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MURC

PROGRAM GUIDE

**MULTIDISCIPLINARY
UNDERGRADUATE
RESEARCH
CONFERENCE**

MAR 16 2019 // UBC VANCOUVER // #UBCMURC

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BE SOCIAL

WE ARE EXCITED TO BE LIVE-STREAMING ANY DIGITAL CONVERSATIONS THAT TAKE PLACE THROUGHOUT THE DAY DURING THE OPENING AND CLOSING KEYNOTE SESSIONS. IF YOU WANT TO JOIN THE CONVERSATION ONLINE, USE #UBCMURC. SHARE THE HIGHLIGHT OF YOUR DAY, SOMETHING NEW YOU LEARNED OR SHARE PHOTOS!

SCHEDULE

Get an overview of the day.

8:00AM - 8:45 AM	Registration for Presenters and Attendees	Ponderosa Commons: Oak House Foyer
9:00AM - 9:45 AM	Opening Remarks and Keynote Dr. Benjamin Cheung	Centre for Interactive Research On Sustainability (CIRS) Room 1250
10:00AM - 11:10AM	First Wave Poster Presentations Oral Presentations	Ponderosa Commons: Oak House Ballroom Rm. 1001, 1002, 1003, 1009, 1215
11:20AM - 12:30PM	Second Wave Poster Presentations 5 Oral Presentations	Ponderosa Commons: Oak House Ballroom Rm. 1001, 1002, 1003, 1009, 1215
12:30PM - 2:00PM	Lunch Break Graduate Student Panels	Ponderosa Commons: Oak House Graduate Student Panels
2:00PM - 3:10PM	Third Wave Poster Presentations Oral Presentations	Ponderosa Commons: Oak House Ballroom Rm. 1001, 1002, 1003, 1009, 1215
3:20PM - 4:30PM	Fourth Wave Poster Presentations Oral Presentations	Ponderosa Commons: Oak House Ballroom Rm. 1001, 1002, 1003, 1009, 1215
4:30PM - 5:00PM	Break Photobooth	Ponderosa Commons: Oak House Foyer
5:00PM - 6:30PM	Awards Reception	Ponderosa Commons: Oak House Ballroom

WHAT IS MURC?

Celebrating exciting and innovative undergraduate research at UBC.

The Multidisciplinary Undergraduate Research Conference is an annual celebration of undergraduate research happening on the UBC campus. Student researchers showcase their research in an oral or poster presentation format. Work presented at the conference includes undergraduate theses, directed studies and other faculty-supervised research projects.

MURC 2019 features over 260 presentations hosted by more than 400 presenters. Ten (10) faculties and schools at UBC are represented in our conference.



STUDENT PRESENTERS GAIN
VALUABLE EXPERIENCE AND
TRANSFERABLE SKILLS BENEFICIAL
TO THEIR FUTURE IN RESEARCH
AND OTHER PATHS.

MURC 2020 WILL BE A FANTASTIC OPPORTUNITY FOR YOU TO SHOWCASE YOUR RESEARCH WITH THE UBC COMMUNITY, AND EXCHANGE IDEAS WITH OTHER STUDENT RESEARCHERS.

Passionate about Research?

JOIN US NEXT YEAR

CONFERENCE SPEAKERS

Learn from exceptional leaders in research on our campus

Dr. Benjamin Cheung

Lecturer

Dr. Benjamin Cheung is a Lecturer and Indigenous Initiatives Coordinator in the Department of Psychology at the University of British Columbia. His research interests include the scholarship of teaching and learning, cultural psychology and student engagement.



"I encourage all of you to remember the importance of mentorship so that, as you move to other chapters in your life – in academia, in your social circle, or any other domain – you can give someone else the gift of mentorship."

He teaches a variety of courses at UBC involving research methods, social psychology and cultural psychology. Dr. Cheung is heavily involved in student engagement and passionate about the education of his students. As the guest speaker at MURC, he will be talking about mentorship in academia.

3MT Finalists

Every year, the Graduate Pathways to Success program holds a competition in which graduate students summarize the breadth and significance of their research to a general audience in 3 minutes. Finalists of this competition are invited to speak at the conference as their capabilities in effectively communicating their research to a diverse audience encompass one of the cornerstone principles of MURC.

PLANNING COMMITTEE

Meet the team

STAFF ADVISORS

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Irene Chou

PROGRAM ASSISTANTS

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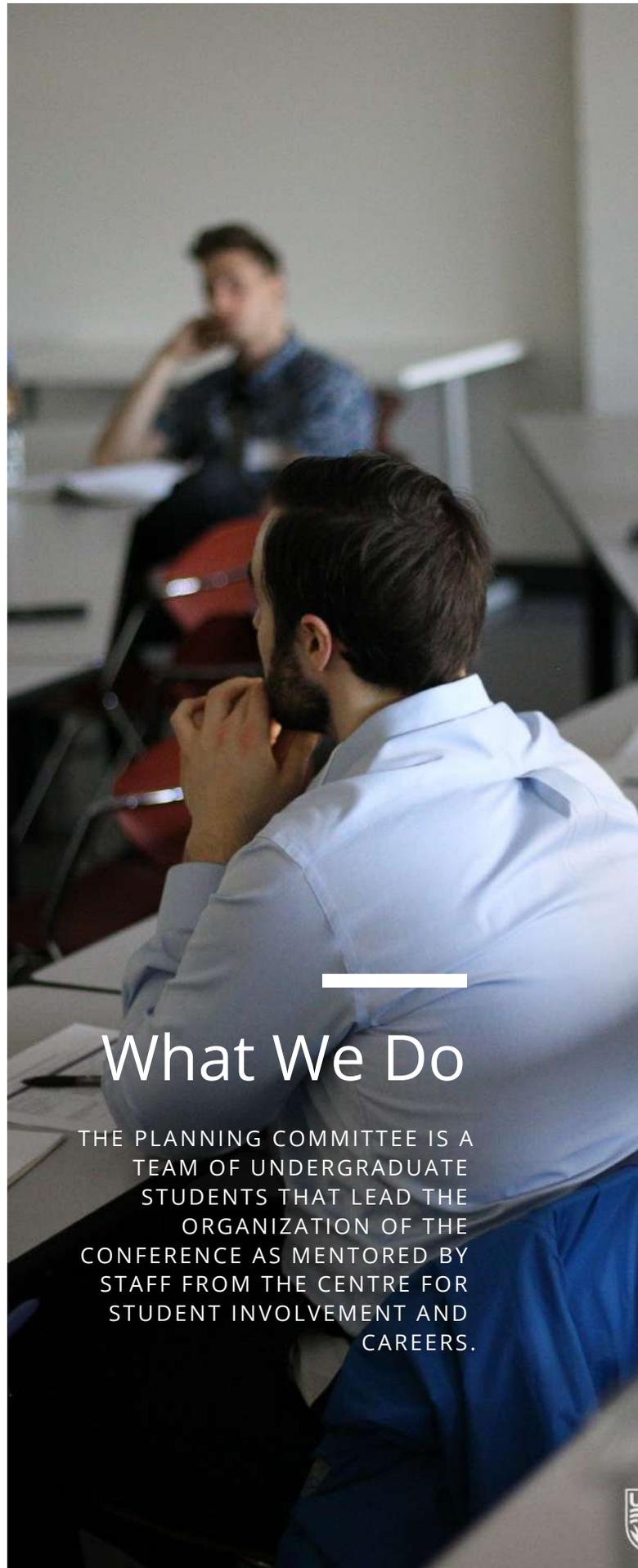
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VOLUNTEERS DIRECTORS

Catherine Gai
Nick Hsieh

COMMUNICATIONS AND PROMOTIONS DIRECTORS

Julia Zhu
Alyssa Chen



What We Do

THE PLANNING COMMITTEE IS A TEAM OF UNDERGRADUATE STUDENTS THAT LEAD THE ORGANIZATION OF THE CONFERENCE AS MENTORED BY STAFF FROM THE CENTRE FOR STUDENT INVOLVEMENT AND CAREERS.

GUEST PRESENTERS

Showcasing exceptional research in other institutions

A new initiative undertaken by the conference this year was the extension of the invitation to present at MURC to nearby universities. Our goal was to recognize the diverse and impressive research happening at the undergraduate level outside of UBC. One of the foundations of the conference is the recognition that research comes from every discipline. Our hope for the future is to present MURC as a connective platform to share the wide and varied range of expertise demonstrated by students from other schools.

This year, we invited a select number of guest presenters from Emily Carr University of Art and Design, Vancouver Island University and University of Victoria to showcase their research.

EMILY CARR UNIVERSITY OF ART AND DESIGN

Celine Hong

Sam Talbot

VANCOUVER ISLAND UNIVERSITY

Rae Wilson

Melynda Bergen

Csilla Vasarhelyi

UNIVERSITY OF VICTORIA

Robyn Sahota

WAVE 1 | ORAL PRESENTATIONS

LIST | 10:00AM - 11:10AM

Ponderosa Commons: Oak House, 6445 University Boulevard



PCOH 1001

Helping the Spinal Cord: Biomarkers of Acute Spinal Cord Injury Rishab Gupta

Association between Physical Activity Levels and Cardiovascular Risk Factors in Person Living with Type 1 Diabetes Alex Liu
Jennifer Lam

Pong during Wake-a-Thon's - a Test for Vigilance Fluctuations due to Sleep Deprivation? Radi Khalili

Orbitofrontal interactions with the amygdala differentially influence efficient risk/reward decision-making Nicola Symonds

A review of the use of GIS in antibiotic resistance studies Tracy Wang

PCOH 1002

Improving Cardiorespiratory Fitness in Breast Cancer Survivors: The Breast Cancer and Physical Activity Level (BC-PAL) Trial Maya Liepert

Intergenerational Educational Mobility over the Past Century in Canada Alex Chow

ADD diagnostic app: exploring healthcare accessibility and innovation Giulio Pregnolato
Kalen Forrester
Han Nguyen

How does drought impact plant performance and arbuscular mycorrhizal colonization on corn (*Zea mays*) and wheat (*Triticum aestivum*)? Melody Fu

PCOH 1003

A microscope story of evolution, cooperation and enslavement Mitch Syberg-Olsen

X-ray Crystal Structure Reveals O-Acetylpeptidoglycan Esterase (Ape1) as a Potential Target for Drug Design Against Bacterial-Induced Gastroenteritis	Ian Yen
The role of Isocitrate dehydrogenase (IDH) epigenetic mutation in Glioblastoma Malignant Transformation	Asana Khajavi Negin Askari-Bayazi Tavleen Kaur Ramgarhia
Links Between High-Arousal Positive Affect, Perceived Partner Closeness, and Physical Activity in the Everyday Life of Stroke Survivors and their Partners	Izzie Fortuna

PCOH 1008

Cardiovascular Health Benefits of Exercise Training in Persons Living with Type 1 Diabetes	Jacklyn Ku
Does economic inequality increase the consumption of status goods?	Shali Tayebi
Assessing Student Knowledge and Usage of Cannabis at a University: A Knowledge, Attitude, Practice Study	Sophie Harasymchuk Dilpreet Bharaj Tanner Jones
Building Expressive Data Visualizations for Communicable Disease Outbreak Investigations	Shannah Fisher
A review of the Forest Rights Act in India as it concerns aspects of Adivasi life and identity	Rayan Moodad Pulkit Aggarwal Nikki Rao

PCOH 1215

Adolescent Cancer Patient Referral and Driving Time in BC	Avril Li
Not Trusting The State, Not Trusting Each Other? Education, Ethnicity and Trust in Turkey	Nil Polat
A Deep-Learning Approach to Brain Metastases Delineation	Allan Fong
Standing Balance Along the Medial-Lateral Direction	Paul Belzner

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Helping the Spinal Cord: Biomarkers of Acute Spinal Cord Injury

Presenter(s): Rishab Gupta

Abstract

Clinicians today identify standardized, baseline measures of spinal cord injury (SCI) severity by asking patients if they can feel sensation or move key muscles. By identifying the injury severity, treatment options can then be explored for acute SCI patients. However, clinical trials investigating these treatment options have not yet yielded convincing results, in part because of the challenges in recruiting and diagnosing research participants. Identifying biological markers that can act as an indicator of SCI severity in both the blood and cerebral spinal fluid (CSF) of patients would allow for a non-invasive aid in current assessment practices and work towards clinical validation of novel therapies for acute SCI. MicroRNA are small noncoding RNA molecules that function in the cell to control gene expression/protein production. The current body of literature suggest that MicroRNA orchestrate a wide range of biological processes such as inflammation, memory formation and cell death. In our previous study using a large animal pig model for SCI, MicroRNA showed strong differences in both type and quantity for SCI severity, in the serum of the injured animal. In this project, we looked towards replicating the study with human SCI patients using their CSF and serum samples. Using Next Generation Sequencing (NGS) technology to identify and quantitate MicroRNA levels, we found strong differences in their levels for different SCI severities. The analysis was done in parallel to our pig model because the characterization is important to establish if the biomarkers found in the pigs can be transferred to humans.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Association between Physical Activity Levels and Cardiovascular Risk Factors in Person Living with Type 1 Diabetes

Presenter(s): Alex Liu, Jennifer Lam

Abstract

For the general public, many studies have shown that physical activities can reduce the risks of cardiovascular diseases. Physical activities can significantly lessen the impact of disease risk factors and repair damaged cardiovascular tissues. However, similar reports in individuals with type 1 diabetes are scarce. This research aims to determine the correlation between the levels of physical activity and risk of cardiovascular diseases in patients with type 1 diabetes. Data regarding physical activity levels and cardiovascular risk factors were collected from patients' self-reported questionnaires and medical records. A total of 208 adults (≥ 18 years of age) with type 1 diabetes were included in the present analyses and stratified in three groups according their levels of physical activity (low, moderate, and high). We found an inverse association between physical activity and HbA1c, and weight (all $p < 0.001$). The Hemoglobin A1c test (HbA1c) ensures blood sugar levels are retained within range, through measuring one's average levels from a previous 2-3 month duration. On the other hand, differences in systolic or diastolic blood pressures, as well as levels of high hypoglycemia were reported to be undifferentiated among dissimilar physical activity level groups. Severe hypoglycemia did not differ in different groups either. Consequently, for individuals with type 1 diabetes, it is recommended that periodic physical activity should be performed, as physical activity is linked to favourable levels of glycemic control and weight management, which ultimately relates to risk reduction of cardiovascular disease.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Pong during Wake-a-Thon's - a Test for Vigilance Fluctuations due to Sleep Deprivation?

Presenter(s): Radi Khalili

Abstract

70 percent of college and university students sleep less than 8 hours per night. Sleep deprived students struggle more academically and are at higher risk for failing to meet required academic standards; student athletes are especially prone to sleep deprivation due to the added pressure of physical demands on regular basis, which may increase the likelihood of suffering injuries. Despite continuously promoting the traditional "good night's sleep" concept, students do not resonate to healthy sleep habits or even "sleep hygiene measures".

University and high school students at the Vancouver Summer Sleep School reviewed current knowledge dissemination concepts and agreed on investigating 'vigilance and performance' instead of 'sleep and benefits of sleeping' as a more attractive concept. They suggested and developed different "vigilance games" for a "Wake-a-Thon" (a 24 hour awake) event. Vigilance - the state of being alert and responsive to stimuli from the environment - may fit into the essential requirements of a 24/7- society. This summer, we plan to pilot "Wake-a-Thon" events where students will participate in "vigilance games" and monitor their own vigilance fluctuations by staying awake for 24 hours.

In this presentation, I focus on how sleep deprivation affects hand-eye coordination, a typical skill impacted, similar to alcohol intoxication, by sleep deprivation. "Pong", derived from "Beer Pong", may be an appealing game to use as a link to alcohol intoxication and communication of prevention measures. I will discuss this adapted game and review its usability as a "tool" for evaluating the impact of sleep-loss on vigilance-based performance.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Orbitofrontal interactions with the amygdala differentially influence efficient risk/reward decision-making

Presenter(s): Nicola Symonds

Abstract

Weighing the value of a reward against the likelihood of its delivery in order to optimize long-term gain is a fundamental component of adaptive decision-making. Both animal and human studies have implicated both the orbitofrontal cortex (mOFC) and the amygdala (BLA) in this form of cognition. Specifically in rats, inactivating either the mOFC or the BLA alone increases risky choice, raising the intriguing possibility that these two regions form a functional circuit that regulates efficient risk/reward decision-making. To address this, rats were well-trained on a probabilistic discounting task where they choose between a small, certain (1 pellet) and a large, uncertain (4 pellet) reward option, the odds for which decrease systematically across five blocks of trials (100% to 6.25%). An initial experiment used a chemogenetic approach to selectively inhibit neural activity within the mOFCBLA pathway. Disruption of this pathway increased risky choice in the later blocks of trials when it was no longer advantageous. This could reflect an inability to update or access the previously learnt value representation of the risky option as the odds of winning decreased across a session. In contrast, there was no effect among rats treated with a control virus. There remains a possibility that the opposing pathway projecting from the BLA to the mOFC is also involved in value-based decision-making, and results from this second experiment will also be discussed. Together, understanding how these complimentary pathways transmit information about risk/reward decision-making can provide insight into the neural circuitry underlying healthy and maladaptive choice behaviours.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: A review of the use of GIS in antibiotic resistance studies

Presenter(s): Tracy Wang

Abstract

Global antimicrobial resistance (AMR), especially antibiotic resistance, is reaching higher levels as new mechanisms of resistance are spreading between pathogens. Consequently, the rise of multi-drug resistant pathogens diminishes available treatments for both human and animal hosts diseases and infections. The use and misuse of antibiotics in medicine, agriculture and aquaculture promotes the rise of these mutational strains that acquired resistance largely due to horizontal gene transfers (HGT), specifically conjugation by the transfer of plasmids to other bacteria. HGT is influenced by the resistome -- ie. the collection of all antibiotic resistance genes -- in the microbial ecosystem. Recent studies found that resistomes are present in various environmental niches, such as soil and sewage water, and can impact the genetic expression of host pathogens. While geographic information systems (GIS) are an excellent tool to visualize and analyze ecological niches of a variety of macro- and microorganisms, it is currently underemployed in spatio-temporal assessments of antibiotic resistance. Previous spatial analyses have identified both geographic locations of high antibiotic resistance and impacts of variables such as human density and agricultural distance on AMR presence and levels. Additionally, the use of spatio-temporal analysis may provide insight on AMR resistance trends, the role of the environment on AMR evolution, effectiveness of interventions and predictive modeling for future AMR emergence. Results of the literature review are underway.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Improving Cardiorespiratory Fitness in Breast Cancer Survivors: The Breast Cancer and Physical Activity Level (BC-PAL) Trial

Presenter(s): Maya Liepert

Abstract

Regular physical activity (PA) participation can improve recovery and survival following a breast cancer diagnosis. Current guidelines focus on moderate-vigorous intensity PA participation (50-85% heart rate reserve; HRR). However, approximately 85% of breast cancer survivors do not meet PA guidelines and may prefer lighter-intensity PA (40-60% HRR). We assessed the effects of prescribing different PA intensities, compared to no additional PA, on cardiorespiratory fitness, anthropometry and body composition in breast cancer survivors. The Breast Cancer and Physical Activity Level (BC-PAL) Trial is a three-arm, 12-week randomized controlled trial. Forty-five inactive breast cancer survivors were randomized to one of three groups: no additional PA, 300 minutes/week of lighter-intensity PA (40-60% HRR) and 150 minutes/week of higher-intensity PA (60-89% HRR). Heart rate reserve is the difference between the resting heart rate and maximum heart rate. Cardiorespiratory fitness was assessed using VO₂peak, or the maximum rate of oxygen consumption during exercise of increasing intensity. VO₂peak, anthropometric measures and body composition were assessed at baseline and end of study. Participants in both PA groups received resources on PA, an activity tracker to record heart rate and PA time, and a diary to record PA goals, facilitators and barriers throughout the intervention. In-person/telephone meetings occurred every three weeks. Statistical differences in VO₂peak between groups were noted. Results indicate that improvements in cardiorespiratory fitness can be achieved with both higher- and lower-intensity PA in breast cancer survivors.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Intergenerational Educational Mobility over the Past Century in Canada

Presenter(s): Alex Chow

Abstract

Young adults born at the end of the 20th century find themselves in institutions of higher education at much higher rates than previous generations. While this trend gives the impression of improving social mobility, this could be deceiving because we would be conflating structural mobility with exchange mobility. We understand structural mobility here as upward mobility that results from educational expansion in the form of the post-war educational boom in Canada in the 1950s. On the other hand, exchange mobility refers to how one's social origins affects their social destinations, which focuses on the fairness rather than the structural expansion of the educational system, making it a better measure of what we understand as social mobility. Thus, this study examines exchange mobility in terms of intergenerational educational mobility (i.e. how parents' education affect their children's education) in Canada by investigating how, if at all, this relationship has changed over the past century. We use fifteen different cross-sectional surveys from the Canadian General Social Survey (GSS) to construct a longitudinal dataset covering birth cohorts across the 20th century. We conduct our analysis through a series of empirical models that include transition probability tables, odds ratios, and logistic regressions. We contribute to a growing gap in the Canadian literature since social mobility has been largely neglected by sociologists in recent years. Consistent with earlier sociological research, our findings show that despite the tremendous increase in higher education graduates, intergenerational educational mobility has been largely stagnant in Canada over the past century.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: ADD diagnostic app: exploring healthcare accessibility and innovation

Presenter(s): Giulio Pregolato, Kalen Forrester, Han Nguyen

Abstract

MINT, Multifaceted Innovation in NeuroTechnology, is an undergraduate amateur research group under the Biomedical Engineering Student Team. We explore affordable neuroscience by participating in annual design competitions, developing proof-of-concept devices, and build collaborations with all types of neuroscientists and neurohackers.

Our latest achievement is a proof-of-concept of an ADD diagnostic app that works with an off-the-shelf affordable EEG headset, the MUSE.

Currently, objective measurements of mental illness (such as EEG tests) only reach a predictive power of ~60% and are usually run only once. Consequently, diagnostic methods are subjective, which hampers research and access to treatment. Our hope was that an affordable EEG test could be run longitudinally and be more conclusive. To make it affordable, we designed it as an app that works in tandem with cheap off-the-shelf EEGs, in this case the MUSE, which retails for \$300.

The result is a gamified version of the Flanker task, which measures alpha suppression as a biomarker for functional connectivity, which is impaired in ADD/ADHD patients. The EEG signal is provided by the mUSE headset via bluetooth, and the app generates flanker tasks and records the intensity of alpha suppression over multiple tests.

