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Cannabis and Inflammatory Bowel Disease

PhD

Abstract

The experiences of patients in Saskatchewan surrounding Medicinal Cannabis in Inflammatory Bowel Disease

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Background

Inflammatory bowel disease (IBD) is a chronic inflammatory condition of the gastrointestinal tract. The goal of IBD treatment is to target inflammation, manage debilitating symptoms, and induce disease remission. Conventional medical treatment may have modest clinical effectiveness and therefore, IBD patients are increasingly using complementary and alternative medicines (CAM) such as Cannabis. Cannabis use in IBD is an evolving area of investigation despite its extensive history in other medical conditions. Cannabinoids, the key active components of Cannabis, have anti-inflammatory properties through their interaction with the CB2 receptor, which modulates immune cell function. The therapeutic relevance of Cannabis in IBD has yet to be translated to humans due to the lack of clinical trial data to establish safety and efficacy in IBD. However, observational studies suggest improvements in symptom management and quality of life (QoL) as the primary reason for its use in the IBD population. Both the use of Cannabis and IBD incidence is projected to increase making this a high priority for research in the Canadian Healthcare system. With clinical evidence lagging the rising use, opportunity exists to learn from IBD patients at the forefront of Cannabis use. A deeper understanding of the experiences influencing Cannabis use from patients' perspectives may provide solid insight into the current situation in Saskatchewan.

Purpose

To examine the experiences of Saskatchewan IBD patients surrounding Cannabis use as part of IBD treatment to further explain the enablers and barriers impacting its use, disease outcomes, and quality of life.

Methods

This study will follow a mixed methods sequential explanatory design consisting of 2 distinct phases, quantitative followed by qualitative (QUAN qual). Quantitative data first will be collected and analyzed from an online patient survey sent to IBD patients in Saskatchewan. This survey will help to identify among users and non-users of Cannabis preliminary demographic information, attitudes, knowledge, patterns/reasons for use, and barriers impacting its use. In the second qualitative phase, the data will help explain or elaborate on the quantitative results from the first phase. This will involve data collection through a semi-structured interview process using a convenience sample of IBD patients. The qualitative data will help elaborate on the quantitative results, however, share equal priority and are connected in the intermediate stage of the study. This study also includes patient partners during all phases of the research using the SPOR patient engagement framework.

Data Analysis

Descriptive statistics will be used to summarize respondent's demographic information, attitudes, beliefs, knowledge, as well as determine the prevalence, reasons and barriers preventing Cannabis use among and between groups from the patient survey. Means with corresponding standard deviations and proportions with their corresponding 95% confidence intervals will be reported. Categorical variables will be compared using Chi-square statistics, continuous variables and groups will be compared using t-tests, Wilcoxon rank-sum tests, or one-way ANOVA as appropriate. The open-ended comments deemed relevant to the research objectives will be analyzed using content analysis. The patient interviews will be transcribed and analyzed using a qualitative descriptive (QD) approach and thematic analysis by Braun and Clarke to identify themes and patterns in the data. The analysis and data management will use Excel, SPSS and NVivo Statistical software.

Results

Preliminary data from the patient survey is undergoing statistical analysis as part of phase one of the mixed method study to further direct the second qualitative phase.

Conclusion and Outcome

This study will be the first in Saskatchewan to engage IBD patients as partners in the research process. This study design provides a platform for IBD patients directly involved with cannabis to voice their perspectives and share first-hand their experiences within the current healthcare system. A deeper understanding of the barriers and drivers impacting its use may help identify strategies for improving safe and effective use as part of IBD treatment. Ultimately, this may improve treatment, disease outcomes, and QoL for IBD patients in Saskatchewan.

Amanda Gannon

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Community Health and Epidemiology

Health, Community Health

Master

Abstract

Background: In Saskatchewan, youth substance use strategies are frequently informed by abstinence, which does not resonate with everyone. Youth experiences with substance use are influenced by complex individual and intersectional identities within the context of family, peers, community, and culture. Due to these complex realities, health and social services fail to consistently meet the needs of youth across the complexity of intersectional backgrounds. Harm reduction is an approach to substance use where individuals reduce the harms of their specific behaviours without the expectation that the substance use will stop. Unfortunately, there is a lack of research in Saskatchewan on youth-centered harm reduction approaches that honour the complex identities and unique worldviews of urban youth. It is not clear how well youth are supported in Saskatoon to engage in harm reduction. Purpose: This project will elicit the experiences of harm reduction from community youth in Saskatoon, Saskatchewan to better support community youth engagement in harm reduction. Methods: This community-based, exploratory, photovoice project will be conducted in collaboration with Chokecherry Studios, The Students Commission of Canada, and a youth advisory committee. Participants will capture photographs that illustrate their experiences with harm reduction in the community and participate in two sharing circles or one-on-one interviews to discuss their photographs. Participants will discuss supports and barriers that currently exist in the community, and ways moving forward to better support community youth engagement in harm reduction. Conclusion: This project has the potential to support the health and wellness of youth and their loved ones in the community. Results of this project may offer service providers and community leaders information on how to best support youth-centered harm reduction engagement.

