thereby improving external validity and equity in cancer research.