Now, we happily believe the concept has been proven, but this is as far as we go. Clinical approval of the app is out of our scope, and even if it were, distribution would need a clinically approved EEG, which is not the case of the MUSE. Even though all the tools and knowledge necessary were easily available, this technology is far from ever being applied. Perhaps the quest of our generation is bringing to life what technology has made possible decades ago.

We are taking this project to the NeurotechX 2019 annual competition, then moving on to new impossible projects.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: How does drought impact plant performance and arbuscular mycorrhizal colonization on corn (*Zea mays*) and wheat (*Triticum aestivum*)?

Presenter(s): Melody Fu

Abstract

Most plants live in close relationship with many different species of soil organisms. Arbuscular mycorrhizal fungi (AMF) are known to form mutualistic symbiotic associations with diverse plant species including the major cultivated crops. AMF exchange sugar for nutrients in association with plant roots, and may play a key role in sustainable agriculture under climate change. Increasing AMF colonization under drought conditions can enhance, or have little to no impacts, on crop production depending on the context. To address this ambiguity, I studied the effects of experimental drought on plant performance and arbuscular mycorrhizal colonization with two major grass crops in Canada - corn (*Zea mays*) and wheat (*Triticum aestivum*). Two-week old seedlings, inoculated with or without arbuscular mycorrhizae, were subjected to a week of moderate drought stress. I measured shoot parameters (ie. net photosynthesis rate, transpiration rate, leaf biomass) as well as root parameters (ie. root surface area, arbuscular mycorrhizae colonization rate) to evaluate the overall plant performance. I predict that plants colonized by AMF will have improved performance, and with a higher increase in wheat because it is less adapted to drought compared to corn. British Columbia is projected to have longer summer droughts by 2050, and the information in my research can be used to develop more sustainable ways of farming to mitigate impacts of climate change.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: X-ray Crystal Structure Reveals O-Acetylpeptidoglycan Esterase (Ape1) as a Potential Target for Drug Design Against Bacterial-Induced Gastroenteritis

Presenter(s): Ian Yen

Abstract

Campylobacter jejuni is a pathogenic bacterium that adopts a helical cell shape to burrow through the mucosal layers of the gastrointestinal tract to cause disease. It resides in the guts of chicken as commensals, but humans develop severe gastroenteritis upon consumption of contaminated poultry. Current hospitalization costs amount to almost \$1 billion in annual economic losses, a financial burden most prevalent in developed nations. The bacterium is protected by the cell wall, a macromolecular structure composed of polymeric sugar units linked to peptide stems, collectively known as the peptidoglycan (PG). O-acetylpeptidoglycan esterase (Ape1) is a cell wall enzyme capable of chemically modifying the PG structure and has recently been implicated as an essential virulence factor in disease manifestation, serving as an appropriate inhibitory target. However, the protein structure of Ape1 remains uncharacterized, hindering inhibitor design and development. To determine structure, an X-ray crystallographic approach was utilized. Subsequent X-ray diffraction of an Ape1 protein crystal to high resolution led to the generation of an atomic model. The structure revealed a monomeric protein comprised of two domains: a C-terminal catalytic domain housing the SHD catalytic triad and an N-terminal putative carbohydrate binding module. We hypothesize that the latter domain is involved in the recognition and subsequent binding of its PG substrate. Hence, an inhibitor targeting this domain will likely abolish Ape1's substrate recognition ability and function. Elucidating this enzyme structure provides much needed molecular details for the design of high affinity inhibitors for use in developing new treatment strategies against disease.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The role of Isocitrate dehydrogenase (IDH) epigenetic mutation in Glioblastoma Malignant Transformation

Presenter(s): Asana Khajavi, Negin Askari-Bayazi, Tavleen Kaur Ramgarhia

Abstract

Glioblastoma (GBM), is a tumor arising from the brain. It is a high-grade cancer, which means it is aggressive and associated with a dismal survival rate. In fact, it has a 5-year survival rate of under 10%- the worst survival rate of all brain cancers. GBM can be segregated clinically into two classes: primary GMB which can arise as a new mutation; and secondary GBM which arises following malignant transformation of a pre-existing low-grade brain tumor. Mutations in Isocitrate dehydrogenase (IDH), a catalytic enzyme, have been identified in roughly 10% of glioblastomas and is most commonly associated with secondary glioblastomas. The role IDH mutation plays and its effect on the epigenome during the process of malignant transformation from a low grade glioma to a GBM remains unclear. This proposed research aims to investigate and understand the epigenomic changes that occur during malignant transformation of IDH mutant gliomas to secondary GBM by using epigenomic approaches.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: A microscopic story of evolution, cooperation and enslavement.

Presenter(s): Mitch Syberg-Olsen

Abstract

Endosymbiosis refers to a relationship between two organisms, where one organism lives inside the other. A vast diversity of familiar organisms such as soybeans, corals, worms and insects, upon inspection at the cellular level, can be found to be hosting microbial endosymbionts. Many of these symbiotic partnerships are essential, meaning that the host and symbiont (hosted) depend on each other for survival.

Our story is centered around Euplotes, a type of microbe which hosts essential bacterial endosymbionts. The longstanding perception of Euplotes was that it had acquired and maintained a single endosymbiont, Polynucleobacter, through evolutionary time. However, recent advances in understanding have changed the narrative from a harmonious coexistence to that of microbial enslavement. Rather than having picked up Polynucleobacter once, Euplotes has repeatedly taken up free-living Polynucleobacter from the environment, only to discard the old symbionts which have been degraded by the chaotic forces of evolution. Additionally, symbionts other than Polynucleobacter have recently been observed in Euplotes, which add to the complex evolutionary narrative.

Our project used state-of-the-art genome sequencing technology and various computational analyses to characterize and make evolutionary inferences about two newly described Euplotes symbionts. Genomic analyses reveal the evolutionary age and functional capabilities of these new endosymbionts, helping to clarify our understanding of the origin and dynamics of symbiosis in Euplotes.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Links Between High-Arousal Positive Affect, Perceived Partner Closeness, and Physical Activity in the Everyday Life of Stroke Survivors and their Partners

Presenter(s): Izzie Fortuna

Abstract

Stroke is the third leading cause of death in Canada and one of the main causes of adult disability. There is increasing need for researchers to investigate factors that can be targeted to reduce stroke risk for stroke survivors and individuals who have never had a stroke. Physical activity is one modifiable behaviour, but many older adults have high levels of inactivity. Studies also suggest that high-arousal positive affect and social support from significant others may serve as motivating factors to exercise. However, there is limited stroke-specific research on the relationship between these behaviours. This study aimed to investigate the interaction between high-arousal positive affect and perceived partner closeness on the physical activity of stroke survivors and their partners. Participants completed a 2-week ambulatory assessment, in which they answered daily surveys rating their affect and partner interactions, and wore accelerometers to measure step count. Results suggest higher ratings of high-arousal positive affect were significantly correlated with higher step count. Closeness was not significantly correlated with step count. However, there was an interaction between high-arousal positive affect and closeness on step count. On days when individuals reported low closeness, greater high-arousal positive affect was related to greater step count. These findings support research on the relationship between high-arousal positive affect and physical activity, and applies it to stroke survivors. Increasing high-arousal positive affect to increase physical activity may be most beneficial for couples with low perceived closeness. This study can inform future interventions, however research is required to determine causal effects.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Cardiovascular Health Benefits of Exercise Training in Persons Living with Type 1 Diabetes

Presenter(s): Jacklyn Ku

Abstract

The relationship between exercise training and cardiovascular risk factors has been investigated extensively in type 2 diabetes; however, less is known about this relationship in persons living with type 1 diabetes, (T1D). The aim of this study was to conduct a systematic review and meta-analysis of published clinical randomized, controlled trials on exercise training for cardiovascular risk factors in T1D. Methods: Electronic databases were systematically searched and key reviews cross-referenced to identify articles for inclusion. Both randomized and non-randomized controlled trials reporting associations for exercise-training and cardiovascular risk factors in T1D were included. Weighted mean differences (WMD) of each cardiovascular risk factor between exercise groups and control groups were calculated using a random effect model. Subgroup analyses were performed using the following variables, age, exercise frequency, type of exercise, and program duration to explore sources of heterogeneity. Results: A total of 24 studies reported the effects of exercise training on cardiovascular disease risk factors. Exercise-training increased VO₂max and reduced glycated hemoglobin, daily insulin dosage, and total cholesterol. Subgroup analyses showed greater beneficial effects in higher volume (frequency per week and/or duration) exercise interventions. Exercise training did not lead to consistent changes in body mass index, blood pressure, triglycerides, HDL-C, or LDL-C. Conclusions: In persons living with Type 1 diabetes, aerobic exercise training is associated with a beneficial cardiovascular profile, such as lower total cholesterol, daily insulin dosage and with better glycemic control and aerobic fitness

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Does economic inequality increase the consumption of status goods?

Presenter(s): Shali Tayebi

Abstract

Past research suggests that higher levels of inequality are associated with increased status anxiety - one's concern about one's relative standing in society. One aspect of heightened status anxiety is an increase in the consumption of goods that signal status to others. However, most of the research testing this relationship has used correlational methods and compared inequality indices and consumption behaviour across different countries. To test whether this link is causal, we are conducting an experiment where American participants recruited from Amazon Mechanical Turk, which is a crowdsourcing marketplace that allows individuals to perform tasks virtually, are asked to imagine moving to a new society, called "Bimboola". Participants are randomly assigned to either a highly unequal or relatively more equal society and are provided with an annual income within that society. Crucially, across the two conditions, all participants are given the same income. Then participants are asked to spend some of their money and to choose between products that vary in status and price. In addition, they can set remaining money aside for savings, insurance, and basic necessities. The hypothesis is that participants in the unequal condition allocate more of their money to goods that signal status.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Assessing Student Knowledge and Usage of Cannabis at a University: A Knowledge, Attitude, Practice Study

Presenter(s): Sophie Harasymchuk, Dilpreet Bharaj, Tanner Jones

Abstract

On October 17th, 2018, Canada became the second country to legalize cannabis under the Cannabis Act, allowing the production, sale, distribution, and possession of the substance albeit under a tight framework (Government of Canada, 2019). Data collected in 2012 reported that 47.2% of males and 42.3% of females aged 15-24 in Canada had ever consumed cannabis (Statistics Canada, 2018). Moreover, data from 41 Canadian post-secondary institutions indicate that 41.6% of students had ever used cannabis, 15.4% had used cannabis in the past month, and 2.5% were daily cannabis users (Statistics Canada, 2018). Considering the potential increase in cannabis use initiation among post-secondary students in the post-legalization era, we aim to conduct a cross-sectional cannabis knowledge, attitude, and practice (KAP) survey among students at the University of British Columbia (UBC) to gain a better understanding of the dynamics of cannabis use among them.

We would administer an anonymous pilot-tested self-administered online KAP survey to a random sample of 18-24 year-old UBC students (via UBC's emailing list). The survey would collect data on cannabis usage and frequency as well as knowledge and attitudes towards cannabis-related potential harms and benefits. Data will be presented as relative frequencies and 95% confidence intervals (CI) for categorical variables and means with 95% CI for quantitative variables. Students' knowledge, attitude, and behaviors in different age groups and genders will be compared using chi-square tests. Analyses will be completed using Stata v.15 software and p-values <5% will be considered as statistically significant.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Building Expressive Data Visualizations for Communicable Disease Outbreak Investigations

Presenter(s): Shannah Fisher

Abstract

Investigations of disease outbreaks are being better supported by advances in technology that help public health agencies collect and analyze increasing amounts of complex data, including genomic data. Alongside the growth of data, there has also been greater demand for visualization tools that help to explore data and communicate findings. A previous study was conducted to better understand how public health analysts visualized genomic and epidemiological data and developed a Genomic Epidemiology Visualization Typology (GEViT). The GEViT study identified current practices as well as gaps that current data visualization systems do not address. We used the findings from GEViT to implement a software architecture called gevitR, that aims to help public health analysts easily generate complex data visualizations for exploring their data and communicating their findings. The key innovation of gevitR is that it allows analysts to quickly generate so-called “static linked views” that shows the data through very specific combinations of multiple single charts. Using available public health datasets, we compared gevitR against existing tools by evaluating its ease-of-use, expressivity, and the ability to link to relevant data analysis methods. Our analysis confirmed that gevitR addresses many of the unmet needs that current data visualization tools do not. We have implemented gevitR in the R programming language and it is freely available for any to use. As climate change and human activity impact the frequency and nature of disease outbreaks, the availability and usefulness of data visualization tools will become important for understanding and controlling outbreaks.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: A review of the Forest Rights Act in India as it concerns aspects of Adivasi life and identity

Presenter(s): Rayan Moodad, Pulkit Aggarwal, Nikki Rao

Abstract

Forest management policies that address the community equity discourses are beginning to transform into a tangible reality all across the globe. It is especially significant when these policies have a direct and targeted effect on the marginalized communities such as a nations respective Indigenous peoples. This study highlights how the Scheduled Tribes (commonly known as Adivasis) are represented within the recent Forest Rights Act (FRA) 2006 of India. Through a keyword review and analysis of the original policy document FRA 2006, we identified three themes - accessibility of forest resources, local political power dynamics, and disruption of traditional lifestyle that impacted Adivasi life. Further, we conducted a review of supporting literature on the aforementioned themes to provide insights into why these identified themes are relevant for Adivasis. The overall aim of this research is to initiate a productive and progressive discussion that acknowledges the social and political power imbalances, and to potentially encourage measures that might be useful for future forest policies and biodiversity conservation programs to be more inclusive of local communities.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Adolescent Cancer Patient Referral and Driving Time in BC

Presenter(s): Avril Li

Abstract

On average, 412 adolescents in Canada are diagnosed with cancer while only 30% are treated at specialized pediatrics centre. There are many advantages of being treated at pediatrics centres since they have more capacity to support the social and emotional needs of children and teens. In particular, travel time is an important barrier that affects cancer treatment and locations. Since there is only one pediatric oncology centre in BC, this study investigates whether referrals to pediatric or adult cancer treatment centre are influenced by driving time for patients between the age of 15 to 18 from 1995 to 2010 in BC. We predict that there will be a threshold distance at which patients will be more likely to be treated in their closest cancer centre, regardless of their age and diagnosis. In addition, younger, higher socioeconomic, lymphoma and sarcoma, non-rural patients, patients without radiotherapy, not travelling in winter, and farther from an adult cancer centre will be more likely to be referred to pediatric centre. The adolescent patient data was extracted from the Childhood, Adolescent, and Young Adult Cancer Survivors Research Program of British Columbia (CAYACS) while the driving time analysis was performed on ESRI ArcGIS 10.6.1, a mapping analytics platform. The driving time outputs will be displayed as maps. Odds ratio between each modifier and referral centres will be computed on R 3.5.1 using univariate and multivariate logistic regression. This project belongs to the CAYACS health services aim of determining quality of care and modifiers.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Not Trusting The State, Not Trusting Each Other? Education, Ethnicity and Trust in Turkey

Presenter(s): Nil Polat

Abstract

The relationship between social trust and political trust has been a considerable debate. Social trust refers to belief in the honesty, integrity and reliability of others. Political trust indicates trust to political institutions and government. In this study, we investigate how education affects people's social and political trust among Turks and Kurds. Our analyses of the data from ISSP 2014 (International Social Survey Programme) show that education has a stronger and negative impact on people's political trust among turks than among kurds. Among Turks, there is a inverse relationship between the level of education and political trust in the population. Turks who have less political trust tend to have less social trust . Among Kurds education has not significant negative impact on their political trust which explain why the effect of education remains positive on their social trust. The effect of the education as well as social and political trust demonstrate that low political trust also lead to low trust in people.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: A Deep-Learning Approach to Brain Metastases Delineation

Presenter(s): Allan Fong

Abstract

MOTIVATION: Current radiotherapy workflow is, in part, bottlenecked by the outlining of gross tumour volumes (GTVs). This process is called manual delineation. Not only is this process time-consuming, but there is well-documented inter-observer variability. GTVs are the basis for forming an optimal treatment plan, and their accuracy directly affect clinical outcomes. With recent developments in machine learning, we sought to explore the possibility of using deep-learning models (DLMs) to automate the delineation process.

BACKGROUND: We trained three DLMs to delineate GTVs for brain metastases cases. The BC Cancer Agency provided 78 retrospective cases to train the first DLM and 28 similar cases to be used as the validation set. Public databases provided 170 retrospective cases for training our second DLM. The combined 248 cases trained our third DLM.

METHODS: Geometric and dosimetric variations between the DL-derived GTVs and retrospective clinical GTVs were used to evaluate the DLMs. Hausdorff distance and DICE coefficients were used to quantify geometric differences. Dosimetric consequences were quantified by dose-volume histograms.

RESULTS: Paired geometric and dosimetric analysis will reveal whether or not the DLMs have the potential for clinical implementation. By comparing our three models' performances, we will investigate the question of over-biasing and the associated value of combined training sets. This will provide particularly useful insights into the ability of a DLM to be shared across different treatment centers with varying patient cohorts.

WAVE 1 | ORAL PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Standing Balance Along the Medial-Lateral Direction

Presenter(s): Paul Belzner

Abstract

The kinematics of anterior-posterior (AP) standing balance of humans can be represented as an inverted pendulum. In this simplified model, a single point mass represents the whole body and the ankle joint represents the pivot point. The inverted pendulum model of standing balance has a wide range of applications in experimental and clinical research, in part due to its unique degree of freedom. The purpose of our research is to gain a further understanding of human standing balance along the medial-lateral (ML) direction. Describing the kinematics of ML motion for standing balance appears more complicated than AP motion, based on the anatomy of the lower body. Considering the two legs and the torso, we can construct a model of ML standing balance with 5 degrees of freedom. The goal of our study was to simplify this model using the inverted pendulum approach from AP motion. We explored two main modeling approaches: 1) assuming that the change in angle between the torso and hips is negligible and 2) approximating the ankle and hip joints as a four-bar linkage, with the feet as the two constraints. The four-bar linkage provides angular constraints such that all four angles can be represented as a function of a single angle, thus reducing the degrees of freedom from 4 to 1. These results show that ML motion can be modelled as an inverted pendulum, which can be implemented into applications including a robotic machine that can be used for future research purposes.

WAVE 1 | POSTER PRESENTATIONS

LIST | 10:00AM - 11:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

THEME: HEALTH AND WELLNESS

WELTEL TB OUTREACH: Piloting a Mobile Health Intervention for Provincial Tuberculosis Services	Katie Gourlay
Dairy Cow Preference for an Outdoor Open Pack	Genevieve Scullion
The effects of paced mating on female laboratory rat affective state	Lexis Ly
The influence of an outdoor open-pack on estrus behaviour in dairy cows	Kathryn McLellan
Diagnostic and Prognostic Implications of Peak Leukocyte Count in the Intensive Care Unit	Nafeesa Fazel
Health factors related to male dairy calf morbidity following long-distance transport to calf growing facilities	Daniela Solis
Patterns of inheritance of deep infiltrating endometriosis: A retrospective study	Preksha Goenka Hannah Martin
Investigation of the OPRM1 promoter DNA methylation profile in rats with opioid-use disorder	Maria Vas
Spatial patterns of BOLD signal activation useful for identification and classification of task-state functional brain networks	Caleb Ritchie
The CanTBI Study: The creation of a national database and biobank for traumatic brain injuries	Louise Meddings Sim Pattar

The Function and Abnormal Expression of TGF-beta in COPD

Danica Shannon
Gura Gill
Nima Tussy
Mitchell Prost

Effect of Resveratrol Supplementation on Oxidative Stress Levels in Women with Polycystic Ovarian Syndrome (PCOS)

Wania Khan
Sabrina Sandhu

How does mechanical signalling regulate mammalian heart tissue regeneration post infarction?

Mohammad Khamseh
Marissa Foo
Alessandra Luongo
Joey He
Kevin Le

HDACi affect on Clinical Treatments, Genome Instability as well as Genome Toxicity

Crystal Chu

Retinal Dopamine Receptor Knockout and Myopia in Chicks

Petar Koncarevic
Randi Shen
Sophie Carriere

The Effect of Platelet-activating Factor on Tissue Specific Mast Cells

Amy Wang
Isabella Factor
James Sousa
Lucy Li

A Sub-study of CAN-TBI: the creation of a national database and Biobank for traumatic brain injuries

Martina Knappett
Victoria Purcell

THEME: INDIVIDUAL AND SOCIETY

Doomed to Cooperate: Canada and Russia's Arctic Relations in the Context of the Crimean Crisis

Alexandra Slobodov

Effect of Smoking History on the Perceived Harm of Electronic Cigarettes versus Conventional Cigarettes

Kimia Ziafat
Amy Wang

Head and Eye Movements While Walking

Asya Aksoy
Payton Kufeldt
Lea Farah
Ethan Yeung

Campus Community Participation in Undergraduate Students at UBC
Vancouver

Joe Stieb

How can different uses of clickers in post-secondary classrooms impact self-regulated learning

Annabella Feeny
Yasemin Ozcitak

What are the factors affecting uptake of cervical cancer screening among women of reproductive age in Sierra Leone?

Monique Sandhu
Waris Bhatia
Sia Jan-abu

Majority Minority Descriptive Norms and Their Influence on Injunctive Norm Perceptions

William Zheng
Nakul Gupta
Jane Min

Cognitive Language Processing of Mandarin Words

Marcus Lo
Kari Li

The World is Fair, Even if I Suffer: Meaning in Life and Just World Beliefs Function in Chronic Pain Patients

Ashley Lee

THEME: INNOVATION AND TECHNOLOGY

A comparative study of two MRI techniques: myelin water fraction (MWF) and inhomogeneous magnetization transfer ratio (ihMTR) used to confirm the effect of temperature on myelin signal detection in white matter.