Video Link

https://youtu.be/jGiXWe9wfS4

Rafaello Luciano

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Mechanical Engineering

Fluid Mechanics

PhD

Abstract

Hemorrhagic strokes, which occur mainly due to brain aneurysms rupturing, are a significant cause of worldwide mortality and disability-adjusted life years lost. Physicians and patients are frequently faced with the dilemma of whether to treat a newly found unruptured aneurysm, as there are still many uncertainties when trying to predict the risk of rupture and treatment outcomes. Treatment decision-making currently relies on general population statistical criteria, rather than on a thorough understanding of the patient's specific condition. Computational fluid dynamics (CFD) simulations based on patient-specific reconstructions of arteries and aneurysms can provide more relevant information than statistical criteria, but these simulations are not yet considered a reliable tool to guide the clinical management of this disease. The simulation of blood flow in arteries presents multiple unsolved challenges related to the prediction of complex, three-dimensional, pulsatile flows at the edge of turbulence. For this project, a step-by-step approach exploring these challenges, with progressively increasing complexity for each step, was adopted. This presentation will first cover the initial exploration of the simulation of the classical engineering geometry of a pipe with an axisymmetric expansion; it is also a flow at the edge of turbulence that similarly exhibits localized transition from laminar flow to turbulence. Then, results of realistic aneurysm simulations will be presented. Despite the low fluid velocities and the popular assumption of laminar flow, the flow is shown to be turbulent.

Video Link

https://usask.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=6a199bbc-e84e-46f7-9e5f-ae2b0170dd33

Marina Beshara

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Anatomy, Physiology and Pharmacology

Aging, Geriatrics, Pediatrics, Genetics, Genomics, Nutrigenomics, Biochemistry

Master

Abstract

Title: Detecting Critical Genetic Targets Against Aging and Aging-Related Diseases Using a Novel Premature Aging Model Aging is a universal and complex biological process, characterized by the gradual loss of cellular and tissue function over time. As we age, changes in cellular structures and pathways lead to accumulated DNA damage, increasing the likelihood of developing aging-related diseases (e.g., heart attacks, dementia and cancer). There are significant gaps in knowledge regarding biological machinery and how these mechanisms regulate human aging, life expectancy and overall health. To overcome this challenge, we have incorporated a rare disease model of Progeria to provide insight into disrupted biological pathways and altered genes in normal and disease states. Progeria is a rare and incurable genetic condition that leads to rapid aging and premature death in children. The condition arises in patients with inherited changes in genetic background, producing a toxic protein called progerin. This protein progressively destabilizes the nucleus, the centre of the cell containing chromosomes and DNA. With time, progerin accumulation impacts the nuclear structure, triggering accelerated aging and early cell death. The mechanisms of aging are evolutionarily conserved, meaning this essential process has remained unchanged through evolution and is shared across various organisms (e.g., humans and yeast). Our goal is to use a simple single-celled yeast model of Progeria, to facilitate our understanding about the complexities of aging. We will accomplish this by translating the human disease into yeast genetic material, to exhibit the same cellular disruptions seen in human Progeria. This model will help identify unknown critical genes involved in normal and accelerated aging, by performing a genetic screen from a yeast-based gene library. We will detect and contrast genes that interact with progeria, by exhibiting characteristics of accelerated aging and premature cell death, similarly seen in human Progeria. Additionally, we will compare genes that reverse growth features of accelerated aging, by displaying increased cellular longevity and healthspan. Our findings will further investigate notable modifier genes, involved in pathways regulating the expression of progerin in aging and aging-related diseases.

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Department of Chemical and Biological Engineering

Technoeconomics of Canola Proteins from Cold Press Canola Meal

Master

Abstract

Growing global population will place increased pressure on the world's resources to provide diverse forms of food. Ensuring enough protein is available to feed our world's population is essential. Increasing demand for animal proteins will have a negative environmental impact requiring more land, water, and energy. These calls for the transition towards more sustainable food consumption that is environmentally beneficial. Addressing this will necessitate sustainable production of existing and alternative protein sources for the future. Canola is the second-largest oilseed in the world both in terms of seed and meal production. Canola meal, a by-product of canola oil extraction, is a rich protein source. Canola proteins can be a suitable alternative protein in food applications for human consumption. However, the current canola oil processing technologies involves high-temperature operations that degrades the nutritional and functional quality of the meal, making it unsuitable as a feedstock for protein extraction. A low-temperature oil extraction process producing a cold press canola meal that will preserve the protein structures without denaturing it will aid the protein recovery from canola meal. These will benefit the canola protein industry and sustainable use of proteins. Successful implementation and commercialization of any developed technology would require a detailed analysis of the technology and its economic feasibility. My research focuses on evaluating the costs and profitability of the cold-press canola protein extraction technology for efficient extraction of protein products from cold press canola meal by conducting a techno-economic analysis (TEA) of the cold-press canola protein process.