Rozhin Ressideh
Ravneet Tiwana
Arielle Hulsman
Prableen Sandhu
Abesan Rasan

Using sensors for falls prevention in dementia care: A systematic review

Litsa Rethimiotakis
Yihan Xia
Claire Tiberghien
Crystie Situ

Recovering Information Lost in a Black Hole: Exploring A Geometric Equivalent to the Kitaev-Yoshida Algorithm	Ben Holmes Amrit Guha Anusika Nijher
Impact of "Playpens" on Laboratory Rat Welfare	Nisha Raghukumar
Designing a smart control system for quadrotor	Ranky Lau Daniel Wang Manu Koipallil
Effect of Surfactant on Sorting of Bidispersed Colloidal Particles from Evaporation of a Sessile Droplet	Ivy Shi
Automated alignment and segmentation of brain images using machine learning	Debon Lee Maxwell Wang Sue Baek Lydia Li Noor Brar
The effectiveness of applying neural ordinary differential equations on domains of path finding in simple robotic arm	Juho Pyo Matthew Tang Hyehwa Lee

THEME: SUSTAINABILITY AND CONSERVATION

Investigation of Potential Contaminants at Salish Creek	Gurvir Dhutt Steven Dang
Hungry, Hungry Oysters: The effects of cornmeal as a feed substitute on growth in <i>Crassostrea gigas</i>	Alessandra Gentile Jordyn Shaw
Effects of increased soil water content on the composition of Douglas-fir root fungal communities	Tom Howey Eully Ao Qiuning Lyu Chris Hou Hou Ralph Uy Yvonn De Las Alas

Methylmercury in Pilot Whales

Brian Low
Leo Zhao

Endophytic Microbial Communities and Viruses Associated with the Lodgepole
Pine in Forests of British Columbia

Jack Cheng
Paul Tang
Savanna Skinner

Continuous Study: A population study on Chinook Salmon (*Oncorhynchus
tshawytscha*) in the Capilano River Hatchery

Robert Hechler
Isaac Clark

Species co-occurrence patterns between hummingbirds and flower mites in
Peru

Macgregor Aubertin-
Young

The Use of Chitosan in Modified Soil to Remove Harmful Marine Algal Blooms

Breyanne Bautista
Rachael Kim
Katie Donohoe
Evan Broderick

Finding an Optimized Solution for Acid Rock Drainage in Large-Scale Mines

Andrew Cleghorn

Robyn Sahota

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: WELTEL TB OUTREACH: Piloting a Mobile Health Intervention for Provincial Tuberculosis Services

Presenter(s): Katie Gourlay

Abstract

BACKGROUND: Directly Observed Therapy for individuals living with tuberculosis (TB) is a proposed standard of care, however high resource demands from health care systems prevent adherence. We examined a mobile health (mHealth) intervention as a low-cost alternative to observed therapy for patients in between clinical appointments.

INTERVENTION: WelTel is a centralized, secure, web-based digital health platform allowing communication between healthcare providers and clients via text messaging, phone, or video. WelTel was introduced to the BC TB Outreach program to centralize communication with enrolled patients, who received regular text-message check-ins; correspondence history and notes made by healthcare providers were accessible to other providers on the platform. Only SMS and phone calls were used in this pilot. Focus groups were held with outreach workers and nurses to qualitatively assess the feasibility, acceptability and transferability of the platform. **RESULTS:** The program succeeded in replacing existing individual provider-to-client messaging practices. Early assessment revealed perceived improvements in continuity of care and communication between patients and clinicians. Key thematic findings were improved interactivity and support for patients as the program progressed. However, concerns surrounding language differences and clinical integration challenged implementation. Variability in uptake between outreach teams limited universal acceptability, suggesting a need for ongoing provider training.

CONCLUSIONS: Digital health technology has potential to enhance tuberculosis services through improving patient care continuity and enhancing management of healthcare resources. We propose a future pilot of mobile video DOT for TB patients requiring more intensive support and monitoring.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Dairy Cow Preference for an Outdoor Open Pack

Presenter(s): Genevieve Scullion

Abstract

Canadian and US citizens value pasture access for dairy cows. When offered free access to pasture, cows spend the majority of the day indoors, but spend 90% of the night on pasture. However, access to pasture is not always feasible. For example, some farms lack adequate space to provide cows pasture access, and periods of rainfall cause pasture to become muddy. Hence, alternative outdoor areas that require less space and have good drainage are needed. We investigated 1) the preference of Holstein cows for an indoor free-stall barn versus an outdoor deep-bedded open pack and 2) if the preference for the outdoor pack was influenced by time of day as well as by rainfall. 18 cows were given free-choice access to an outdoor open pack for 12 weeks. Location of the cows (i.e. in the free-stall barn or on the outdoor open pack) was continuously recorded with video cameras. Hourly rainfall data was obtained from Agriculture and Agri-foods Canada in Agassiz, B.C. Two one-week periods (November 21-27 and December 7-13) of video data were analyzed. Results show that the number of cows outside on the pack nearly doubled between 18:00h to 04:00h, versus during the day (04:00h to 18:00h). Additionally, the majority of cows preferred to be indoors during periods of rain. Our results indicate that free-stall housed cows prefer to have periods of outdoor access to an open-pack, and that rainfall and time of day play a role in this preference. Thus, farmers should consider access to outdoors accordingly.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The effects of paced mating on female laboratory rat affective state

Presenter(s): Lexis Ly

Abstract

Studies of the wild Norway rat (*Rattus norvegicus*) show that females take an active role during mating by controlling the pace of copulation through approach and withdrawal. Laboratory breeding cage size prevents females from 'pacing' due to the lack of space for the female to retreat. Instead, the temporal control is given to the male—'unpaced' mating. Unpaced mating has shown to have adverse effects on female sexual reward and motivation; however, there is no literature that evaluates the effect of paced and unpaced mating on the welfare of female rats. In the present study, we test the prediction that the addition of a partition for females to get away in a standard laboratory cage will improve affective state and anxiety. Female rats were bred in either a standard laboratory cage, or a cage with an added partition with a hole large enough for only a female rat to enter and exit. Affective state was measured through anticipatory behaviour and elevated plus maze tests throughout 10 days with the male in the breeding cage. Expected results are that females housed in the partitioned cage will use the getaway as a means to pace copulation, show stronger anticipatory response and spend less time in the open arms of the elevated plus maze. The addition of an apparatus to pace mating is a possible refinement for future breeding females by improving their affective state and reducing anxiety, and allowing for the natural behaviour of approach and withdrawal.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The influence of an outdoor open-pack on estrus behaviour in dairy cows

Presenter(s): Kathryn McLellan

Abstract

Expression of mounting behaviours are important for the detection of estrus and the successful reproduction of dairy cows. Previous research indicates that access to pasture facilitates estrus expression in dairy cows. However, pasture is not always feasible on farms due to space requirements. Determining if alternative outdoor environments that require less space, such as an outdoor open-pack of wood shavings, can benefit the expression of estrus behaviours is important to improve reproductive success of dairy operations and cow welfare. The primary aim of this study was to determine the effect of access to an outdoor open-pack on the expression of estrus behaviour in dairy cows. Thirty-six Holstein cows were housed in a free-stall barn and randomly assigned to one of two treatments: indoor cows had no access to an outdoor open-pack and outdoor cows had access to an outdoor open-pack from the free-stall barn via an electronic gate. Continuous video recordings were used to analyze the frequency and location of various mounting behaviours of cows in both treatments during each cow's estrus periods over a duration of 12 weeks. Preliminary results indicate no effect of access to an outdoor open-pack on the number of mounts performed per hour (mean + SE) indoors (0.6 + 0.3) versus outdoors (0.7 + 0.3). Further analysis investigating the effect of time spent indoors and outdoors on mounting behaviours is required to better understand if an outdoor open-pack benefits estrus expression in dairy cows.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Diagnostic and Prognostic Implications of Peak Leukocyte Count in the Intensive Care Unit

Presenter(s): Nafeesa Fazel

Abstract

Leukocytosis, an increase in number of white blood cells, is a known predictor of infection and inflammation; leukopenia is an established marker of immunocompromise. The degree of leukocytosis, however, may provide additional information to clinicians treating critically ill patients. Our primary aim was to determine the most commonly encountered diagnoses in patients with different peak leukocyte counts. Our secondary analyses were to determine the length of stay and mortality associated with peak leukocyte count across diagnoses and determine, using multiple logistic regression, whether peak leukocyte count was more predictive of mortality than other diagnostic and demographic variables. There were 45,340 patients in our cohort. The rate of *Clostridium difficile*, intestinal bacteria that cause infectious diarrhea, was substantially higher in patients with extreme leukocytosis (peak leukocyte $\geq 40,000$; 12% compared to 1-2% in all other groups, $p < 0.001$). In our multivariate regression, extreme leukocytosis was associated with very high mortality rates (adjusted odds ratio 10.4, 95% CI: 8.5-12.7, $p < 0.001$). Degree of peak leukocytosis in critically ill patients provides valuable diagnostic and prognostic information. Having an understanding of the conditions associated with each category of peak WBC count can help clinicians in caring for patients in the intensive care unit. In particular, extreme leukocytosis signals a very high risk of mortality and may indicate the need for more aggressive or urgent intervention.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Health factors related to male dairy calf morbidity following long-distance transport to calf growing facilities

Presenter(s): Daniela Solis

Abstract

Many male dairy calves are sold when they are less than two weeks old and undergo long- distance transport to calf rearing facilities where they face high morbidity and mortality rates. The most common calf diseases are bovine respiratory disease (BRD) and neonatal calf diarrhea (NCD). The objective of this study was to identify which health factors measured at the dairy farm of origin related to treatment for BRD and NCD during the first two weeks at calf grower operations. Age, heart girth circumference, serum total protein (STP), navel and attitude scores were recorded for 374 male Holstein calves from 11 BC dairy farms using the Calf Health Scorer app before being shipped to one of two calf growing operations in Western Canada. All treatments for BRD and NCD, and mortality for any reason were recorded during the first four weeks after calf arrival. Mixed logistic regression was used to assess which pre-transport calf measurements were associated with mortality or disease treatment. An overall mortality rate of 6.1% was observed during the duration of the study. Between both calf grower locations, 23% of calves were treated for NCD, while 44% were treated for BRD at least once during the first two weeks. Low STP levels were identified in 14.6% of calves. Calves with smaller heart girth circumferences ($P=0.04$) and poor navel scores ($P=0.02$) had increased risk for treatment for NCD. Calves with poor attitude scores had increased likelihood of dying ($P=0.002$). Calf health and size are important for fitness for transport.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Patterns of inheritance of deep infiltrating endometriosis: A retrospective study

Presenter(s): Preksha Goenka, Hannah Martin

Abstract

Endometriosis is where tissue from the uterine cavity becomes implanted in the abdominal cavity. Deep infiltrating endometriosis is a form that penetrates more than 5mm below the peritoneal surface. It is strongly correlated with symptoms of severe pelvic pain and infertility. Approximately 10% of all women have endometriosis and women with a family history of the disease are 4 to 8 times more likely to develop it. In this study, it is hypothesized that deep infiltrating endometriosis is inherited as a monogenic trait.

A retrospective study was conducted by analyzing the pedigrees of two generations of twenty families recruited from various clinics across Canada. Eligible families had to have at least one woman with a histopathological diagnosis of endometriosis. Prevalence of endometriosis was determined and families were divided into two groups: more than one women with endometriosis or only one woman with endometriosis.

Familial aggregation of deep infiltrating endometriosis in these families supports the hypothesis that deep infiltrating endometriosis is heritable. This study highlights the importance of women with familial history of endometriosis to be aware of their vulnerability to this disease and recognize symptoms. It also demonstrates that further studies determining the exact mechanism of inheritance are essential for better treatment of this disease.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Investigation of the OPRM1 promoter DNA methylation profile in rats with opioid-use disorder

Presenter(s): Maria Vas

Abstract

Canada is currently in the midst of a dire opioid crisis. According to a National report released September 2018 by the Special Advisory Committee on the Epidemic of Opioid Overdoses, there have been over 8000 opioid-related deaths in Canada between January 2016 and March 2018, with 1473 of these deaths occurring in BC alone in 2017. It has been proposed that epigenetic modifications can underlie substance use disorder predisposition, dependence, tolerance, and relapse. Mu-opioid receptor 1 (OPRM1) functions in pain and mood responses, as well as in reward-seeking and addictive behaviours. Genes can be regulated through DNA methylation, a heritable epigenetic modification, in which a methyl group is added to the C-5 position of cytosine in DNA. C-5 methylation of a cytosine occurs in regions of DNA where the cytosine (C) nucleotide is followed by a guanine (G) nucleotide, known as CpG sites. CpG sites are underrepresented in the genome, and tend to be located in gene promoter regions. Increased DNA methylation at CpG sites within the promoter regions of genes is known as hypermethylation, and is generally associated with gene silencing. Hypermethylation at the -18, +84 and +126 CpG sites within the OPRM1 gene promoter has been observed in rodents and humans with opioid use disorder. Despite this evidence, there has been no previous investigation of whether chronic opioid use is sufficient to induce hypermethylation within the OPRM1 promoter region. This experiment proposes to bridge this gap in the knowledge by inducing heroin use disorder in rats using an intravenous self-administration protocol. Once addiction has been established, brain tissue DNA extracted from heroin dependent and drug-naive rats will be subjected to bisulfite sequencing to assess the OPRM1 DNA methylation profile. I hypothesize that heroin-use disorder in rats is sufficient to induce DNA hypermethylation at the -18, +84, and +126 CpG sites within the OPRM1 promoter. The results of the proposed experiment will advance understanding within the field on the effects of DNA methylation on addiction, and potentially provide further insight into the complexities and mechanisms underlying opioid use disorders.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Spatial patterns of BOLD signal activation useful for identification and classification of task-state functional brain networks

Presenter(s): Caleb Ritchie

Abstract

Functional magnetic resonance imaging (fMRI) has revealed that the human brain is organized into networks of spatially distributed areas which activate and deactivate in unison. Resting-state fMRI analyzes individuals in a mind-wandering state and has revealed seven non-overlapping networks some of which have been labelled for function based on brain region. Currently, the relationship of resting-state networks with the task-state brain is not widely understood, nor is the extent to which resting-state network labels represent function. Using carefully coordinated tasks, our lab is able to infer function by observing the magnitude and timing of activity for a given network between different task conditions. Previous studies show that there is a consistent set of task-state networks that can be extracted using constrained principle component analysis (CPCA) which can be classified into categories based on cognitive function. This study reinforces the idea that task-state reveals networks may not be well explained by the resting-state paradigm and contributes to the simplification of network classification. The goal of this study was to identify the extent to which patterns of spatial activity can be distilled into reliable principles of identification for networks revealed by task-state fMRI-CPCA. Methods relied on manually sorting through images thought to represent each network in order to observe key brain regions that show reliable patterns. Novel techniques were used to enhance the visualization of such patterns. Main findings reveal 3-4 brain regions which differ predictably between networks including the cingulate cortex, supplemental motor area, superior parietal cortex, and the insular cortex.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The CanTBI Study: The creation of a national database and biobank for traumatic brain injuries

Presenter(s): Louise Meddings, Sim Pattar

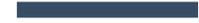
Abstract

The effects of a traumatic brain injury (TBI) often manifest in a multitude of somatic, cognitive and psychological symptoms. Current diagnostic and prognostic procedures rely on crude classification instruments and algorithms that have limited classification and predictive ability. This multi-centre longitudinal study is recruiting 450 pediatric and adult patients from seven hospitals across Canada to create a national database and biobank for traumatic brain injuries. This is the largest TBI trial in Canada. The aims are to integrate large scale clinical, imaging, and biospecimen data to refine diagnostic and prognostic ability in TBI, examine the socioeconomic impact of TBI in Canada and to inform future interventional trials in TBI. We are currently recruiting participants from the Emergency Department, trauma wards and ICU at Vancouver General Hospital, along with the Emergency Department and ICU at BC Children's Hospital. All participants have experienced a TBI in the previous 24 hours and are followed up within 2 weeks, and at 3, 6, and 12 months post-injury. We will be taking a closer look at the SAC (Standardized Assessment of Concussion) portion of the SCAT3 (Sport Concussion Assessment Tool), administered at Day 1 after the patients' injuries. These assessments examine patients' short term memory and concentration, and were tested within 24 hours post-injury. We are looking to see if there is a correlation between acute SAC scores and post-concussive symptoms at the four follow up time points.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Health and Wellness

Title: The Function and Abnormal Expression of TGF-beta in COPD

Presenter(s): Danica Shannon, Gura Gill, Nima Tussy, Mitchell Prost

Abstract

TGF-beta is a ubiquitous growth factor involved with a magnitude of signal transduction pathways in the regulation of cell growth, proliferation, differentiation, and apoptosis. In its cellular effect, the upregulation of TGF-beta is implicated in a series of lung pathologies, specifically in its linkage to eliciting epithelial mesenchymal transition (EMT) leading to airway fibrosis and eventually Chronic Obstructive Pulmonary Disease (COPD). Additionally, SMAD signalling pathways and the protein forkhead box P3 (FOXP3) are significantly upregulated with the increased expression of TGF-beta in patients with COPD. In this review, we are aiming to explore the potential function and abnormal expression of TGF-beta on the aforementioned pathways in COPD.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Effect of Resveratrol Supplementation on Oxidative Stress Levels in Women with Polycystic Ovarian Syndrome (PCOS)

Presenter(s): Wania Khan, Sabrina Sandhu

Abstract

The purpose of this study was to determine whether there is a difference in oxidative stress levels between women with Polycystic Ovarian Syndrome (PCOS) and healthy controls, and to investigate the effects of resveratrol supplementation on oxidative stress levels. Women recruited from the general population in this double-blinded study were divided into two groups: a healthy control group and a PCOS group. Participants were required to meet the Androgen Excess and Polycystic Ovarian Syndrome Society's criteria for the diagnosis of PCOS. Participants underwent a questionnaire to measure age, body mass index (BMI), amount of physical activity, current diet, and a blood test was used to quantitatively determine levels of lipid peroxidation and reactive oxygen species. Oxidative stress was measured using two biomarkers: nitric acid (NA) and malondialdehyde (MDA). Additionally, the PCOS group was further divided into two groups, one that underwent a treatment in which oral resveratrol (250 mg) was supplemented daily, and a control group given a placebo. A blood test was then administered every three months for the duration of a year to track levels of oxidative damage. A t-test showed that PCOS was correlated with higher oxidative stress levels. Additionally, resveratrol supplementation showed a significant decrease in oxidative damage by lowering the levels of MDA and NA. PCOS is correlated with higher oxidative stress levels, and as a result makes patients more susceptible to cancer pathogenesis, reducing the symptoms of oxidative stress could therefore lower patients risk of cancer and other symptoms of PCOS.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: How does mechanical signalling regulate mammalian heart tissue regeneration post infarction?

Presenter(s): Mohammad Khamseh, Marissa Foo, Alessandra Luongo, Joey He, Kevin Le

Abstract

The American Heart Association states that someone in the United States experiences a heart attack every 40 seconds. Recent research has suggested the cellular environment of heart tissue changes as a result of a heart attack, altering communication between cells. The damaged tissues around the heart lead to an accumulation of scar tissue and a subsequent decrease in heart function. By studying the proteins that connect heart cells to this environment, researchers can better understand the damaged heart tissue and its possible regeneration. These proteins can be studied using gene-editing tools to induce specific mutations that alter how heart cells of embryonic mouse models communicate with their environment. We propose using these mutants in experimental conditions where heart attacks are induced through administering a high cholesterol diet and strenuous exercise. Heart tissues can then be surgically sampled after the heart attack and compared with healthy heart tissues to observe the effects of the mutation. As a result, this protein and its role specifically disrupted by the mutation can be found to have a role in mechanical signalling and the recruitment of cells involved in tissue repair. This study could help develop new drugs that target these signalling pathways and strategies to improve regeneration of heart tissue in patients.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: HDACi affect on Clinical Treatments, Genome Instability as well as Genome Toxicity

Presenter(s): Crystal Chu

Abstract

Histone deacetylases (HDACs) are proteins involved in the regulation of gene expression through the modulation chromatin accessibility. Dysregulation of normal histone deacetylation within a cell results in aberrant transcriptional programs, which can contribute to cancer initiation and progression. The contribution of HDAC activity in cancer has become increasingly appreciated over the past decade, and the development of HDAC inhibitors (HDACi) like vorinostat has shown promise in the clinic against a variety of blood cancers. Although HDACi has been found to induce cancer cell differentiation, cell cycle arrest and apoptosis through the re-wiring of transcriptional programs, the non-transcriptional effects of HDACi remain poorly understood. Recent evidence has suggested that HDACi induces genome instability in cancer cells, although the detailed mechanisms remain unclear. The current project aims to investigate the effects of HDACi on genome integrity by using standard molecular biology techniques to monitor DNA damage accumulation and DNA damage response (DDR) pathway activation in cancer cells, and a genome-wide CRISPR screen to identify genes that sensitize cancer cells to HDACi treatment. Ultimately, this research will provide new knowledge on the mechanisms leading to HDAC inhibition toxicity and should uncover new therapeutic avenues that could improve current treatments and prognosis.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Retinal Dopamine Receptor Knockout and Myopia in Chicks

Presenter(s): Petar Koncarevic, Randi Shen, Sophie Carriere

Abstract

Myopia (nearsightedness) is a condition characterized by the inability to see distant objects clearly. There is no known cure, and its prevalence is rapidly growing worldwide; up to one-third of the world's population may have myopia by 2020. The mechanism underlying myopia development is unknown, but previous studies have shown that the neurotransmitter dopamine inhibits eye growth. Pharmaceutical techniques that activate or block the various dopamine receptors in the eye have been used in efforts to understand this process, but drugs lack precision in targeting a single receptor when used at high concentrations. To resolve this limitation, this study will investigate the roles of dopamine receptors in myopia inhibition by individually knocking out each receptor using CRISPR-Cas9 technology. We hypothesize that all four of the dopamine receptors (D1R, D2R, D3R, and D4R) work in conjunction to inhibit myopia, however removing D2R would have the most prominent effect in preventing its onset. To test this hypothesis, myopia will be induced by applying frosted diffuser goggles over the right eye of chicks with one of the four dopamine receptors genetically removed; the left eye will be left open as a within animal control. We will measure the difference of refractive error and axial length to determine the amount of induced myopia, and dopamine levels will be recorded through high pressure liquid chromatography. Identification of the receptors responsible for inhibition of myopia by dopamine will answer a question that has eluded scientists for decades, and may lead to novel therapies for human myopia.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Effect of Platelet-activating Factor on Tissue Specific Mast Cells

Presenter(s): Amy Wang, Isabella Factor, James Souza, Lucy Li

Abstract

The immune system consists of multiple lines of defense to combat pathogen invasion and maintain tissue homeostasis. Mast cells are critical immune cells located in tissues near the host-environment interface. Different subsets of surface receptors and cellular proteins are expressed depending on the tissue that mast cells mature and reside in, making them a highly diverse cell population. Mast cells are typically involved in inflammatory responses, however, dermal mast cells can also mediate immunosuppression. The key mediator involved in inducing this immunosuppression is platelet-activating factor (PAF). PAF is sensed by PAF receptors (PAFRs) expressed on the surface of dermal mast cells and induces the upregulation of CXCR4 receptor, allowing migration towards lymph nodes where they release an anti-inflammatory mediator. In the intestinal epithelium, PAF induces inflammation, however the effect of PAF on intestinal mast cells is unknown. This proposal aims to determine whether intestinal mast cells migrate to lymph nodes in response to PAF stimulation. We will utilize flow cytometry to first determine whether intestinal mast cells express PAFR, then to measure the surface levels of CXCR4 on intestinal mast cells before and after administering PAF to determine if subsequent migration to lymph nodes could occur. We hypothesize that intestinal mast cells do not migrate to lymph nodes upon PAF stimulation due to varying surface receptors and tissue-specific differences. This research will provide insight into the different roles of tissue-specific mast cell subpopulations in maintaining immune homeostasis and lead to a better understanding of inflammatory diseases in the gut.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: A Sub-study of CAN-TBI: the creation of a national database and Biobank for traumatic brain injuries

Presenter(s): Martina Knappett, Victoria Purcell

Abstract

Effective treatment of traumatic brain injury (TBI) remains one of the greatest unmet needs in public health. Greater than 1.5 million Canadians are currently living with a variety of somatic, cognitive, and psychological symptoms. Researchers collaborating on the Canadian Traumatic Brain Injury (CanTBI) Study aim to create a large, high quality database on TBI in order to establish more precise methods for TBI diagnosis and prognosis. This multi-centre, longitudinal study intends to recruit 450 TBI and 150 trauma control (TC) patients from seven hospitals across the nation. All participants have experienced TBI or an orthopaedic injury (not involving the head or neck) within 24 hours, and are asked to provide a blood sample for the biobank. Subjects are then followed up with at 2 weeks, 3 months, 6 months, and 12 months post-injury.

The local study team at Vancouver General Hospital aims to recruit 60 TBI and 30 TC participants from the CanTBI patient population to complete additional psychiatric assessments, neurocognitive testing, and advanced imaging techniques to create a comprehensive clinical, imaging, genomic, and proteomic dataset. We hypothesize this highly integrated and widely accessible database will act as a catalyst for TBI clinical trials and contribute to improved TBI patient classification.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Effect of Smoking History on the Perceived Harm of Electronic Cigarettes versus Conventional Cigarettes

Presenter(s): Kimia Ziafat

Abstract

Electronic cigarettes (e-cigs) are advocated as a harm-reduction tool but noted as a potential gateway tobacco product. Its usage may be determined in part by the perception of e-cigs; however, stakeholders' understanding of how e-cigs are perceived among smoker and non-smokers remains limited.

This study combined data over six cycles of the Health Information National Trends Survey (HINTS), collected by the National Cancer Institute. Survey-weighted logistic regression methods were used to evaluate the effect of smoking history on the perceived harmfulness of e-cigs vs. cigarettes.

A total of 19,251 responses were collected and weighted to allow results to be nationally representative of the US population. Among the respondents, most (59.2%) had never smoked, 27.6% were former smokers, and 14.2% were current smokers. 57.6% of the general population and 44.3% of the current smoking population believed that e-cigs were at least as harmful as conventional cigarettes. Comparatively, 56.7% of former smokers and 61.9% of non-smokers believe that e-cigs were at least as harmful as conventional cigarettes. A significant correlation was found between smoking history and the perception that e-cigs were at least as harmful as conventional cigarettes. These findings suggest that public health campaigns that promote e-cigs as a smoking cessation option while cautioning the general public against their use may be effective.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Doomed to Cooperate: Canada and Russia's Arctic Relations in the Context of the Crimean Crisis

Presenter(s): Alexandra Slobodov

Abstract

Earth's rapidly changing climate is causing Arctic ice to melt at an increasingly faster rate, creating a collision of interests that are vulnerable to geopolitical tensions as states rush to claim new trading networks and natural resources. The two biggest Arctic states, Canada and Russia, have the most at stake in the Arctic, an area that has been critical to their respective security and economy. The 2014 Crimean Crisis caused severe damage to Canada and Russia's relationship as the Canadian government condemned Russia's actions and imposed heavy economic sanctions. Existing research on Arctic geopolitics has focused on Russia's relations with the West, but not specifically on how the 2014 Crisis affected Canada and Russia's unique relationship. Since 2014, Canada has taken a hard-line stance, ceasing nearly all cooperation with Russia, except in the Arctic. This study explores why the Arctic has remained an area of cooperation during an era defined by the freezing of all other bilateral relations, applying international relations theories of complex interdependence, liberal intergovernmentalism, realism and the bargaining model. Russia's relationship with Norway in the Barents Sea, a body of water adjacent to the Arctic Ocean, is used as a case study that is applied to Russia and Canada's relationship. This project employs qualitative methods such as analyzing bilateral and multilateral agreements, speeches and official policies before and after 2014, as well as conducting an interview with an Ambassador that was stationed in Russia around the time of the Crisis. Quantitatively, the bargaining model suggests that the two states cooperate in the Arctic, despite their strained relations, because mismanagement of the region could prove costly to their respective national securities. The research findings aim to address whether cooperation in the Arctic can open up a larger dialogue to ease the tensions that currently define Canadian - Russian relations.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Effect of Smoking History on the Perceived Harm of Electronic Cigarettes versus Conventional Cigarettes

Presenter(s): Amy Wang

Abstract

Electronic cigarettes (e-cigs) are advocated as a harm-reduction tool but noted as a potential gateway tobacco product. Its usage may be determined in part by the perception of e-cigs; however, stakeholders' understanding of how e-cigs are perceived among smoker and non-smokers remains limited.

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WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Head and Eye Movements While Walking

Presenter(s): Asya Aksoy, Payton Kufeldt, Lea Farah, Ethan Yeung

Abstract

Much is known about how people look at things in laboratory settings when the head remains stationary because of the constraints associated with eye tracking technology. Little is known about how people attend to their natural environment. In the present work, we investigate unconstrained head and eye movements movements by having participants wear a mobile eye-tracker while navigating through the floors of University of British Columbia student Nest building. In this experiment we manipulate the environmental complexity, or rather the amount of factors within the environment which ones needs to process, as well as the participants' cognitive load, which is the total amount of mental activity imposed on one's working memory at any point in time, in order to measure the effect that these changes will have on the position of the participants eyes relative to the head. In this experiment environmental complexity is manipulated by having the participants walk the same path during busy and non-busy time periods. Cognitive load is manipulated through giving participants a mental task while they walk. We predict that increasing environmental complexity and cognitive load will increase the dissociation between the eye and head position. From this we will be able to see more accurately if the eye moves around more often or whether the eye tends to stay in the center of the head, allowing us to discern how one naturally sees and focuses their attention in day to day life.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Campus Community Participation in Undergraduate Students at UBC Vancouver

Presenter(s): Joe Stieb

Abstract

Community participation is valued by universities as important to the development and well-being of university students. There is limited published research regarding university students' community participation (either on- or off-campus), particularly in a Canadian context. To help address this knowledge deficit, this study examines levels and types of on- and off-campus community participation (OOCCP) among undergraduate students at UBC Vancouver. For the purpose of this study, OOCCP is defined as encompassing social clubs, community service/volunteering, sports/recreation organizations, religious organizations, political activities (including voting on- and off-campus), and work and learning program experience (including community service learning, co-op, internships, and part-time paid employment such as in the food and service industry). The study also examines the positive (i.e., altruistic tendencies) and negative factors (i.e., lack of time and/or transportation) that influence participation, and whether OOCCP is related to life satisfaction. The research is informed by the concept of social capital - the total of an individual's social connections in formal (e.g., organizations) and informal (e.g., friends and family) networks. From a sample of 63 undergraduate UBC students, who completed a self-administered survey, statistical analyses revealed that although altruistic tendencies, and lack of time and transportation partially predicted OOCCP, on- and off-campus community participation was not a significant predictor of life satisfaction. These findings may reflect that other important factors (e.g., level of interest, knowledge of opportunities, socioeconomic status, academic performance) may influence OOCCP and life satisfaction beyond those included in this analysis.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: How can different uses of clickers in post-secondary classrooms impact self-regulated learning

Presenter(s): Annabella Feeny, Yasemin Ozcitak

Abstract

Student engagement can be challenging due to crowded lectures that are most common in universities. The integration of clickers into university lectures have the potential to transform these settings into interactive student environments by providing a tool that facilitates instant feedback about specific course content from the students to the lecturer. Instant feedback allows lecturers' to assess knowledge retention on course material. However, few studies have examined how the different uses of clickers can be utilized to impact students' self-regulated learning in university lectures. The primary objective of this proposed study is to examine how different uses of clickers (process oriented and summative) impact students' self regulated learning in university lecture settings using the measures of student engagement and motivation. These variables will be measured using a modified version of the Learning Through Reading Questionnaire (LTRQ) focused on the use of clickers. To do this, we propose a between groups design that evaluates the use of clickers in first year psychology and computer sciences classes. For each class, approximately a hundred university students are needed and each must possess their own clicker. The results of existing literature suggest that the use of clickers in a process oriented in post secondary classrooms correlates with higher student engagement and motivation.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: What are the factors affecting uptake of cervical cancer screening among women of reproductive age in Sierra Leone?

Presenter(s): Monique Sandhu, Waris Bhatia, Sia Jan-abu

Abstract

Background: Cervical cancer is the second most prevalent cancer, and the leading cause of cancer-mortality among women of reproductive age in Sierra Leone. Early screening for cervical cancer has been shown to reduce mortality rates and prevent progression of the disease to late stages. However, recent data reported lower cervical cancer screening rates in Sierra Leone, the reasons for which are not known. Although barriers to cervical cancer have been identified for neighbouring countries, barriers to care are highly context-specific, mainly due to differences in healthcare systems and demographics. Therefore, the aim of this study is to assess factors affecting uptake of cervical cancer screening among women of reproductive age in Sierra Leone.

Methodology: We will use an explanatory mixed methods approach to assess factors affecting uptake of cervical cancer screening. A cross-sectional study will be conducted among a random sample of 1000 women aged 15-49 years and a questionnaire will be administered to collect information on demographic characteristics and other relevant information for the study. The primary outcome of the study will be generated based on self-reported information regarding whether a woman was screened or not. A qualitative part consisting of semi-structured interviews will gather additional details on the barriers.

Implications: The findings of this study will identify barriers to cervical cancer screening in Sierra Leone and could help establish measurements to counter the prevalence of these obstacles. The study will inform the Ministry of Health and other stakeholders of appropriate interventions for improving cervical cancer screening uptake.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Majority Minority Descriptive Norms and Their Influence on Injunctive Norm Perceptions

Presenter(s): William Zheng, Nakul Gupta, Jane Min

Abstract

Various research in the social sciences has shown that people are influenced by, and often adjust their behaviour to fit within, social norms, particularly the two important categories of descriptive and injunctive norms (Schultz et al., 2007, Miller & Prentice, 2016, Schultz et al., 2007). This research investigates how framing descriptive ethical scenarios as being common (majority frame) or uncommon (minority frame) can influence individual's moral judgment of the behaviour and their perceptions of the injunctive norm. Building on research from the "common is moral" (CIM) heuristic which suggests that the relative frequency of social behaviours serve as a basis for moral judgment (Lindström et al. 2018), we propose that majority frames are especially effective when they involve members of an in-group rather than an out-group as in-groups have a stronger influence on perceived injunctive norms. More specifically, participants presented with an ethical action in the majority frame (e.g. 75% of students purchase recycled products) will perceive the action as more ethical and an injunctive norm than the same action presented in the minority frame (e.g. 25% of students purchase recycled products), particularly when members of an in-group are involved (e.g. UBC vs SFU students). These perceptions of morality and injunctive norms are predicted to drive ethical behaviour, offering an explanation of how social norms influence action. This study also illustrates potential framing methods firms may be able to utilize to nudge the moral perceptions and subsequent actions of consumers.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Individual and Society

Title: Cognitive Language Processing of Mandarin Words

Presenter(s): Marcus Lo, Kari Lo

Abstract

The study investigated whether Mandarin words of similar meaning were collectively stored and activated cognitively during language processing. The study was designed to help understand how our brains store, activate, and retrieve words with similar meanings. Twenty target word pairs with lexically similar meanings and twenty non-target word pairs with unrelated meanings were presented to native Mandarin speakers in a lexical decision task. Forty nonword pair counterparts were also created. The task of the participants was to determine whether each word was a real or nonword of Mandarin (a lexical decision). The primary dependent variable was the response time of the lexical decision. Shorter response time for semantically related Mandarin words than unrelated Mandarin words was predicted. A linear mixed effects model revealed no significant effect of semantic relatedness on response time, suggesting that words of similar meaning in Mandarin are not collectively activated and stored during speech perception. These results bear on work concerning the status of morpheme storage in languages where sound-symbol correspondences are syllabic (i.e. Mandarin) vs. phonetic (i.e. English).

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: The World is Fair, Even if I Suffer: Meaning in Life and Just World Beliefs Function in Chronic Pain Patients

Presenter(s): ashley lee

Abstract

Just world beliefs can provide people with structure when they experience a lack of control or uncertainty (Nudelman et al., 2016) in their lives. Chronic pain is an uncertain condition, and people with chronic pain have been shown to experience less meaning in life and lower feelings of control (Younger et al., 2008). However, studies of Belief in a Just World (BJW) among people with chronic pain has received mixed results. Some studies suggests that BJW facilitates coping for those with pain (McParland, 2010), whereas others have shown that it predicts adverse reactions (Trost et al., 2014). Recently, many researchers have distinguished between BJW-self and BJW-other (Lipkusa et al., 1996). BJW-others, the belief that the world is just for people generally, is correlated with neuroticism and derogation of victims, which can be seen as negative side effects of BJW. BJW-self, the belief that one's own world is just, is correlated with life satisfaction and subjective well-being, which seems to be a positive/adaptive consequence of BJW (ibid.). Given that BJW-self dimension captures the adaptive/positive outcomes of high BJW, we used this measure to investigate how it relates to pain and uncertainty in chronic pain patients. Our hypothesis that (1) chronic pain subjects with higher BJW-self will show less intolerance for uncertainty and that (2) BJW-self moderates the relationship between pain and intolerance for uncertainty was not supported. However, JWB-self predicted meaning in life. And JWB-self also moderated the relationship between pain and meaning in life.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: A comparative study of two MRI techniques: myelin water fraction (MWF) and inhomogeneous magnetization transfer ratio (ihMTR) used to confirm the effect of temperature on myelin signal detection in white matter.

Presenter(s): Rozhin Ressideh, Ravneet Tiwana, Arielle Hulsman, Prableen Sandhu, Abesan Rasan

Abstract

The myelin is an essential brain component, protecting axons and accelerating signal transmission along nerves. The most well-known disease concerning myelin is multiple sclerosis (MS), an autoimmune disease affecting 1 in 385 Canadians. Despite decades of research, it is still challenging to monitor the degree of myelin destruction in patients. New techniques of magnetic resonance imaging (MRI) have shown promising results and seem to be able to quantify the myelin. However, their signal intensities appear to be different when we compare the results from a living brain (in vivo) with a brain sample (ex vivo). An explanation could be the experimental temperature (in vivo at 37°C and ex vivo at 20°C). For this study, we scanned a cortical human brain sample at different temperatures with a high field MRI system, and studied the signal detected in the white matter, which is rich in myelin. The two techniques used in our study were inhomogeneous magnetization transfer ratio (ihMTR) and myelin water fraction (MWF). Both techniques quantified the myelin using two distinct physical mechanisms. The data obtained confirmed the temperature dependency of these two methods. On a temperature range of 20°C to 37°C, the ihMTR signal increased linearly by 116% whereas the MWF signal decreased linearly by 29%. This demonstrates that temperature has an inverse effect on the two techniques. This study concludes that temperature plays a significant role in myelin signal detection, which is an important factor to consider when quantifying myelin in ex vivo samples and in vivo.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Using sensors for falls prevention in dementia care: A systematic review

Presenter(s): Litsa Rethimiotakis, Yihan Xia, Claire Tiberghien, Crystie Situ

Abstract

Falls are a major cause of injuries among older adults with dementia and not detecting falls early enough may result in higher risks of complications. Although sensors have been used to monitor falls, no research has synthesised information on how sensors have been used in falls prevention in dementia care. It is also not clear what advantages and limitations sensors have compared to other forms of fall monitoring technology. This research will explore how sensors have been used in falls monitoring among older adults living with dementia, as well as the strengths and limitations of using sensors in falls detection.

This systematic review will utilise the PRISMA checklist and involve a search of electronic databases such as MEDLINE, PsycINFO, EMBASE, and CINAHL. The PICO process will guide the literature search, with focus on the Population of interest, the Intervention, and the Outcome. Search terms will include appropriate MeSH subject headings and keywords describing the use of sensors in falls monitoring among older adults with dementia. The articles resulting from the search will be screened by 2 reviewers using the same inclusion and exclusion criteria. Variables of interest will be listed and defined to ensure a systematic extraction of information from the literature. A narrative synthesis will be done using a quality of life framework and the information collated from the relevant research articles will be interpreted accordingly to meet the research objectives.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Recovering Information Lost in a Black Hole: Exploring A Geometric Equivalent to the Kitaev-Yoshida Algorithm

Presenter(s): Ben Holmes, Amrit Guha, Anusika Nijher

Abstract

The holographic principle states that gravity within a 3D object can be fully described by a quantum mechanical system on the surface of the object, and it is a powerful tool when examining problems involving black holes. As a black hole evolves, it shrinks and emits energy in the form of Hawking radiation. Hayden and Preskill suggested that this radiation could in theory be decoded to recover information about what went into the black hole. The black hole lives inside a 3D universe, but most papers published about this topic have examined the quantum mechanical system that lies on the surface of that universe. This includes Kitaev-Yoshida, who developed a quantum computer algorithm to decode the radiation. However, an observer inside the 3D universe is much more limited in what they can do when compared to the person running the quantum computer on the surface. This project hopes to use the holographic principle to find the gravitational equivalent of the Kitaev-Yoshida algorithm, which could provide a method for local observers to recover information lost in a nearby black hole.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Impact of "Playpens" on Laboratory Rat Welfare

Presenter(s): Nisha Raghukumar

Abstract

Laboratory rats (*Rattus norvegicus*) are typically housed in small, simple cages that compromise their welfare. Specifically, standard laboratory housing restricts rats' ability to express a suite of natural behaviours, and research has shown that this negatively affects their well-being. The purpose of this study was to assess whether the welfare of standard-housed laboratory rats is improved by providing rats with regular access to larger, enriched "playpens", where they were able to engage in natural behaviours such as play, exploration, burrowing and running. These playpens are larger and are equipped with burrowing and nesting material, hammocks, fabrics and a shallow tray of water. The advantage of playpens is that they are relatively convenient and inexpensive to implement. This project recorded the occurrence of behaviours associated with positive welfare (play and affiliative behaviours) and negative welfare (aggression and sleep fragmentation) in standard-housed laboratory rats who had access to playpens for one hour per day, four days per week, compared to a control group who had access only to another standard cage. Rats were filmed in their home cages and videos were scored by a blind observer for the above behavioural parameters. We hypothesize that rats with access to the playpen will display more behaviours associated with positive welfare and fewer behaviours associated with negative welfare in their home cages compared to control rats. If the hypothesis is well-supported, this study would provide evidence that providing rats with regular access to playpens is a worthwhile endeavor that could improve their welfare in laboratory settings.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Designing a smart control system for quadrotor

Presenter(s): Ranky Lau, Daniel Wang, Manu Koipallil

Abstract

In recent years, quadcopters have become increasingly common in both indoor and outdoor use and for both recreational and commercial use. A lot of research has been conducted on modelling and stimulating a quadcopter in a virtual environment, and various control systems have been developed on controlling quadcopters. However, little research has been conducted on designing a control system which optimizes the path that a quadcopter takes from point A to B with respect to an objective function, such as minimizing the time taken or amount of energy consumed, while taking consideration into different environmental factors during flight such as wind speed. In this poster, we will model a quadcopter in a simulated 3d environment using Euler's method. Then, we will apply and compare various prediction method such as regression and neural network to predict the wind speed and magnitude during the flight. Finally, we will develop a control system that will utilize wind information to control the quadcopter during the flight to reduce energy consumed or time taken or a weighted function of both.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Effect of Surfactant on Sorting of Bidispersed Colloidal Particles from Evaporation of a Sessile Droplet

Presenter(s): Ivy Shi

Abstract

An evaporating droplet, containing two different sizes of colloidal particles, forms a dual ring of deposit with particles sorted based on size under certain conditions. This phenomenon attracted research attention due to its potential applications. For example, it might be utilized for diagnosing diseases by sorting the cells in blood; it might also be used for forming certain patterns on biosensors. The primary goal of this project is to achieve size-based particle sorting in the presence of the surfactant from the evaporation of a droplet containing bidispersed particles. Sodium dodecyl sulfate (SDS) is selected as the surfactant due to its ability to induce flow inside the droplet and the concentration of the surfactant will be varied to study the effect of surfactant concentration. The effect of particle size ratios will also be investigated by keeping the size of smaller particles constant ($1\mu\text{m}$) and varying the size of larger particles ($2\mu\text{m}$, $3.2\mu\text{m}$, $5\mu\text{m}$). Fluorescent particles will be used to distinguish the different particles. The particle motion and final deposition pattern will be observed using a confocal microscope recording from the bottom. The vertical cross-section view of the droplet will be obtained by an Optical Coherence Tomography (OCT) imaging system to visualize the fluid flow inside the droplet. The observation and the data of the experiment will be analyzed to see if the presence of surfactant will affect the sorting performance and alternate the deposition pattern. Based on the experiment conducted as far, different particle deposition patterns were observed with surfactant concentration varied.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Automated alignment and segmentation of brain images using machine learning

Presenter(s): Debon Lee, Maxwell Wang, Sue Baek, Lydia Li, Noor Brar

Abstract

Quantitative analysis of large scale brain images relies on accurate alignment and segmentation of regions of interest. Matching a reference atlas to the data are very labour- and time-intensive manual tasks and prevent high-throughput analysis. Furthermore, human error may occur when clicking the anatomical landmarks in different subjects. Machine learning-based alignment and segmentation approaches for brain images are gaining interest due to their self-learning and generalization ability when applied to large amounts of data. As deep learning architectures are becoming more mature, they gradually outperform previous state-of-the-art classical algorithms. Our aim is to develop an automated machine learning-based alignment and segmentation approaches for quantitative brain images. We first trained a deep learning model (DeepLabCut) to identify specific landmarks (i.e. bregma, lamda) in a wide-field calcium imaging dataset from more than 200 transgenic mice. The model can then automatically label landmarks in a new dataset of calcium images with high accuracy. Automated mouse atlas alignment and segmentation onto the calcium images was then performed using open source computer vision based on previously labelled landmarks. The deep learning model can be further optimised by training on larger datasets and is capable of processing large-scale brain images automatically under a few minutes. We propose to further demonstrate that our method significantly enhances the accuracy and robustness of alignment and segmentation of new data sets.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: the effectiveness of applying neural ordinary differential equations on domains of path finding in simple robotic arm