Geneveave Barbo

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College of Nursing

Health equity, global health, migrant health, health services

PhD

Abstract

Title: Exploring barriers and solutions to inaccessible mental health services experienced by minor refugees and asylum seekers Abstract Globally, over 84 million people were forcibly displaced in 2021 due to conflicts, violence, socio-cultural discord, economic hardship, human rights violations, and environmental issues, resulting in an escalating number of refugees and asylum seekers. Minor refugees and asylum seekers, who make up about half of those displaced, experience significant stress through their resettlement process which heightens their chances for developing mental health difficulties. Cultural, linguistic, and social barriers may impede their access to appropriate mental health care in host countries, increasing the risk for psychological traumas and physical conditions, while decreasing life expectancy and ability to achieve future contribution to society. Access to mental health services worsened during the COVID-19 pandemic and escalated xenophobia. This study aims to explore barriers faced by minor refugees and asylum seekers in accessing mental health services within host countries and to identify possible solutions. Guided by intersectionality theory and participatory action research, this sequential mixed methods study will consist of cross-sectional survey design and constructivist grounded theory. Completed questionnaires will be analyzed using descriptive and inferential statistics. Findings from the survey will then inform the interview guide. Semi-structured individual interviews and focus group sessions will be recorded, transcribed verbatim, coded, and analyzed concurrently as data collection using inductive analysis. Other related sources of data will be sought to ensure triangulation. This study is likely to inform minor refugees and asylum seekers' mental health care needs and the creation of an intervention program (by youth and for youth) that will enhance their access to services.

Video Link

https://youtu.be/tYOBdT30nq4

Khaled Zoroufchi Benis

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Chemical Engineering

Environmental Engineering

PhD

Abstract

Arsenic is a global environmental health threat impacting millions of people in countries across all five continents. It is one of the most toxic elements, a known carcinogen with exposure leading to skin, lung, and bladder cancer, and can lead to other diseases such as diabetes and cardiovascular disease. In many Canadian provinces, arsenic levels have been reported to be much higher than the maximum acceptable concentration (10 parts per billion, or ppb in drinking water). For example, these reports include measured concentrations of 368 ppb in school wells in Newfoundland, to 650 and 5,340 ppb in rural and urban areas of British Columbia and Alberta, respectively. Among the presently available technologies for removing arsenic from water, adsorption is one of the best methods due to its simplicity, relatively low cost, and the potential for adsorbent regeneration. A wide variety of adsorbents derived from various sources such as modified activated carbons, gels, and resins have been utilized for the removal of metal(loid) from water. Despite the relatively low cost of adsorption as compared to other treatment methods, the current research project aims to use agricultural residue-based materials as a cost-effective and eco-friendly alternative to the more expensive commercial adsorbent. Agricultural residues in Canada can provide an abundant source to develop inexpensive adsorbents and benefit the agricultural economy by increasing the value of the agricultural residues. We have developed a novel electrochemical method to make agricultural wastes as arsenic adsorbent. This method is easy to use, time effective and cheap that can improve the arsenic adsorption capacity of the agricultural wastes like wheat and canola straw or other cereal straws more than 30 time by deposition iron oxide on their surface that acts as like glue to uptake arsenic from water. Also, this method can create a new income avenue for farmers in Canada and Saskatchewan by using agricultural wastes.

Vincent Maranda

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Health Science

Health Science

PhD

Abstract

Ovarian clear cell carcinoma (OCCC) is the second most common type of ovarian cancer affecting approximately 10-13% of women with ovarian tumors. OCCC is also the predominant histologic type of gynecological malignancy that harbors activating mutations within the telomerase reverse transcriptase (hTERT) promoter, causing its increased expression. Overexpression of hTERT is linked to tumorigenesis and inhibiting this enzyme is seen as a powerful antitumor strategy. While this led to multiple telomerase-targeting approaches, disappointingly, none have been successful in clinics. My doctoral thesis aims to apply the concept of synthetic dosage lethality (SDL), where overexpression of a gene like telomerase will cause lethality with a concurrent loss of a second gene. Using a genome-wide screen done previously, I have shortlisted 194 SDL hits from genome-wide CRISPR screens previously done in our lab, and my key objective now is to identify and validate most optimal targets that will be applicable to OCCC treatment. Hypothesis: I hypothesize that genes whose loss-of-function causes lethality, only when hTERT is overexpressed, represent targetable vulnerabilities in OCCC tumors. Objectives: My objectives are: 1) Evaluate the loss-of-function of all 194 SDL hits in OCCC xenograft tumors, using a novel CRISPR-based in vivo pooled screening approach. 2) Perform a screen with a library of ~1800 FDA-approved small molecule inhibitors (SMIs) in telomerase overexpressing cell lines and validate anti-cancer efficiencies of the top three most efficient SMIs which eliminate telomerase overexpressing OCCC cells. 3) Finally, I will test combinations of SMIs and silencing SDL hits in hTERT overexpressing OCCC models to identify optimal treatment combinations and maximize tumor elimination. Significance: My study directly addresses the important clinical need for effective treatments for OCCC patients. This investigation will identify new targets exploiting hTERT overexpression and provide preclinical evidence to support the development of novel OCCC therapies.