Presenter(s): Juho Pyo, Matthew Tang, Hyehwa Lee

Abstract

An artificial neural network is a general purpose computer algorithm inspired by the biological brains. It is based on a collection of artificial neurons arranged in layers which are connected to each other like the synapses. Recently, researchers have introduced a new type of neural network called neural ordinary differential equations (NODE). Unlike traditional neural networks with discrete layers, these types of network are continuous by framing a neural network as differential equations. The memory cost of adding depth to this network is constant. In addition, it appears that the network could achieve similar performance compared to other types of network fewer parameters. In this paper, the effectiveness of applying this type of network in the domain of robotic pathfinding will be tested. This will be done by optimizing a simple 2-D robotic arm's trajectory using NODE and other methods under certain constraints (eg. energy). A comparison of the result of the trajectory produced by the methods and their computation cost will be made to determine the effectiveness of NODE.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Investigation of Potential Contaminants at Salish Creek

Presenter(s): Gurvir Dhutt, Steven Dang

Abstract

With recent declines in wild salmon stock across British Columbia (Noakes et al., 2000), it is imperative for spawning locations to be as conducive to salmon health as possible. With the recent restoration efforts to the mouth of Salish Creek, our team investigated potential contamination of the stream water to ensure that spawning salmon will have the best chance of survival. Ten different abiotic factors were considered: soil pH, alkalinity, chlorine, iron, nitrites, nitrates, water pH, total water hardness, copper and lead. Measurements were conducted at three different sites along Salish creek: the source of the creek, the head of the creek, and the rehabilitated mouth of the creek. Measurement of the abiotic factors was done according to the 9 in 1 test kit with the exception of soil pH, which was measured according to the Streamkeepers' Handbook. Overall, total water hardness and soil pH were found to be significantly different between the sites (p-value = 0.00702 and 0.0281 respectively). In addition, only nitrate was found to have a significant correlation with soil pH (p-value = 0.00594). Considering the results of this investigation, we believe that there are no potential toxic compounds that may interfere with salmon health present in the waters at Salish Creek.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Hungry, Hungry Oysters: The effects of cornmeal as a feed substitute on growth in *Crassostrea gigas*

Presenter(s): Alessandra Gentile, Jordyn Shaw

Abstract

Crassostrea gigas is the most widely cultured oyster in the world. A large cost in *C. gigas* rearing is the production of pure algal feed. Identifying cost effective alternatives to pure algal feed could increase hatchery profit. Experimentation with cornmeal substitution has yet to be studied in *C. gigas*. Cornmeal is an alternative that can be easily stored and introduced by hatcheries, that contains both carbohydrates and proteins. The goal of our experiment was to quantify growth in *C. gigas* fed a pure algal diet compared to an algal diet partially replaced by cornmeal, over a period of three weeks. Using three feed treatments: (1) pure algal, (2) a 40% reduction in pure algal, and (3) a mixture of algal and cornmeal (60% algal: 40% cornmeal), we were able to quantify the effect of cornmeal substitution on mortality and growth. There was marginal evidence that treatment had an effect on the number of deaths ($p = 0.067$), with higher deaths in the reduced algal (2) and the cornmeal substitute (3). Treatment did not have a statistically significant effect on change in bin weight ($p=0.522$) or change in individual weight ($p=0.247$); however, a trend was seen in change in individual weight, where the cornmeal substitute (3) showed increased weight change, in comparison to other treatments. More research is needed to confirm the viability of cornmeal as a feed substitute; however, if cornmeal does have a positive effect on growth, as the trend suggests, hatchery implementation could reduce *C. gigas* rearing costs.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Effects of increased soil water content on the composition of Douglas-fir root fungal communities

Presenter(s): Tom Howey, Eully Ao, Qiuning Lyu, Chris Hou Hou

Abstract

While it has been observed that increased precipitation can have negative effects on plant fungal symbionts (Tedersoo et. al, 2012), the direct cause of this is as yet unknown. In the present study, we propose testing the effect of increased water content in soils on the composition of Douglas-fir root fungal communities. To do so, fungi samples will be collected and sieved to isolate spores before sterilizing the soil and reintroducing the spores. Treatments include controls with average BC water levels with and without microbes as well as drought and three increments of water levels higher than the control. The species richness and abundance will be recorded over time. We hope to identify a possible mechanism which leads to the decline in functional diversity after large rainfall events, previously identified by Hawkes et. al (2010). This proposed study could in turn provide insight into predicting which plant fungal symbionts may be most affected by increased precipitation brought on by climate change.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Effects of increased soil water content on the composition of Douglas-fir root fungal communities

Presenter(s): Ralph Uy, Yvonn De Las Alas

Abstract

While it has been observed that increased precipitation can have negative effects on plant fungal symbionts (Tedersoo et. al, 2012), the direct cause of this is as yet unknown. In the present study, we propose testing the effect of increased water content in soils on the composition of Douglas-fir root fungal communities. To do so, fungi samples will be collected and sieved to isolate spores before sterilizing the soil and reintroducing the spores. Treatments include controls with average BC water levels with and without microbes as well as drought and three increments of water levels higher than the control. The species richness and abundance will be recorded over time. We hope to identify a possible mechanism which leads to the decline in functional diversity after large rainfall events, previously identified by Hawkes et. al (2010). This proposed study could in turn provide insight into predicting which plant fungal symbionts may be most affected by increased precipitation brought on by climate change.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Sustainability and Conservation

Title: Methylmercury in Pilot Whales

Presenter(s): Brian Low, Leo Zhao

Abstract

Methylmercury is an extremely potent neurotoxin often found in aquatic ecosystems. Humans are therefore at risk of methylmercury poisoning due to the mass consumption of aquatic creatures. It is thus vital to quantify the accumulation of methylmercury in aquatic mammals. A model was developed to study the accumulation of methylmercury in pilot whales' brains. Of particular interest is the toxin's rate of transference from the brain to the blood. Based on the model and a system of mass balance differential equations, a significant correlation between food intake and accumulation of inorganic mercury in the brain due to the conversion from organic mercury was also found for a range of age groups.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Endophytic Microbial Communities and Viruses Associated with the Lodgepole Pine in Forests of British Columbia

Presenter(s): Jack Cheng, Paul Tang, Savanna Skinner

Abstract

Lodgepole pine (*Pinus contorta*) is one of the most abundant trees in the forests of British Columbia (BC) and is affected by several damaging fungal diseases, including *Armillaria* root diseases caused by different *Armillaria* species. The goal of this investigation is to identify the endophytic bacteria, archaeobacteria and fungi as well as viruses associated with the pine. Secondly, we also attempt to find and identify possible endophytic microbes or viruses that can control the fungal disease. To this end, sampling will be done from different parts of both asymptomatic and symptomatic pine plants (showing *Armillaria* root disease symptoms) grown in BC forests. Endophytic fungi will be isolated in agar based media. The isolated fungi will be biologically purified by using hyphal tip culture method and identified by using ITS primers. The antagonistic effects of these fungi will be tested through in vitro experiments. Fungal species with good control activities will be subsequently selected and tested against the disease under greenhouse conditions. The presence and identity of mycoviruses with RNA genomes in these fungi will be also investigated by dsRNA extraction, gel electrophoresis and sequencing by using high-throughput sequencing (HTS). Similar approaches will be performed to find plant RNA viruses in the pine samples. In the second step, endophytic bacteria and archaeobacteria, and fungi of different parts of the pine samples will be identified by universal 16S- and 18S-rDNA primers, respectively, followed by HTS; the microbial communities of symptomatic and asymptomatic will be then compared to identify possible microbes/viruses involved in the disease resistance/tolerance in the pine plants. This study is the first step towards understanding microbial endophytes and viruses of lodgepole pine. These findings will also hopefully help us to improve better control strategies against *Armillaria* root diseases in BC in the future.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Continuous Study: A population study on Chinook Salmon (*Oncorhynchus tshawytscha*) in the Capilano River Hatchery

Presenter(s): Robert Hechler, Isaac Clark

Abstract

For several decades Chinook salmon populations have been declining in the Pacific Northwest, mostly caused by a combination of increasing demand of Chinook in fisheries, increased predation pressure, and a decrease in survival and reproductive success due to climate change. Pacific salmon are a keystone species in the ecosystem, thus a decline in the population will have serious effects on other species and the environment. In order to recover the Chinook population, hatcheries were built as an additional source for restocking salmon populations. However, the recovery efficiency of hatcheries has long been doubted. In order to find the current salmon population recovery of the Pacific Northwest ecosystem, a continuous study was carried following the same procedure is done by Houwelling et al. (2017). Our study focused on 1) whether the increase in the number of returning Chinook last year was an outlier or not, and 2) testing if the population of Chinook salmon is still decreasing in terms of the number of salmon returning to the hatchery. Data was collected by counting the number of Chinook returning over one hour periods. By averaging the number of five trials and calculating the estimated total number of returning, we compared this year's estimation with the estimation calculated in the previous study. The result showed an increasing returning number ($W = 46$, $p\text{-value} = 0.006$) compared to the 2017 returning number. Our result showed a significantly greater return number of Chinook salmon in 2018 than the return number the previous study estimated in 2017.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Species co-occurrence patterns between hummingbirds and flower mites in Peru

Presenter(s): Macgregor Aubertin-Young

Abstract

Hummingbird pollination is an important component of South American ecosystems that facilitates animal-plant interactions, and has implications for the evolution of birds, plants, and the organisms they interact with. Hummingbird flower mites (Mesostigmata: Ascidae and Mesostigmata: Blattisociidae) comprise four nectarivorous genera which disperse between individuals of their host plant species exclusively on the bills of hummingbirds. Since each flower mite species occupies a specific set of host plant species, differences in hummingbird bill shape, which determine the plant species hummingbirds are able to pollinate, likely mediate the interactions between particular hummingbird and mite species. Here, flower mites were collected from the bills of hummingbirds in Peru and later identified in the laboratory using light microscopy. Seven new species of mites belonging to four genera are diagnosed and an identification key to all species encountered is given. The majority of flower mite individuals were female and of the genus *Tropicoseius*. Of six hummingbird species, each was the exclusive avian host of at least one mite species, and specialist hummingbird *Eutoxeres condamini* transported the greatest number of species. The asymmetric distribution of flower mite species across hummingbird host species likely reflects variation in hummingbird foraging patterns. Consideration of hummingbird bill shape and foraging strategies provides insights into the evolutionary and ecological forces driving patterns of flower mite speciation. In the face of biodiversity loss, it is essential that we understand the ecological relationships and diversity of species before we are unable to.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: The Use of Chitosan in Modified Soil to Remove Harmful Marine Algal Blooms

Presenter(s): Breyanne Bautista, Rachael Kim, Katie Donohoe, Evan Broderick

Abstract

Algae has always been a common component of both fresh and saltwater ecosystems, gaining infamy in recent years due to the uncontrollable growth of algal blooms that cover the water's surface. It is pollution runoff from land that provides the substantial nutrients required for rapid algal growth, including nitrogen and phosphorus. This phenomenon is not only dangerous to surrounding ecosystems by acting as a strong competitor for oxygen and other resources, but it also poses a threat to humans with the potential release of lethal toxins that can target one's internal organ systems. Controlling the growth and effects of these species has proven to be one of the main problems that society is facing. While methods for preventing pollution runoff have been proposed, few methods regarding efficient and sustainable removal of existing algal blooms are known, if any. Aggregation is a promising solution to this issue, with chitosan-modified soil being an ideal candidate. Recent research has found that a mixture of soil, chitosan (a natural chemical), and polyaluminum chloride (PAC, an inorganic man-made chemical) can lead to the sedimentation of algae via chemical interactions when applied to the surface of algal blooms. While the applied mixture and its components are non-toxic, studies suggest that the relative toxicity of algae remains the same. With decreased oxygen levels at the ocean floor, algae will die, no longer affecting organisms near the surface as it did but potential damage to bottom-dwelling organisms is still a concern requiring future research.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Finding an Optimized Solution for Acid Rock Drainage in Large-Scale Mines

Presenter(s): Andrew Cleghorn

Abstract

Mining is a lucrative industry that exists globally. However, if a certain aspect of the project is ignored then catastrophes of any kind can occur. A primary concern pertaining to mining sites is acid rock/mine drainage. The main effect drainage has on its environment is the increased levels of acidity that it produces in the fluvial systems that it comes into contact with. The magnitude of acid rock drainage (ARD) can be identified by a mine located in B.C. known as the Britannia Mine. This mine was shut down before the mining industry became aware of ARD and is identified as one of the largest metal pollution sources in North America. Today, the industry is aware of this issue but it is still difficult to utilize a method that optimally reduces the drainage, especially when it comes to large-scale operations. The Antamina Mine Site located in the Andes mountains of Peru is one of the largest copper mines in the world. The University of British Columbia has been working on long-term project that monitors the waste rock of the mine. With this extensive data provided and use of external resources, this project will analyze the various methods available to prevent acid rock drainage and determine the solution that is most efficient at this scale. The first method under consideration is the soil removal, the second being a tarp that is positioned on the surface of the rock and third is the treatment of the drainage through a facility.

WAVE 1 | POSTER PRESENTATIONS

ABSTRACTS | 10:00AM - 11:10AM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title:

Presenter(s): Robyn Sahota

Abstract

Zooplankton play a critical role in marine food web dynamics, they are the primary consumers connecting primary producers, such as phytoplankton, with higher trophic levels. Detailed knowledge of their diets is required to understand the flow of carbon through food webs, via zooplankton, and how this may vary with climate change. Oceans are a resilient and highly variable environment; however, recent warming conditions have altered the composition of the base of the food web resulting in unknown cascading effects. In May and September 2018, I collected and sorted abundant crustacean and gelatinous zooplankton species, in partnership with the Department of Fisheries and Oceans, at 8 on- and off-shelf stations along the West Coast of Vancouver Island. Through fatty acid extraction and visualization with gas chromatography I have observed the spatial and temporal differences in consumer fatty acid profiles that are associated with a lipid-rich (crustacean) classic food web versus a lipid-poor (gelatinous) microbial food web. My research assesses the differences in prey quality currently available, which may help inform scientists and managers to potential detrimental impacts on upper level consumers. This shift in prey quality, quantity and availability favouring gelatinous zooplankton have major economic and environmental implications altering the total energy available in marine systems. My research contributes to our understanding of the cascading effects warming temperatures can have on food web dynamics through the prey quality comparison of major zooplankton taxa.

WAVE 2 | ORAL PRESENTATIONS

LIST | 11:20AM - 12:30PM

Ponderosa Commons: Oak House, 6445 University Boulevard



PCOH 1001

A Molecular Cloning Approach for Organophosphate Detection and Degradation	Kate Jiang
A Look Into UBC: Mental Health Resources for International Students	Kevin Wang Mahima Kakadekar
Participatory Action Research: A Catalyst to Critically Explore Community Work and Social Development	Kiana Reyes Emi Tomioka Sarah Kang
Development of CRISPRa Tools in Prokaryotes	Siddarth Raghuvanshi

PCOH 1002

Evaluation of the Nutritional Status of Pediatric Patients in Soroti, Uganda	Cyrus Bhiladvala
Contraceptive Choice among Women Living with HIV and HIV Negative Control Women in the Children and Women Antiretroviral and Markers of Aging (CARMA) Cohort Study	Chadni Khondoker
Stephen's Migration to a Placeless Place: Art	Saba Pakdel
Evaluation of a Custom Semi-Automated Virtual Surgical Planning Platform	Edward Wang
Investigating the effect of high temperature on phenotypic plasticity in kelps	Varoon Pornsinsiruk

PCOH 1003

Ocular adverse events with immune checkpoint inhibitors	Tony Fang
The Role of International Study in Leadership Skills	Kimberley Huang

Prevention of Roll-Over

Sofia Bandeira dos Reis
Angelene Leow
Leon Chen

Eunoia: Designing for Emotional Reflection

Celine Hong

PCOH 1008

The impact of murine gut microbiota composition on susceptibility to DSS-induced colitis

Tina Madani Kia

Bilingualism is associated with reorganization of frontal lobe function in 6-month-old infants

Eloise Moss
Ana Ivkov

Plume dynamics of a picosecond infrared laser with applications in surgery and biodiagnostics

Esther Lin

PCOH 1215

Attenuating Tumor-Associated Fibrosis in Breast Cancer by Targeting Angiotensin Type-II Receptor Activity with Compound 21

Anton Dugandzic

Changing expression of the genome without changing the genome itself; epigenetic modification mediated by polyphenols

Allison Gacad

Ace and Aro: Understanding differences in romantic attractions among persons identifying as asexual

Amy Antonsen

Cliff stabilizing flora on the Point Grey Cliffs

Amanda Eliora
Shaun Yap

Effects of adult hippocampal neurogenesis in mice after receiving a Single Electroconvulsive Stimulation (ECS) or Transcranial Magnetic Stimulation (TMS)

Aydan Kesici

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: A Molecular Cloning Approach for Organophosphate Detection and Degradation

Presenter(s): Kate Jiang

Abstract

Organophosphates are widely used agricultural pesticides that possess a health threat to human and animals. The high neurotoxicity of organophosphate compounds calls for efficient strategies to detect and remove its contamination from the environment. One of the promising approaches is bioremediation with engineered microorganisms that harbor enzymes for organophosphate degradation. Previous studies have identified different genes from different bacterial species that are responsive to organophosphate presence; for instance, the novel transcription activator ChpR can recognize the chemical structure of organophosphates and increase the expression of other nearby genes. Another example is the two well-established phosphoesterases, PTE and pdeA, which can degrade the toxic organophosphate into beneficial inorganic phosphate for bacterial growth.

In this project, I am synthesizing a genetic construct for organophosphate recognition and degradation by combining ChpR and the phosphoesterases together through molecular cloning in *E.coli*. In the presence of organophosphate, ChpR response by activating the expression of PTE and pdeA; when the two phosphoesterases are expressed, they will in turn degrade organophosphate, therefore achieving automatic organophosphate detection and degradation. Two additional reporter genes are also included in this construct: a green fluorescence protein reporter, which can monitor the level of phosphoesterase expression by fluorescence intensity, and a thymidine kinase selection marker, which can be used to improve the specificity of ChpR-controlled phosphoesterase expression. Together, the synthetic construct will not only act as a novel tool for organophosphate bioremediation but also provide insights to how similar genetic clusters function inside bacteria.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: A Look Into UBC: Mental Health Resources for International Students

Presenter(s): Kevin Wang, Mahima Kakadekar

Abstract

Purpose: Approximately 26% of University of British Columbia's (UBC) students are international. International students often experience acculturation stress, stigma, and feelings of isolation when studying abroad. While previous research has demonstrated that international students face unique mental health stressors, relatively few mental health strategies at Canadian universities have sought the perspectives of international students.

Problem: This study aims to understand whether mental health services at UBC adequately meet the needs of international students.

Methodology: This research uses a qualitative thematic analysis approach. A sample of diverse international students from UBC will participate in a series of focus group discussions. Focus groups will be held at UBC. All focus group discussions will be audio-recorded and transcribed. Thematic analysis of all transcripts will be conducted by all authors.

Anticipated Results: At the time of presentation, we will discuss findings from three main learning objectives. Our findings will describe the international student mental health experience, discuss how international students access mental health supports and services and highlight how more culturally appropriate mental health resources can be provided to international students.

Implications: Addressing international student mental health need in higher education may help reduce mental health risk for students studying abroad. In addition, the engagement of international students in this research may foster the development of culturally sensitive mental health strategies at Canadian universities.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Participatory Action Research: A Catalyst to Critically Explore Community Work and Social Development

Presenter(s): Kiana Reyes, Emi Tomioka, Sarah Kang

Abstract

Participatory Action Research (PAR), also known as Community-Based Research (CBR) is progressively emerging as a social justice approach dedicated to making changes to social development and the process of research itself. At its core, PAR is concerned with the idea of praxis; when theory and action come together for direct social action and social change. This research methodology relies heavily on the dialogical relationship between the researchers and the participating communities. Dialogue is the central catalyst which provides a path where praxis can be realized. PAR acknowledges all participants as co-researchers and aims to unsettle differential power relations and the hierarchical nature of research. All parties work together to create knowledge and social change that directly benefits the community. Through this collaboration with a local community group, we were able to access vulnerable populations through the medium of dialogue.

By using a PAR framework, we were able to respectfully collaborate with a local grassroots organization to create a right-based campaign for undocumented folks or people with precarious immigration status living in Vancouver. The project included a poster/flow chart, informational wallet card, and safety plan. These were built upon true knowledge, experiences, and stories of migrant workers to develop conscientization grounded in real needs and learning of the community. Such methods included field interviews and regular meetings with the local grassroots organization to receive feedback and resources on an ongoing basis. This combination of participation, action, and research effectively and inclusively support vulnerable individuals' empowerment.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Participatory Action Research: A Catalyst to Critically Explore Community Work and Social Development

Presenter(s): Sarah Kang

Abstract

Participatory Action Research (PAR), also known as Community-Based Research (CBR) is progressively emerging as a social justice approach dedicated to making changes to social development and the process of research itself. At its core, PAR is concerned with the idea of praxis; when theory and action come together for direct social action and social change. This research methodology relies heavily on the dialogical relationship between the researchers and the participating communities. Dialogue is the central catalyst which provides a path where praxis can be realized. PAR acknowledges all participants as co-researchers and aims to unsettle differential power relations and the hierarchical nature of research. All parties work together to create knowledge and social change that directly benefits the community. Through this collaboration with a local community group, we were able to access vulnerable populations through the medium of dialogue.

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WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Development of CRISPRa Tools in Prokaryotes

Presenter(s): Siddarth Raghuvanshi

Abstract

CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is one of the most amazing inventions in the field of biology in recent years. CRISPR is a protein that is able to use a guide RNA and target regions in the cell's DNA. The protein is able to "Find" and "Cut" similar to the "ctrl-f" and "ctrl-x" functions in the if you imagine your DNA as a word document. CRISPR can therefore allow us to change a cell's DNA with a high degree of precision and modularity.

Recently, numerous scientists have found that many cells are capable of resisting the "Cut" function of this protein, by apoptosis or being resistant to the CRISPR protein. However, the "Find" function of the protein is still quite effective. So instead, various proteins and CRISPR modifications allows scientist to perform other functions, such as changing the font size to make it easier or harder for the cell to read our DNA.

One of these methods is called CRISPR activation (CRISPRa). This method has numerous advantages over CRISPR such as being safer, reversible, and allow for more complex screening techniques. My research focuses on developing these tools by modifying the CRISPR protein, and finding novel ways to implement them.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Evaluation of the Nutritional Status of Pediatric Patients in Soroti, Uganda

Presenter(s): Cyrus Bhiladvala

Abstract

Introduction

This project was implemented in order to assess the nutritional status of pediatric patients at Soroti Regional Referral Hospital. According to the Uganda Health and Demographic Survey of 2016 (UHDS 2016), the frequency of severe malnutrition (-3 SD or less) in the sub-region surrounding Soroti is 3.3% stunting, 0.4% underweight, and 0.3% wasting.

Objectives

The aim of this research is to quantify the magnitude of discrepancy between the nutritional Z-scores of pediatric patients (ages 6 months to 5 years) at SRRH, and those recorded in UHDS 2016. We assessed demographic factors, food and water security, and the patient's reason for admission.

Methods

Anthropometrics assessed were height, weight, sex, age, mid upper-arm circumference (MUAC), and bipedal edema. A survey of patient pathology, demographics, and food security was conducted at SRRH in July 2018.

Results

Data was gathered from 99 patients. Severe stunting was seen in 25.6% of patients, severe weight deficiency was seen in 24.7% of patients, and severe wasting was seen in 19.1% of patients. 74% of guardians said their children were missing key foods, the most common of which were milk, eggs, and meat. 50% of patients were concerned that their drinking water was unclean. The median family income was 41,000 UGX (14.15 CAD) per month, and the median family size was 8.

Conclusions

Severe malnutrition is a significant concern at SRRH, and is in need of systemic addressing. Patients from families earning less than 41,000 UGX per month are more often stunted and underweight.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Contraceptive Choice among Women Living with HIV and HIV Negative Control Women in the Children and Women Antiretroviral and Markers of Aging (CARMA) Cohort Study

Presenter(s): Chadni Khondoker

Abstract

Background: An estimated 60% of pregnancies among women living with HIV (WLWH) in Canada are unintended. Preventing unintended pregnancy improves maternal and family health. Combined hormonal Contraceptives (CHC, i.e. estrogen-containing) use is lower among WLWH compared to HIV-negative women; the reasons for this are largely unexplored.

Methods: Overall contraceptive and CHC use among WLWH and HIV-negative women in the last month was measured and compared between 83 WLWH and 62 HIV-negative women, aged 16-49, and sexually active. The proportion of women with concomitant drug interactions, medical comorbidities, and behavioural factors (which may influence prescribing of CHC) was compared. Fisher's exact test compared characteristic distribution stratified by HIV status

Results: Compared to HIV-negative women, WLWH were older (median [IQR]) 39 [34-43] vs 31 [23-41] years; $p=0.003$), less likely to have post-secondary education (37% vs 73%; $p=0.0002$), and more often had income \leq \$15,000/year (49% vs 30%; $p=0.006$). WLWH had more frequently undergone tubal ligation (16% vs 1%; $p=0.02$). Hormonal contraceptive use (levonorgestrel-releasing intrauterine system, progestin-only, CHC) was similar (30% vs 32%; $p=0.9$), however, WLWH used CHC less (4% vs 21%; $p=0.002$). WLWH experienced more contraindications to CHC (58% vs 13%; $p=0.0001$), such as current smoking when >35 years old (30% vs 6%; $p=0.0003$) or having a drug contraindication (all were antiretroviral-related) to CHC (29% vs 0%; $p=0.0001$).

Conclusions: Lower CHC use among WLWH may be related to a higher prevalence of smoking and drug contraindications. Findings support a need for healthcare providers to regularly discuss pregnancy desires and contraceptive options with WLWH.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Stephen's Migration to a Placeless Place: Art

Presenter(s): Saba Pakdel

Abstract

On the process of migrant writing, Marangoly George claims that "all fiction is homesickness"_. This broad claim suggests that in migrant fiction there is a desire to come back home, to be recognized, and to be protected by boundaries and a sense of sameness (Buikema and Europe 178). To Stephen Dedalus, in 'A Portrait of the Artist as a Young Man', the desire to come back home is as complicated as it is to its author, James Joyce. While experiencing periods of migrancy and foreignness, Stephen strives for achieving a sense of belonging which he lacks at home. Besides, due to his failure to achieve sameness, Stephen struggles with the place he was born into and tries to establish his own sense of subjecthood. Throughout the novel, Stephen "tries to bring himself into being as an artist" (Riquelme 103; emphasis mine). Thus, in Stephen's case, his desire for home as a migrant does not involve an actual re-entry to a geographical location. Being an artist is Stephen's ultimate state of mind where he, led by his intuition, finds a sense of belonging and subjecthood.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Evaluation of a Custom Semi-Automated Virtual Surgical Planning Platform

Presenter(s): Edward Wang

Abstract

Advanced head and neck cancers that involve the mandible or maxilla often require surgical removal of large segments of bone, including significant portions of the jaw or cheek. Reconstructing the resulting defects from these aggressive resections is essential to restore not only facial form but also its function, such as swallowing, chewing, speech and breathing. Reconstruction is afforded by transplanting donor bone, muscle and skin from the patient's own body to the resected region. Traditionally, the fibula or scapula are used as donor bone, and require multiple freehand bony cuts in complex orientations to recreate the original 3-dimensional shape. Accuracy of the reconstruction has significant restorative implications and benefits to the patient's quality of life. The current improvisational approach continues to be challenging and time consuming and may not result in an optimal reconstruction. To improve this process, patient imaging data can be used to create a reconstruction plan that is actualized through surgical cutting guides. We have developed an in-house semi-automated virtual platform that plans mandibular reconstructions from patient CT data, and generates cutting guide models that can be 3D printed. Our workflow is low cost and self-contained, which make it a viable improvement to current interventions. Over the last two years, we have been evaluating our platform clinically through a case series of twenty patients. This talk will focus on presenting the preplanning workflow and show preliminary results of the clinical trial.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Investigating the effect of high temperature on phenotypic plasticity in kelps

Presenter(s): Varoon Pornsinsiruk

Abstract

Phenotypic plasticity is the capacity for one genotype to alter its phenotype in response to environmental cues, resulting in different phenotypes under different conditions. Kelps, large brown algae of the order Laminariales, are known to exhibit plasticity in response to ambient water flow regimes, developing broad, high surface area blades in sheltered areas and narrow, fast-growing, hydrodynamic blades in exposed areas. Phenotypic plasticity in kelps is triggered by increased tension on the intercalary meristem (growing point) due to drag, and likely increases survival by maximizing photosynthesis in low flow and reducing dislodgement in high flow. It remains unknown, however, whether other environmental factors such as temperature may affect the capacity for phenotypic plasticity in kelps. This study determined whether phenotypic plasticity in kelps was affected by thermal stress. Optimum and stressful temperatures were determined from a thermal performance curve for *N. luetkeana* and from the literature for *S. latissima*. Calibrated weights were used to exert high and low tension on kelp blades growing at an optimal and a stressful temperature. The elongation rate and change in blade width were recorded as a measure of phenotypic plasticity. In *N. luetkeana*, the change in blade width relative to the tension applied was significantly reduced, while the capacity for plasticity in *S. latissima* was unaffected by the high temperature treatment. My results will lead to an improved understanding of how kelps respond to multiple environmental factors, and may help predict how kelp populations may respond to rising ocean temperatures.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Ocular adverse events with immune checkpoint inhibitors

Presenter(s): Tony Fang

Abstract

Immune checkpoint inhibitors (ICIs) are a rising class of drugs to treat cancers and the risk for adverse events is not well investigated. Several studies have attempted to quantify adverse events secondary to ICIs, but evidence on the risk of ocular adverse events is scant. The purpose of this study is to quantify the risk of ocular adverse events with ICIs as reported to the Food and Drug Administration (FDA). We performed a disproportionality analysis using data from U.S. FDA's Adverse Events Reporting System Database 2003 to 2018. All cases of uveitis, dry eye syndrome, ocular myasthenia and eye inflammation with use of the following ICIs: atezolizumab, avelumab, cemiplimab, durvalumab, ipilimumab, nivolumab and pembrolizumab, were included. Reported odds ratios (ROR) and corresponding 95% confidence intervals were computed for all drugs as a group or as individual agents. We identified 113 ocular adverse events for all ICI drugs of interest including uveitis, dry eye, ocular myasthenia and eye inflammation. Nivolumab had the highest number of adverse events (N=68) associated with use of the ICI. Nivolumab had the highest association with ocular myasthenia (ROR = 22.82, 95% CI [7.18 - 72.50]) followed by pembrolizumab (ROR = 20.17, 95% CI [2.80 - 145.20]). Among all ICIs approved in North America, atezolizumab had the highest association with eye inflammation (ROR = 18.89, 95% CI [6.07 - 58.81]). The results of this study suggest use of ICIs is associated with an increase risk for ocular adverse reactions. Future epidemiologic studies are needed to better quantify these adverse events.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: The Role of International Study in Leadership Skills

Presenter(s): Kimberley Huang

Abstract

International experience is important in a way that it helps students to have a broader perspective in terms of understanding different cultures better and which ultimately help develop leadership skills. This paper talks about how international experience could help to develop leadership skills and in what way it is helping specific to a variety of different skills. By studying abroad or have some experience internationally, the venture of going abroad could accelerate personal and intellectual growth, the development of cultural competency skills, and a greater understanding of the person's own culture. Different from being involved in other culture groups domestically, people who actually go abroad would have a better understanding of the reasons and history behind the culture by experiencing it on their own, that they are getting their first-hand information. International experience could also help one to understand their own culture better from others perspectives and then truly understand their leadership styles and how it applies to their own countries. Creativity and problem-solving skills would be developed from the international experience. Furthermore, perhaps one of the greatest things about studying in an international program is that a student for the first time will be able to look at their own culture from another perspective, which will help them realize the negative and positive aspects of their own culture. This allows them to work on increasing the positive aspects and decreasing the negative aspects to become a stronger leader in the future.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Prevention of Roll-Over

Presenter(s): Sofia Bandeira dos Reis, Angelene Leow, Leon Chen

Abstract

A study to identify factors of prevention of roll-over of liquid natural gas (LNG) is proposed. LNG is stored in highly insulated storage tanks at pressures slightly above atmospheric and temperature of its boiling point. Because of the heat ingress into the tank, some LNG will vaporize, hence the pressure of the container will increase. The boil-off gas that is continuously produced will be removed to maintain constant pressure and thus avoid over-pressurization. While LNG vaporizes, its more volatile components will evaporate and what is left of the LNG will be richer with heavy components. This will change the thermophysical properties of the LNG process known as weathering. In some cases, when a new stock of LNG is mixed into an old one, which had time to go through weathering, the LNG can stratify into layers and a sudden release of heat trapped in the lower layer will occur. This is known as LNG roll-over. Since roll-over can be potentially dangerous, this study aims to recognize ways of avoiding it by creating a model to analyze the heat ingress into and inside the tank.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Eunoia: Designing for Emotional Reflection

Presenter(s): Celine Hong

Abstract

Eunoia means beautiful thinking or a well mind. Importantly, it references eudiamonia: fulfillment inclusive of the joy, pain, and frustration occurring in the pursuit of something worthwhile. Instead of an idealistic notion of happiness, this is how my design re-defines what it means to be mentally well. Asking what it means to achieve good mental health drove my research towards cognitive behavioural therapy, gratitude, support networks, emotional intelligence, and behaviour change- including the pitfall of motivation and willpower. Through secondary research, conducting my own interviews, personal probes, and journey mapping workshops, I started to discover an opportunity for designed intervention. How might I facilitate the habit of mental reflection to increase personal understanding of wellness and guide an individual's journey towards improved mental health? The prototyped concept synthesizes this research into a tangible service; a wearable mood tracker functioning as a grounding tool, reminder, and accessible input for moments of emotional reflection. The device is paired with a digital platform, designed from the principles of cognitive behavioural therapy, to develop an arsenal of personalized tools for the user to become more resilient in the face of adversity.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The impact of murine gut microbiota composition on susceptibility to DSS-induced colitis

Presenter(s): Tina Madani Kia

Abstract

Introduction

Inflammatory bowel disease (IBD) is a chronic, relapsing inflammation of the digestive tract. Dextran sulfate sodium (DSS) is a chemical commonly used to induce colitis in mice in order to study the pathology of IBD. However, disease severity may be influenced by gut microbiota composition. We aim to determine whether differences in DSS-induced colitis severity exist between mice from different facilities, and different rooms in the same facility, and whether gut microbiota is involved in this process.

Methods

Three groups of seven-week old male C57BL/6 mice (n = 5 per group) from Charles River Laboratory (CRL) and four groups bred at the BCCHR animal facility (one group from Room 1, three from Room 2) were given 3% DSS in drinking water for five days and monitored for seven days after DSS was stopped. Stool samples were collected prior to DSS (day 0) and right after DSS (day 5) and analyzed using the Droplet Digital PCR System for gut microbiota differences. Body weight and disease activity scores were recorded each day.

Results

CRL mice showed increased susceptibility compared to BCCHR mice. CRL mice had increased *Bacteroides* prior to DSS compared to BCCHR mice and showed a significant decrease in *Prevotella* from pre-DSS to post-DSS while BCCHR mice showed a significant increase in *Bacteroides*.

Conclusion

Presence of *Bacteroides* was shown to play protective role but only prior to DSS treatment. A decrease in *Prevotella* throughout DSS treatment was seen in the least susceptible groups, therefore *Prevotella* depletion may also be a possible protective mechanism.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Bilingualism is associated with reorganization of frontal lobe function in 6-month-old infants

Presenter(s): Eloise Moss, Ana Ivkov

Abstract

Infants acquire language effortlessly, yet bilingual babies must adapt their language learning abilities to successfully acquire both languages. Attentional control (i.e., the ability to focus selectively and cast out unnecessary information) is one set of cognitive mechanisms supporting all infants' language acquisition. Recent work suggests that bilingualism may alter the functional brain organization of non-verbal attentional control in children and adults (Garbin et al., 2010; Arredondo et al., 2017) by showing greater activation of left frontal "language" regions, whereas monolinguals engage right frontal regions. However, there is little research regarding the developmental nature of these changes and the way in which early bilingual experience may shape infants' attentional control development. The primary aim of this study was to determine whether there are differences in the functional organization of attentional control in bilingual and monolingual infants. In order to investigate this, we used functional near-infrared spectroscopy to assess the potential differences in activation between bilingual and monolingual 6-month-old infants during a version of the Infant Orienting with Attention task. The preliminary results extend prior findings to infants. We found that monolingual and bilingual infants show different patterns of brain activation during the attentional control task. However, we found monolingual infants rely on left frontal "language" regions for non-verbal attentional control to a greater extent than bilingual infants. The results indicate that bilingualism re-organizes the brain functionally for broader, non-linguistic cognitive functions, and that these changes begin to occur early in dual-language acquisition and as early as the first year of life.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Plume dynamics of a picosecond infrared laser with applications in surgery and biodiagnostics

Presenter(s): Esther Lin

Abstract

The process of wound healing involves original tissue being replaced by scar tissue caused by an incision. Reducing tissue damage will decrease the size of the scar as well as overall healing time. In principle, lasers allow for small incisions and precise surgery, even at the single cell level. In practice, this is difficult to achieve due to shock waves and thermal damage, which are major causes for scarring. We have employed a picosecond infrared laser (PIRL) lasing at the water absorption peak of 3 μ m to excite water molecules under desorption by impulsive vibrational excitation, leading to ablation processes faster than thermal and acoustic energy transfers. This rapid process greatly reduces the amount of scar tissue produced, compared to incisions made with scalpels or electrosurgical devices. The laser ablation process consists of shock front expansions and material ejections that result in a plume. These nanosecond-long dynamics are captured using bright-field microscopy, allowing us to extract the velocity of the shockwave through images captured at different timings. By observing and characterizing plume shapes, we gain more understanding of the shock waves propagating into the tissue. This knowledge is critical for investigating the application of the PIRL in different types of tissue and surgical procedures.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Attenuating Tumor-Associated Fibrosis in Breast Cancer by Targeting Angiotensin Type-II Receptor Activity with Compound 21

Presenter(s): Anton Dugandzic

Abstract

Background: Neoplastic cells, in communication with stromal cells, most notably cancer-activated fibroblasts, initiate a reaction called desmoplasia that causes the proliferation of extracellular matrix components around the primary tumor. This collagen-rich capsule actively inhibits the effective delivery of chemotherapeutic drugs and contributes to the induction of metastasis. Desmoplasia is mediated in part by the renin-angiotensin system through angiotensin-II activation of the angiotensin type-I receptor (AT1R). Research supports that a second receptor, the angiotensin type-2 receptor (AT2R) can down-regulate the proliferative activity initiated by AT1R activation. The AT2R agonist compound 21 (C21) has not been previously studied in relation to metastasis and desmoplasia in breast cancer.

Methods: AT2R expression on human mammary fibroblasts (HMF) was visualized by immunofluorescence. The anti-fibrotic and anti-angiogenic potential of C21 were evaluated in HMFs and standard murine fibroblasts (3T3). RNA isolation and cDNA synthesis from untreated and C21-treated HMF and 3T3 cells were performed to determine the relative expression of a number of pro-fibrotic genes including PDGF, TGF-beta, FAP, FSP, SMAD3, SMAD4, and a regulatory gene, SMAD7 via RT-qPCR. Results: Expression of the AT2R on HMFs was confirmed using immunofluorescence. Treatment with C21 significantly reduced FAP and SMAD4 transcript expression in HMFs.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Changing expression of the genome without changing the genome itself; epigenetic modification mediated by polyphenols

Presenter(s): Allison Gacad

Abstract

Epigenetics is the study of heritable changes in gene expression without modification to the DNA sequence. DNA methylation, a type of epigenetic modification, primarily takes place on the cytosines of CpG sites and is catalyzed by DNA methyltransferases (DNMTs). These CpG sites are often found in promoter regions of genes; in normal cells, these genes are unmethylated and expressed. However, in cancer cells, tumour suppressor genes may be methylated and silenced, while oncogenes may be unmethylated and expressed. Some evidence demonstrates that polyphenols found in plants (grapes, blueberries) may possess anti-cancer properties, although the exact mechanisms are unknown. I hypothesize that polyphenols target oncogenes for methylation and silencing through the regulation of occupancy of two proteins at potential oncogenic regions: DNMT3b (enactor of DNA methylation) and OCT1 (transcription factor). I am analyzing chromatin immunoprecipitation data of breast cancer cells and will pursue real-time polymerase chain reaction and pyrosequencing to identify these potential oncogenic regions with changed activity in response to polyphenols.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Ace and Aro: Understanding differences in romantic attractions among persons identifying as asexual

Presenter(s): Amy Antonsen

Abstract

First characterised by Kinsey in 1948, asexuality is now defined as an absence of sexual attraction, with approximately 1% of the population found to be asexual. While asexuality research has flourished recently, few have investigated the mechanism of romantic attraction in asexuals, notably that some asexuals experience romantic attraction (romantic asexuals) while others do not (aromantic asexuals). This study compared romantic and aromantic asexuals on demographic, behavioral, psychological and physiological measures as the primary objective and compared asexuals to sexuals on some measures as a secondary aim. After combining data from seven previous studies (n = 4032 total), we found that 73.4% of asexuals reported experiencing romantic attraction. No significant difference was found in distribution of males and females between the aromantic and romantic asexual groups, though asexuals showed higher proportions of women and non-binary genders compared to the sexual comparison group. Romantic asexuals reported a diverse range of romantic orientations, with only 35.1% of romantic asexuals reporting a heteroromantic orientation, compared to 76.1% of sexuals. As predicted, romantic asexuals were more likely to have been in a relationship when completing the survey, reported more past romantic and sexual partners and more frequent kissing than aromantic asexuals, and experienced more partner-oriented sexual desire than aromantic asexuals. No difference was seen between romantic and aromantic asexuals in demographic characteristics, likelihood of having children, solitary sexual desire, physiological sexual functioning, frequency of masturbation and sexual fantasy or depression. These differences between romantic and aromantic asexuals highlight the diversity within the asexual community.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Cliff stabilizing flora on the Point Grey Cliffs

Presenter(s): Amanda Eliora, Shaun Yap

Abstract

The exposed soil along the Point Grey Cliffs are at risk of eroding given rising sea levels and heavy precipitation, endangering personnel and infrastructure that occupy its vicinity. To inform a climate adaptation cliff erosion strategy, we conducted an ecological survey of the cliffs to document species composition and structure, and to identify valuable plant species with respect to ecosystem properties, particularly slope stabilization. Data on canopy and understory species composition and densities were collected along five transects oriented perpendicular to the shoreline, running from the beach to the cliff tops. Woody species were identified, diameter breast height (dbh) measured, and stems mapped in up to five, 10 m x 15 m, plots per transect. Percent cover of understory vegetation was measured in two, 2.5 m x 2.5 m, plots within each larger plot. Presence of any species sited along the transects was recorded, along with slope angle and GPS location for each plot. On steeper slopes (gradients $\geq 30^\circ$), *Acer macrophyllum* (Big-Leaf Maple) was found to be the most common canopy species (51.3%) and *Polystichum munitum* (Sword Fern) was the most common understory species (20.7%). These may be effective candidates to stabilize the Point Grey Cliffs. Invasive species such as *Ilex aquifolium* (English Holly) were prevalent and may require management action to assist native species regeneration. This study adds to the literature on the role of flora as soil stabilizers and may inform future studies on erosion and the role of vegetation in similar environments.

WAVE 2 | ORAL PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Effects of adult hippocampal neurogenesis in mice after receiving a Single Electroconvulsive Stimulation (ECS) or Transcranial Magnetic Stimulation (TMS)

Presenter(s): Aydan Kesici

Abstract

Depression is a prevalent psychiatric disorder that affects over 350 million people globally. Convulsive therapy is a method that is used to alleviate symptoms of neuropsychiatric disorders by the induction of an electrical current. The use of both electroconvulsive stimulation (ECS) or transcranial magnetic stimulation (TMS) is effective at reducing severe symptoms of depression that do not respond to traditional drug therapies. The difference between the two, is that the ECS delivers direct electrical currents through the brain. Whereas, TMS is spatially controlled to target specific areas of the brain and create a magnetic field to stimulate the nerve cells. While convulsive treatments potentially improve symptoms of depression, the underlying neuronal mechanisms are not well-defined. To study the effects of ECS and TMS, we focused on the hippocampus. To assess the effects of convulsive treatments on hippocampal neurogenesis, we examined the timeline of therapy induced neurogenesis in a mouse model. A single ECS, Repetitive transcranial magnetic stimulation (rTMS), or intermittent Theta Burst Stimulation (iTBS) was administered, and after 1, 3, or 7 days, neural markers were examined to determine the effects of each treatment. The data indicates that ECS and iTBS increases neurogenesis immediately then declines at days 3 and 7. In contrast, rTMS did not cause changes in neurogenesis. Further analyses are underway to determine chronic neurostimulation effects on neurogenesis and morphology of the newborn neurons that are induced by the stimulations.

WAVE 2 | POSTER PRESENTATIONS

LIST | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

THEME: HEALTH AND WELLNESS

Serum zinc, copper, and selenium concentrations and interaction effects after 12 weeks of multiple micronutrient supplementation with or without iron	Jeff Holmes
Decoding the mechanisms of learning using <i>C. elegans</i> as a model system	Sebastian Wittekindt
Testing the Efficacy of Neuroprotective Approaches in Promoting Autonomic Recovery after Spinal Cord Injury	Steven Cao
How does the average torque on upper limb joints vary wheelchair user rides on flat and inclined surfaces?	Mehika Golani
Effect of donor's lifestyle on quality and storage time of red blood cells	Amy de Boer Kameron Ko Jenny Chung
Genes Are The Answer To Understanding How Patients Respond To Chemotherapy Drugs	Raveena Gowda Umaimah Zanif
Microbehaviours of rats under Oxygen and Carbon Dioxide exposure	Michelle Hung
Investigating the Effect of Maternal Genetic Factors on Severity of Fetal Alcohol Spectrum Disorder	Rhea Beauchesne Constance de Shaetzen
Inhibiting Nonparetic Area M1 in Mouse Stroke Model for Early Rehabilitative Therapy	Braydon Huynh Rebecca Tsow
Temporal and spatial pathogenesis of astrocytes and chondroitin sulfate proteoglycans in porcine spinal cord tissue following contusion injury	Tiger Zhao Sara Dalkilic

Understanding Undergraduate Perceptions of Mental Health in Relation to their Everyday Activities	Sabina Riar Irene Yang Harsimran Grewal
Repressing metastatic development through ROS toxicity	Xue Qi Wang
Fetal Transfer of Methylmercury in Humans	Alessandra Liu Rannie Lin
Recovery of a stroke in presence of Nogo-A inhibitor AT1355 using a mouse model.	Daniela Katz Amalia Urloiu Lina Losier Chaia Billan
Implementation of Prospective Outcomes Database for Patients Undergoing Pancreas Cancer Surgery	Safia Maher
Phosphate deficiency restores SDS-EDTA resistance in an Escherichia coli K12 ompC knockout mutant	Christiane Boen Faith Cheung Ian Yen
Modelling Parkinson's Disease in C. elegans	Giulio Laino
Pharmacist Management of Patients with Parkinson's Disease and the Potential for Reducing Adverse Drug Events	Kane Larson

THEME: INDIVIDUAL AND SOCIETY

Analysis of Intonation Contours in Gitksan	Rosemary Hu Sean Driscoll Alexander Fonarev
"r/Thritis", pregnancy, and parenting: A qualitative descriptive study of Reddit forums to explore information needs and concerns of women with rheumatoid arthritis	Caitlin Chew
Identifying Learning Opportunities in Pharmacy Practicum Settings	Satvir Heer

Audiovisual Speech Perception in South Asian Infants

Deepika Bajaj
Chandini Patnaik

A Scoping Review on Interventions for Perfectionism in Children and Adolescents

Linda Chen
Sarah Rosenbloom
Yvonne Nguyen
Sue Lu

Marriage Plans: A Study of Expectations of Marriage Among 19-24-Year-Old Women

Sara Chitsaz

Gaps and opportunities in the not-for-profit sector in Vancouver's Downtown Eastside: Results from an environmental scan

Grant Phillips-Hing
Jesman Punian
Guilherme Neves
Lidia Coeey-Hurtado
Jennifer Phan Anh
Bonnie Chan

Blink and You'll Miss Out! Is High Status More Visible When We Perceive Higher Economic Inequality?

Chris Astill

Preterm Mothers Unite! How do Peer Support Programs Reduce Maternal Anxiety and Maternal Stress: A Preliminary Scoping Review

Medha Nair

THEME: INNOVATION AND TECHNOLOGY

Development of human brain vessel to model Alzheimer's Disease

Emma Martin

DNA for Leukemia Treatment: An Antibody-Drug Conjugate Alternative

Bridget La Prairie
Olivia Garland
Adam Mesa
Melanie Law

Model predictive control system for autonomous sailboat in varying weather conditions.

Nicolas Navarre
Mathew Bushuru
Tyler Lum

Soil TopARgraphy: Teaching Soil Science with Augmented Reality

Daphne Liu
Sarah Bornais
Sophie Berger

The role of different pancreatic cells in tumour development

Lutfiyya Devji
Harleen Hans

Text Mining Psychiatric Clinical Notes

Rebecca Lin

How does social behavior and environment shape pronotum structure of treehoppers?

Kai von Rentzell

3D Printing Bone Scaffolds

Kinchit Joshi
Saud Lingawi
Sahil Sahibole

THEME: SUSTAINABILITY AND CONSERVATION

Bacterial Enzymes involved in Degrading Lignin Monomers

Pavneet Kalsi

The Effect of Temperature on the Motility of *Euglena gracilis*

Animisha Parmar
Apaar Chahal
Chris Lam
Kyle Chan

Relative Abundance of *Mytilus edulis* (invasive) and *Mytilus trossulus* (native) in Differing CO₂ Concentrations of Vancouver Coastal Waters

Polina Orlov

Ecotoxicological Effects of Filtered Mine Waste Drainage

Lucy Myrol

Evidence of "super-emitting" behaviour in Canadian petroleum refineries

Carlina Kim

CO₂ from flue gases - Can it be an ancillary of municipal wastewater treatment in the Yangtze River Delta?

Guramrit Bamrah
Ying Zhang

Dragonflies of the past, present, and future; how have changes in oxygen levels affected dragonfly size over time?

Jessica Schmidt
Fei Pan

Local Knowledge and Marine Sustainability in the Canadian Arctic

Kate Mussett

Novel solar pump monitor to improve sustainability of renewable energy project
with smallholder farmers in Nicaragua

Skylar Kylstra

Emily Peer-Groves

Erin Kelly

Francis Durnin-Vermette

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Serum zinc, copper, and selenium concentrations and interaction effects after 12 weeks of multiple micronutrient supplementation with or without iron

Presenter(s): Jeff Holmes

Abstract: Multiple micronutrient (MMN) supplementation may result in negative interaction effects due to competing absorptive pathways of trace elements. Our aim was to investigate the effect of multiple micronutrient supplementation with or without iron on serum zinc, selenium and copper concentrations in non-pregnant Cambodian women (18-45 y) over a 12-wk period.

In a 2x2 factorial double-blind randomized trial conducted in 2015, women received either 60 mg of iron (Fe; n=201), 14 other micronutrients including 15 mg zinc but no iron (MMN; n=202), iron plus MMN (Fe+MMN; n=206), or a placebo (n=200) for 12-wk. Fasting morning blood was collected at baseline and 12-wk from women in 26 villages in Kampong Chhnang province. A total of 760 women completed the 12-wk trial. At baseline, we observed an overall high prevalence of zinc deficiency among women (45%, based on inflammation-adjusted serum zinc <10.7 $\mu\text{mol/L}$), but no evidence of selenium or copper deficiency. At 12-wks, predicted mean (95% CI) serum zinc concentrations in the Fe, MMN, Fe+MMN, and placebo groups were 11.0 (10.9, 11.0), 12.3 (12.2, 12.4), 11.6 (11.5, 11.7), and 11.2 (11.1, 11.4) $\mu\text{mol/L}$ with a significant Fe x MMN interaction (P=0.02). The inclusion of 60 mg iron in the MMN formulation may be interfering with the absorption and/or metabolism of supplemental zinc in Cambodian women. This is of particular concern when MMN supplementation is implemented in populations with a high risk of zinc deficiency.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Decoding the mechanisms of learning using *C. elegans* as a model system

Presenter(s): Sebastian Wittekindt

Abstract: The mechanisms by which nervous systems change and adapt during learning to facilitate flexible behaviour appear to be governed by a small number of simple, beautiful rules. These adaptive mechanisms are largely conserved across nervous systems, which makes the study of simpler model organisms such as *C. elegans*, a type of roundworm, particularly useful for understanding these mechanisms. My project in the Catherine Rankin Lab involves characterizing the effect of knockout mutations of the *goa-1* gene on behaviour in *C. elegans*. The *goa-1* gene codes for a receptor protein that has been implicated in a mechanism of simple animal learning called Habituation. By studying the behavioural differences of worms afflicted by this *goa-1* gene knockout when compared with healthy worms, we can make inferences about the role of the receptor protein in the learning paradigm and apply this knowledge to other organisms. To accomplish this we collected high-throughput data of worm behaviour using the Multi-Worm Tracker technology to characterize a wide range of metrics of habituation. Our data shows a clear role of this receptor in modulating learned behaviour, though we are still in the process of illuminating the exact pathways and neurons involved. I hope to present this data and its conclusions, as well as how *C. elegans* is useful as a model organism for studying genes and phenotypes of learning.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Testing the Efficacy of Neuroprotective Approaches in Promoting Autonomic Recovery after Spinal Cord Injury

Presenter(s): Steven Cao

Abstract: Spinal cord injury (SCI) not only causes motor paralysis but also disrupts the autonomic cardiovascular control leading to autonomic dysreflexia, a condition where routine stimuli (e.g. a full bladder) can instigate life-threatening surges in blood pressure. The objective of this study was to determine the efficacy of four clinically-approved anti-inflammatory agents to protect descending sympathetic axons and improve cardiovascular function following experimental SCI. Adult male Wistar rats (n=108) received a severe contusion injury at third thoracic spinal segment, a clinically relevant injury model that causes severe autonomic dysreflexia. Each rat received an intraperitoneal injection of one of the four drugs Glyburide (10microg/kg), Fluoxetine (10mg/kg), Valproic Acid (300mg/kg) and Indomethacin (10mg/kg) beginning at either 1 or 6 hours post SCI and then at every 12 hours for 14 days. Weekly locomotor recovery was tested using Basso, Beattie, Bresnahan (BBB) scale. At one-month post SCI, terminal outcome measures included baseline blood pressure and heart rate and severity of experimental autonomic dysreflexia in response to colorectal distension. None of the drugs resulted in improvement of locomotor function, and resting hemodynamics were also not different among the groups. Finally, none of the drugs resulted in any improvement of cardiovascular function at rest or in response to colorectal distension. Histological analyses of lesion volumes are currently underway. Despite published reports on anti-inflammatory and potentially neuroprotective benefits of abovementioned drugs, all the drugs failed to show functional benefit. This study highlights the need for more rigorous reproducibility studies for promising therapeutic interventions.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: How does the average torque on upper limb joints vary wheelchair user rides on flat and inclined surfaces?

Presenter(s): Mehika Golani

Abstract: Lower limb paralysis and pain cause restrictions in mobility; therefore, the use of wheelchairs is widespread. Manual wheelchairs are the most popular due to their affordability and low maintenance requirements. They come along with one major drawback however: the strength required to pull oneself forward is moderately high and can lead to upper limb joint injuries. Without the knowledge of the threshold force that initiates injuries caused by the application of the force on the wheel, one could suffer injuries in the lower back and joints. The purpose of this study is to determine how much assistance is required for the wheel chairs to move on inclined plane and flat surfaces in order to prevent injuries that develop due to prolonged use of manual wheelchairs. Based on the results collected from 5 people using wheelchairs on different surfaces and varying distances, the force applied is dependent on the environment. It was made clear that there is a range of force that causes fatigue and leads to pain in the joints due to the input torque to the push rims. The uncertainty of range of force that instigates the discomfort is concerning as the wheelchair users' health would continue to deteriorate without a sure way to regulate required force. These findings provide an overview of upper extremity joint force involved in wheelchair use.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Effect of donor's lifestyle on quality and storage time of red blood cells

Presenter(s): Amy de Boer, Kameron Ko, Jenny Chung

Abstract: Red blood cell (RBC) transfusion is a therapeutic treatment for patients suffering from anaemia, hemorrhage, thalassemia, sickle cell disease, or other related red blood cell disorders. RBCs used in transfusions are collected from qualified donors and stored refrigerated in preservative, anticoagulant solutions. When stored, RBCs undergo various physicochemical and biochemical changes, commonly referred to as the storage lesion, which adversely affects RBC quality and function. However, there are a profusion of factors that could possibly influence the deterioration in stored RBC quality, leading to deleterious effects and decreased transfusion efficacy. The purpose of this study is to examine the effects of the donor's lifestyle on the quality and storage time of transfused red blood cells. In particular we will determine how obesity, smoking, and alcohol consumption affect red blood cell transfusion in the patient. We will perform a clinical study where RBCs from donors with varying lifestyles and certain health conditions will be transfused into a human recipient after being stored for six weeks, and then we will measure how long the blood circulates. All donors and recipients will be of the same sex and age. We predict that blood from individuals who lead healthy lifestyles will last longer compared to RBCs from an unhealthy individual, who consumes higher levels of alcohol, saturated fats, and cigarettes. The results gathered from this work will be beneficial in understanding how the prospect of personalized medicine could be used to treat individuals in the future.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Health and Wellness

Title: Genes Are The Answer To Understanding How Patients Respond To Chemotherapy Drugs

Presenter(s): Raveena Gowda, Umaimah Zanif

Abstract: Side effects of chemotherapy experienced differ between individuals. Because of the difference in the genetic code among humans, their reactions to different chemotherapy drugs differ as well. Hematotoxicity is a side effect that destroys red blood cells that can kill any patient. To investigate how the genetic makeup of a person undergoing chemotherapy influences the susceptibility to hematotoxicity, we designed a method to understand how the gene interacts with the drugs to produce such a deadly response. By looking at different experiments done on mice and humans who were exposed to chemotherapy drugs, it was found that multiple genes control how hematotoxicity is induced and that each drug influences a different gene, specifically the drugs docetaxel and doxorubicin. This investigation is therefore important in understanding which genes increases susceptibility to hematotoxicity and so this will help develop better drugs and treatment methods to treat cancer.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Microbehaviours of rats under Oxygen and Carbon Dioxide exposure

Presenter(s): Michelle Hung

Abstract: The welfare implications of CO₂ euthanasia of research animals has been questioned. Euthanasia by CO₂ involves allowing the gas to first render the animal unconscious, then letting the animal die from the extended exposure while unconscious. Studies have shown that rats experience high levels of stress far before being rendered unconscious by CO₂, and that rats wish to quickly escape from the toxic gas. However, some argue that the fleeing behaviour exhibited by rats is not a result of felt emotions, but a reflex or physiological response of the body. Researchers argue that the rats do not feel negative emotions during exposure to CO₂. To study whether rats feel felt emotions, this study examined microbehaviours of rats when placed in an unfamiliar test cage filling with CO₂ or air. A bowl of cheerios was placed in the test cage which prompted rats to leave their home cage to reach the cheerios. As the rats ate the cheerios, we observed behaviours such as attempts to exit the test cage while fitting many cheerios in their mouths and arms, eating with their bodies facing the exit and standing by the exit while eating as opposed to beside the bowl. These observable microbehaviours provide evidence that rats do feel negative felt emotions when exposed to only a few seconds of CO₂, and that without cheerios, the rats would have no desire to remain in the CO₂ environment. This study presents the need for an improved method of rat euthanasia that is more humane.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Investigating the Effect of Maternal Genetic Factors on Severity of Fetal Alcohol Spectrum Disorder

Presenter(s): Rhea Beauchesne, Constance de Shaetzen

Abstract: One of Canada's most preventable causes of developmental disability is Fetal Alcohol Spectrum Disorder (FASD), which occurs when the developing fetus is exposed to alcohol. FASD can lead to behavioural and physiological consequences throughout life, including cognitive and behavioural deficits, developmental defects and physiological abnormalities. It is understood that the amount of alcohol consumed and time of consumption during pregnancy have large impacts on the severity of FASD. Recent studies in mouse models have shown that there are genetic influences that affect the amount of cell death in the developing brain that are both strain- and region-specific. Evidence also suggests that the genetics of both the fetus and the mother can have an effect on the amount of cell death, but the extent to which each contribute is currently unknown. Using mice models, this study investigates the effects of maternal genetics on the degree of cell death in the developing brainstems of her offspring. This method of comparison is called a reciprocal cross, where the manipulation in parental genetics allows the influence of environmental and genetic conditions to be assessed in offspring. Preliminary results show that the mother's womb environment does affect the extent to which alcohol-dependent cell death occurs in the offspring's developing brain stem. The results of this study may lead to the development of innovative treatments aimed at reducing the effects of fetal alcohol exposure by considering the complex and interdependent genetic and environmental factors between mother and offspring.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Inhibiting Nonparetic Area M1 in Mouse Stroke Model for Early Rehabilitative Therapy

Presenter(s): Braydon Huynh, Rebecca Tsow

Abstract: Stroke, a condition caused by oxygen deprivation through disruption to the brain's blood supply, is a common disease that can affect one limb or side of the body. These disabilities often persist; early post-stroke rehabilitative therapy methods seem to promote compensatory reliance on the nonparetic forelimb, diminishing long-term recovery of the paretic side. Such therapy methods introduce competitive neuroplasticity by interfering with the rewiring of neural networks contralateral to the affected limb. Our study explored an alternative to current post-stroke therapy methods, whose success would revolutionize quality of life for stroke patients by prioritizing restored overall function over adapting and improving function of the unaffected limbs. A photothrombotic mouse stroke model was used to investigate the effect of fiber-optically inhibiting area M1, a region of the brain that corresponds to the nonparetic forelimb, on overall recovery of function in the paretic forelimb. Mice were given unilateral focal stroke after being sufficiently trained in completing a tapered beam walking test. Post-stroke, mice received either: a) compensatory limb training followed by paretic limb training; b) delayed rehabilitation of the paretic limb; or c) delayed rehabilitation of the paretic limb with inhibition of the non-paretic area M1. After seven days of therapy on the paretic limb, mice following treatment a) exhibited highest neurodeficit (NDS) scores for the beam walking task, whereas mice receiving treatment c) exhibited the lowest NDS scores. Our results suggest that inhibiting use of the nonparetic area M1 indirectly enhances neuroplasticity, for improved recovery of function in the paretic limb.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Temporal and spatial pathogenesis of astrocytes and chondroitin sulfate proteoglycans in porcine spinal cord tissue following contusion injury

Presenter(s): Tiger Zhao, Sara Dalkilic

Abstract: A critical challenge in spinal cord injury (SCI) research is to understand how to promote regeneration of dystrophic axons beyond the glial scar. A major factor of the glial scar's extracellular matrix that limit regeneration are chondroitin sulfate proteoglycans (CSPGs) deposited by astrocytes. Post-SCI, while elimination of CSPGs has proved efficacious, spatial/temporal localization of CSPGs and astrocytes in human is still poorly defined. In the present study, we use our porcine model of SCI to capitalize on anatomical and physiological similarities between humans and pigs to investigate CSPG and astrocyte localization in the spinal cord. Using female Yucatan pigs, a T10 contusion/compression SCI was induced. At 7 days and 12 weeks following SCI, spinal cords were harvested and processed for cryostat sectioning. Cross-sections were assessed for astrocytes (glial fibrillary acidic protein/GFAP), and CSPG's (CS-56) using immunofluorescent staining. Age/sex-matched animals subjected to similar surgery without SCI were used as controls. Immunofluorescence labeling of spinal cords from SHAM animals demonstrated a mesh-like structure of CS-56/GFAP. SCI was marked by a robust increase of CS-56/GFAP immunoreactivity expression at 7 days and 12 weeks post-SCI, compared to SHAM. This was demonstrated at the vicinity and 15mm rostral to the injury. By 12 weeks, the CSPG-GFAP meshwork increased in complexity. Increased CSPGs/astrocyte expression and changes that occur both in the center/distal sites of injury, suggest a broad inhibitory environment to regeneration for many months post-injury. Better understanding of histopathological patterns of injury will additionally advance the effective use of this model in preclinical studies.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Understanding Undergraduate Perceptions of Mental Health in Relation to their Everyday Activities

Presenter(s): Sabina Riar, Irene Yang, Harsimran Grewal

Abstract: Previous research has studied perceptions of mental health and mental illness, and how perceptions can influence help-seeking behaviors among undergraduate students, but little research has been specifically done with regards to the perception of mental health and its relation to the everyday activities among students, particularly in Canada (Laidlaw et al., 2015). World Health Organization (2004) defines mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.” This study thus aims to obtain an understanding of how students conceptualize mental health in relation with their everyday activities. Consultations will be conducted with 6 UBC undergraduate students across all year-levels and among a variety of disciplines. Consultations will be transcribed and subsequently analyzed. We expect majority of the students to know that there is a difference between mental health and mental illness (Laidlaw et al., 2015). The findings of this study and its analyses will provide information about whether there may be a need to raise more awareness about mental health specifically and what it entails. If generally true, findings may give rise to new ideas about the ways in which professionals and students alike can raise more awareness across campus, and the strategies in which they can promote mental well-being in specific areas. It may also help provide new understandings of where support may be needed most.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Repressing metastatic development through ROS toxicity

Presenter(s): Xue Qi Wang

Abstract: Cancer typically arises from mutations which lead to uncontrolled cell proliferation, and culminates in invasion of adjacent tissues and metastatic dissemination to distant organs. Such ectopic behaviour usually results in increased reactive oxygen species (ROS) as a consequence of heightened energy requirements and/or stress from distinct microenvironments during metastasis. Although many malignant cells die of ROS toxicity, cells which can adapt and maintain redox homeostasis have a high potential for metastatic development. Our research on bone cancers, Ewing and osteosarcoma, aims to identify key stress-adaptation mechanisms of therapeutic potential.

Oxidative stress is known to induce stress granules (SGs), which are cytoplasmic aggregates of RNA and RNA binding proteins. We found SG formation to be a novel protective mechanism, whereby the sequestered mRNAs are translationally silenced, allowing for selective translational-enhancement of cytoprotective proteins, including Nrf2—the master antioxidant response regulator. We then performed drug screens followed by immunofluorescence and immunoblotting, and found that MS-275 potently inhibits SG formation, decreases Nrf2 induction, increases ROS, and enhances apoptosis under stress, without affecting cell proliferation in ambient conditions. In mice bearing sarcoma xenografts, MS-275 blocked local sarcoma invasion, and dramatically inhibited lung metastases.

These data suggest an exciting new strategy to target metastatic development through SG inhibition, which reduces the adaptive capacity of sarcoma cells to oxidative stress. As oxidative stress is also implicated in neurodegenerative, cardiovascular, and metabolic illnesses, further elucidation of adaptation mechanisms to ROS can have widespread impacts on treating cancers and a diversity of additional diseases.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Health and Wellness

Title: Fetal Transfer of Methylmercury in Humans

Presenter(s): Alessandra Liu, Rannie Lin

Abstract: Methylmercury, a poisonous form of organic mercury, is widely present in ocean ecosystems and ultimately consumed by humans. Understanding the process of methylmercury transfer from mother to fetus is crucial, as the accumulation of methylmercury may result in neurological disorders such as psychomotor retardation and seizures in children. We conducted literature review and data analysis, and further applied the biokinetic model to calculate the partitioning coefficients at steady-state for the mother-fetus methylmercury transfer process. Our findings show that the concentration of methylmercury in the fetus is significantly higher than that of its mother, especially in the brain. The pattern of distribution of methylmercury in the fetus as well as the relationship with gestational age should be further investigated.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Recovery of a stroke in presence of Nogo-A inhibitor ATI355 using a mouse model.

Presenter(s): Daniela Katz, Amalia Urloiu, Lina Losier, Chaia Billan

Abstract: Stroke is the primary cause of physical impairment and third major fatality risk for adults in Canada, but there are still few available therapies for stroke. Axonal rewiring is a natural process which proceeds a stroke, where alternate neural pathways are strengthened to overcome the lesions caused by the stroke. The protein Nogo inhibits this type of recovery, resulting in a more inefficient response to treatment. Inhibiting Nogo could provide to be an effective alternative to existing pharmaceutical treatments. Transgenic mice lacking the Nogo gene were used as a point of comparison to regular mice in order to assess the extent of the effect of the treatment. Mice were pre-trained motor skill tests (ledger tapered beam test and pasta test) to compare initial ability with ability after stroke and recovery, as well as original limb bias. After inducing a localized ischemic stroke to the motor cortex (Endothelin-1 model), half the regular mice and half the transgenic mice were treated with the Nogo-inhibiting drug (ATI355), administered intrathecally, while the untreated transgenic and regular mice were used as a control. Mice repeated the pre-trained motor skill tests. The results indicate ATI355 decreased recovery times, particularly in regular mice. Transgenic mice that received treatment may have had a smaller reduction in recovery time due to the nerve growth factor stimulants in the drug that contribute to neuron rewiring and recovery. Humans cannot be transgenic like mice, therefore understanding the effectiveness of ATI355 is relevant in treating human stroke patients.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Implementation of Prospective Outcomes Database for Patients Undergoing Pancreas Cancer Surgery

Presenter(s): Safia Maher

Abstract: Approximately 50 patients undergo pancreas cancer surgery for adenocarcinoma at Vancouver General Hospital (VGH) annually, with additional surgery for other indications. Surgical intervention is an opportunity to extend survival for pancreas cancer patients, who face very low long-term survival rates. With such a significant number of patients affected per year, it is crucial to review practice in pancreas cancer surgery to improve outcomes. However, due to the lack of a process to reliably track patient outcomes at VGH, chart review and analysis of practice has been minimal and inconsistent. As such, we were unable to launch quality improvement and control initiatives for this at-risk group.

We proposed a prospective database using REDCap data collection tool as a comprehensive and reliable solution. The database has since been implemented to test its feasibility. Prospective data is collected from chart review to track perioperative factors. Thus far, the database has successfully tracked all of the pancreas cancer cases since October 2017 and has proven to be a simple and reliable way of reviewing practice and outcomes. The database has shown great promise for: a) informing patient care improvement measures; b) facilitating collaboration among multiple disciplines involved in pancreas cancer care at VGH and broadly across British Columbia; and c) providing opportunity for feedback on surgeons' performance at VGH.

Because our database has proven to be an integral way to support quality improvement and control initiatives for pancreas cancer patients, we hope to eventually integrate the database into standard of practice at VGH.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Phosphate deficiency restores SDS-EDTA resistance in an *Escherichia coli* K12 ompC knockout mutant

Presenter(s): Christiane Boen, Faith Cheung, Ian Yen

Abstract: The asymmetric outer membrane (OM) of gram-negative bacteria protects against external insults, such as antibiotics and detergents. OmpC, an OM general diffusion porin of *Escherichia coli*, interacts with components of the Mla pathway to maintain OM asymmetry. Previous studies have shown that *Escherichia coli* Δ ompC knockout strains are sensitive to treatment with sodium dodecyl sulfate (SDS) and ethylenediaminetetraacetic acid (EDTA) compared to wild type. PhoE is a general diffusion porin that is similar in structure and function to OmpC, but normally expressed only under phosphate-deficient conditions. We hypothesized that phosphate deficiency would restore SDS-EDTA resistance in Δ ompC mutants by inducing PhoE expression, which could compensate for OmpC in terms of maintaining OM asymmetry. To test this, we performed growth assays of wild type and Δ ompC mutant strains grown in phosphate-sufficient or phosphate-deficient media with increasing SDS-EDTA concentrations. Our study found that the Δ ompC mutant strain is resistant to SDS-EDTA when grown in phosphate deficient media compared to phosphate-sufficient 24 media. SDS-PAGE was used to investigate the expression of PhoE in phosphate-deficient media. Our results suggest that phosphate deficiency results in changes in global protein expression and restores SDS-EDTA resistance in *Escherichia coli* Δ ompC strains.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Modelling Parkinson's Disease in *C. elegans*

Presenter(s): Giulio Laino

Abstract: Parkinson's disease (PD) is a neurodegenerative disorder that affects motor systems. In humans, about 10 million people are affected world-wide: Cases are sporadic for the most part, but around 15% of the affected patients have a family history. It is the latter category of the PD population that we are interested in investigating. We are using the strength of *Caenorhabditis elegans* (*C. elegans*) as a model system to augment our knowledge concerning the genes associated with PD. *C. elegans* is a nematode that has been used as a model organism for a number of neurological diseases, for it lends itself well to genetic and molecular manipulation, costs are contained, and analysis time is rapid. My project elucidates the effects of four human genes associated with PD on *C. elegans* behaviour: RAB32, VPS35, LRRK2, and RME8. Using standard molecular biology techniques, transgenic animals are made, and the genes of interest are tagged with a fluorescent protein (GFP) to visualize neurons that express these genes. Subsequent behavioural testing of wild-type and mutant nematodes expressing the human genes will determine whether there are any behavioural differences, particularly those associated with PD, e.g., alterations in related behaviours, augmented stress, and motor impediments. Importantly, because these PD-associated genes are conserved, we will observe whether motor behaviours can be rescued by expressing the human genes in the nematode neurones. Therefore, by understanding what these genes are doing to the neurones and how, we hope to identify novel targets for therapeutic treatments that can ameliorate PD symptoms.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Pharmacist Management of Patients with Parkinson's Disease and the Potential for Reducing Adverse Drug Events

Presenter(s): Kane Larson

Abstract: Patients with Parkinson's disease (PD) who visit the Pharmacist Clinic clinics are extremely prone to adverse drug events. The study is aimed at tackling the value of pharmacist interacting with patients at the The Clinic, which, is a university affiliated patient care clinic. Pharmacists provide comprehensive medication management and have a significant role to play in optimizing care for this patient group. However, there is a lack of data examining the role of pharmacists in the care of patients with PD. A retrospective review of patients with PD who were assessed by a pharmacist at the UBC Pharmacists Clinic (the Clinic) from November 12, 2013 to July 31, 2018 was conducted. A total of 131 PD patients were examined for key characteristics such as chief complaint, demographics, prescription and non-prescription medication, recommendations made by pharmacist, drug therapy problems, and pharmacist actions to resolve therapy problems. PD patients visiting the Clinic were on average taking 5.8 prescriptions and 3.2 non-prescriptions. Approximately 41% lived outside of the Metro Vancouver District Region, where the Clinic is located, representing the geographic diversity of patients seeking care outside of their usual care environment. At first encounter with the Clinic, the most common chief complaint was PD management (38%) and the most common recommendation was related to motor symptom control (37%). Within a 16 month period, pharmacists identified 165 drug therapy problems, equating to an average of 1.3 per patient. The most common recommendation to resolve a drug therapy problem was to change a prescription medication (30%). Patients with Parkinson's disease seeking pharmacist consultation are complex due to having more than 1 drug therapy problems, and are likely to benefit from dedicated pharmacist services.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Analysis of Intonation Contours in Gitksan

Presenter(s): Rosemary Hu, Sean Driscoll, Alexander Fonarev

Abstract: Intonation can be regarded as the rise and falls in pitch in a segment of spoken language. Different sentences have different kinds of intonations. For example, in English, yes-no questions have rising intonation. Gitksan is an endangered indigenous language spoken in Northern BC, and regarding intonation of yes-no questions in Gitksan, not much research has been done. Tarpent's (1987) work on Nisgha, a language closely related to Gitksan, has found no signs of differentiation between statements and yes-no question intonation (p. 149). Rigsby, who also worked on Gitksan, did not find any difference between statements and yes-no questions intonation contours. According to Rigsby, yes-no questions in Gitksan are marked by a question suffix and there is no change in intonation from statements (p. 296).

We have potentially found evidence to suggest otherwise, and accordingly have decided to look into yes-no intonation in Gitksan. Specifically, we will be looking at whether or not there are patterns of intonation rising at the end of a Gitksan yes-no question. In order to observe the presence or lack of this phenomenon, we decided to analyze tokens we collected in an application that is commonly used for intonation analysis: Praat.

Our prediction is that there will be a contrast between yes-no questions and statements. The purpose of our project will be to extend this qualitative research into the expanding body of research on Gitksan intonation.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: "r/Thritis", pregnancy, and parenting: A qualitative descriptive study of Reddit forums to explore information needs and concerns of women with rheumatoid arthritis

Presenter(s): Caitlin Chew

Abstract: Arthritis encompasses over a hundred different inflammatory conditions which are collectively the leading cause of long-term disability, pain, and health care utilization. The most prominent is rheumatoid arthritis (RA), which tends to be more prevalent among women than men with a ratio of nearly 3 to 1. As the Internet is increasingly used by patients with chronic conditions to seek and share information, our objective was to conduct a qualitative descriptive study of posts on the social news website, Reddit, to understand the information needs of women with arthritis regarding pregnancy and parenting. We searched posts on three subreddit sites r/Thritis, r/Rheumatoid, and r/BabyBumps over a 10-year period. We identified 87 posts and included 59 posts for qualitative analysis. Through content analysis we identified 5 themes and corresponding categories: 1) finding a community; 2) making decisions about pregnancy and having children; 3) worrying about the impact of arthritis on pregnancy and parenting; 4) information needs on managing arthritis throughout the perinatal period; and 5) seeking pregnancy information and resources for arthritis. Qualitative analysis of posts about arthritis, pregnancy and, parenting shows that women with arthritis sought information about disease management before, during, and after pregnancy. However, the anonymity of Reddit leads to the lack of demographic and disease information about users. Thus, we cannot be certain of users' diagnosis or that they truly have arthritis. Altogether, findings speak to the importance of supporting the information and support needs of women with arthritis who are considering or planning pregnancy.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Identifying Learning Opportunities in Pharmacy Practicum Settings

Presenter(s): Satvir Heer

Abstract: The goal of this study is to identify, through individual interviews with students, the situations and conditions conducive to learning in Pharmacy practicum settings. This topic is important because of the recently increased accreditation requirements for experiential education to 42 weeks, while many students enter the program without relevant practice education experience. Thus, it is important to provide support for student learning in practicum settings. Identifying opportunities for learning is the first step in building the necessary supports. The research questions were:

- (1) What are the practicum situations and conditions conducive to effective learning?
- (2) Are there differences in learning: between academic and practicum setting, across years and types of practicum settings (hospital and community)?

Nine students from all years of the UBC Pharmacy Program were selected through stratified purposeful sampling and individually interviewed about their learning experiences during their summer practicum through a qualitative interview method. Data were analyzed through an ongoing process of data summarization, transcript coding, and content analysis. The practicums were described as conducive to acquiring interprofessional skills, self-assessment skills and feeling of self-efficacy. New knowledge acquisition was embedded in the care for patients and required self-directed learning skills. A "learning script" (a routine sequence of actions thought of as leading to efficient learning) emerged from the participants' descriptions (in both hospital and community settings). The script included a trigger (e.g., preceptor assigned task) and a sequence of common iterative steps of preparation (e.g., collecting information), patient interaction cycle, planning ahead (e.g. follow-up/new cycle). The practicums were described as conducive to acquiring interprofessional skills, self-assessment skills and feeling of self-efficacy. New knowledge acquisition was embedded in the care for patients and required self-directed learning skills. A "learning script" emerged from the participants' descriptions of the situations and conditions conducive to learning in both hospital and community settings. The script included a trigger (e.g., preceptor assigned task) and a sequence of common iterative steps of preparation (e.g., collecting information), patient interaction cycle, planning ahead (e.g. follow-up or a new cycle).

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Audiovisual Speech Perception in South Asian Infants

Presenter(s): Deepika Bajaj, Chandini Patnaik

Abstract: Speech perception in infants is a multisensory process: infants use auditory and other modalities including vision to acquire speech (Danielson, Bruderer, Kandhadai, Bateson, & Werker, 2017). Furthermore, past research has shown infants' ability to distinguish sounds regardless of their prior experience with those specific sounds. For instance, infants younger than six months of age are able to discriminate the dental [d̪] vs. retroflex [ɖ] in the Hindi language, even if they are not growing up with Hindi and hence are not hearing the distinction. In a pattern called perceptual attunement, discrimination of minimally different non-native speech sounds declines from six months to one year of age (Werker & Tees, 2002), whereas discrimination of native speech sound differences improves. Additionally, infants can match phonetic information to lips and voice, and this is seen in babies as young as two months (Patterson & Werker, 2002). However, it is not understood whether infants with prior experience with a language are better able to detect a mismatch in vocal and lip presentation. Thus, our research asks whether infants hearing Hindi are better able to detect a mismatch than those hearing English. We predict a correlation between looking time to the mouth over the eyes in the first phase and longer looking to alternating trails compared to non-alternating trails in the test phase. This study will advance our understanding of how language experience and multisensory speech perception interact in influencing perceptual attunement.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: A Scoping Review on Interventions for Perfectionism in Children and Adolescents

Presenter(s): Linda Chen, Sarah Rosenbloom, Yvonne Nguyen, Sue Lu

Abstract: Perfectionism is a pernicious personality style characterized by the intense fear of failure, harsh self-criticism, and excessive high standards for oneself and others. When demands for perfection are unmet, perfectionistic individuals will experience abject shame, guilt, distress, and hopelessness. Previous studies have linked childhood perfectionism with a wide range of psychopathological conditions, adjustment difficulties, increased suicide risk, and poorer treatment outcomes. Given the clinical relevance of perfectionism in children and adolescents, it is alarming that there is a lack of research on treatment for childhood perfectionism. As such, we have conducted a scoping review by using a systematic method to synthesize studies and map out the current knowledge available on treatments for perfectionism. In our review, we examined five empirical studies that directly examine treatment of perfectionism in children and adolescents. The two treatment methods employed in these studies were Cognitive Behavioural Therapy (CBT) and Adlerian Play Therapy (AdPT). CBT was found to be effective in decreasing self-oriented perfectionism (demands for oneself to be perfect), but less effective in reducing socially-prescribed perfectionism (the perception that others demand perfection from the self). Contrarily, the effectiveness of AdPT in treating perfectionism was weakly supported, and the study using AdPT had limited generalizability. Although CBT shows preliminary evidence for treatment of perfectionism in children and adolescents, further research is needed to replicate such findings to develop evidence-based interventions. Additionally, future investigation into the effectiveness of various forms of therapy (e.g., individual, group, or family-based) can shed light on best-practices for treating childhood perfectionism.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Marriage Plans: A Study of Expectations of Marriage Among 19-24-Year-Old Women

Presenter(s): Sara Chitsaz

Abstract: As the landscape of expectations placed on young women changes alongside the evolution of family and marriage as institutions (such as the increasing divorce rates), there is a gap in sociological discourse on women's perceptions of their own expectations of marriage and what they believe impact these expectations. This study aims to address the question of how 19-24-year-old women perceive marriage and articulate their own expectations around marriage. Data collection for this study involved six semi-structured interviews with women in this age range who live in Vancouver, BC. With this study, I hope to expand on the existing, largely quantitative, body of knowledge surrounding the perceptions and expectations young women have by providing a nuanced analysis based on rich data from qualitative research. The goal of this project is to develop an analysis of what aspects of women's social locations and socialization (such as their education level and where they grew up) they feel have influenced their personal marriage expectations (i.e. whether they expect household labour associated with marriage to be divided based on traditional gender roles) and perceptions. While the results of this study will not be generalizable to the broader population, it may provide a starting point for further discussion on the individual experiences women have with the topic of marriage.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Gaps and opportunities in the not-for-profit sector in Vancouver's Downtown Eastside: Results from an environmental scan

Presenter(s): Grant Phillips-Hing, Jesman Punian, Guilherme Neves, Lidia Coeey-Hurtado, Jennifer Phan Anh, Bonnie Chan

Abstract: The Downtown Eastside (DTES), the oldest neighborhood in Vancouver, British Columbia, has high rates of poverty, public health issues, and other inequities that affect people facing some of the most stark marginalization in the country. While various programs and initiatives have been implemented by governments, community-lead organizations, and health services, persistent issues in areas such as housing, addiction, and mental illness call for a broader framework of strategic partnerships. Among key service providers are not-for-profit organizations, which constitute a growing sector undertaking increasingly important roles in community development. Yet, coordination is limited within and beyond the sector, as evident in the lack of a comprehensive record of these organizations and their services. Without a comprehensive record, people who live in the DTES and service providers who support this neighbourhood are limited in their ability to draw on these supports. As such, this study collated information on not-for-profit organizations that are located in and serve the DTES population, and examined prominent trends in the sector. This study employed an environmental scan - a systematic and comprehensive search - of the non-profit organizations that serve the DTES population. We then conducted a thematic analysis of the organization's mission and mandate and target population to identify opportunities and challenges confronting these organizations, and neighbourhood trends in service provision. Findings of this thematic analysis reveal key gaps in who is best-served by not-for-profits in the DTES, and can support service providers and stakeholders to better serve the needs of the DTES Community.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Blink and You'll Miss Out! Is High Status More Visible When We Perceive Higher Economic Inequality?

Presenter(s): Chris Astill

Abstract: Past research suggests that higher economic inequality increases peoples' concern about their own status. This could mean that people become more worried about losing status in the eyes of others when economic inequality is high. The rationale for this idea is that, as inequality increases, the difference between the rich and the poor increases and therefore people stand to lose more if their relative standing in society decreases. If this is the case then it could have many important implications. For example, people may be more likely to react with violence to a status threat, such as being ridiculed in front of others. This current research aims to test whether perceiving higher levels of economic inequality leads to greater attention to words that imply high status. 200 university psychology student participants performed an attentional blink (AB) task both before and after viewing a video manipulation depicting economic equality in our society as either equal or very unequal. The difference in accuracy for identifying high status versus neutral target words before and after the video was used as a measure of attentional bias. This study aims to better understand factors affecting selective attentional tuning to indicators of high status.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Preterm Mothers Unite! How do Peer Support Programs Reduce Maternal Anxiety and Maternal Stress: A Preliminary Scoping Review

Presenter(s): Medha Nair

Abstract: Purpose: Premature births are often stressful experiences for expectant parents and can have adverse effects on both the mother and infant. Several studies have demonstrated that the mother-infant relationship can be impacted by maternal anxiety and maternal stress. In effort to improve these outcomes, peer support programs have been administered to preterm mothers. Relatively little research to date has examined how peer support programs can reduce maternal anxiety and maternal stress.

Problem: This research seeks to understand how online and in-person peer support programs can improve maternal wellbeing.

Methodology: A scoping review will be conducted using the Joanna Briggs Scoping Review Methodology. A comprehensive literature search will be conducted in MEDLINE. A title and abstract scan and a full-text review will be used to determine the eligibility of articles. Studies will be assessed for eligibility using pre-determined criteria. All articles will be reviewed independently by both review authors. Both review authors will extract data from all eligible articles using a standardized form.

Results: This poster will present findings from a preliminary scoping review. This review will synthesize how peer support programs can help to reduce maternal stress and maternal anxiety.

Implications: Findings from this review can be used to implement effective peer support programs aimed at improving maternal wellbeing.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Development of human brain vessel to model Alzheimer's Disease

Presenter(s): Emma Martin

Abstract:

BACKGROUND/OBJECTIVE

The neurovascular unit is a complex, interdependent system composed of neurons, neural-supporter cells, namely astrocytes, and vascular cells, including endothelial cells (EC) and smooth muscle cells (SMC). Currently, our use of static culture conditions and limited cell types does not allow studies of vascular physiology, particularly under flow conditions that mimic blood circulation through the vessel lumen. Using tissue engineering technology, we have developed a 3D physiologically relevant model of human cerebral arteries composed of ECs, SMC and astrocytes. Our objective is to engineer human induced pluripotent stem cell (iPSC)-derived neurons within this innovative platform to generate the first human functional model of the neurovascular unit.

METHODS

Primary human EC, SMC, astrocytes and human iPSC-derived neurons is cultured on a polyglycosic acid/polycaprolactone scaffold under pulsatile flow conditions to generate bioengineered cerebral arterial neurovascular units that mimic human CNS arteries 2 mm or less in diameter. Using histology, we confirm the correct anatomical organization of our tissue and validate this model through studies of EC, SMC, astrocyte and neuron key cerebrovascular functions.

RESULTS/CONCLUSION

Using this model, we demonstrated that over a course of two weeks ECs of peripheral origin (HUVEC) acquire specific cerebral tight junctions and blood-brain barrier transporters when cultured in the presence of astrocytes with expression levels similar to native cerebral tissues. Immunofluorescent staining confirms that neurons form multilayers in close proximity to the astrocytes and that they are positive for synapsin. We measured beta-amyloid secretion in the media and the tissue, also supporting neuronal functionality.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: DNA for Leukemia Treatment: An Antibody-Drug Conjugate Alternative

Presenter(s): Bridget La Prairie, Olivia Garland, Adam Mesa, Melanie Law

Abstract: Over the past few years, many novel cancer treatments have made their way into the physician's toolbox, including antibody-drug conjugates (ADCs). Using an antibody, the drug is able to selectively target specific surface proteins expressed on cancer cells, thus delivering drugs with greater precision. The benefit to these therapeutics is that they can deliver higher doses of chemotherapy with less side effects. ADCs still have some significant problems, particularly with the attachment of the drugs to the antibody.

This year, our team worked to create a DNA nanotechnology-based version of ADCs to target acute myeloid leukemia (AML). Our drug delivery vehicle is a self-assembling DNA tetrahedron. Instead of using antibodies, we used an aptamer to target CD33, a receptor that is overexpressed on AML cells. Doxorubicin, the chemotherapy drug to be delivered, was incubated with the tetrahedron and allowed to intercalate between the DNA strands, bypassing the complex conjugation chemistry required for ADCs. The ultimate goal is to deliver doxorubicin exclusively to AML cells using our structure.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Model predictive control system for autonomous sailboat in varying weather conditions.

Presenter(s): Nicolas Navarre, Mathew Bushuru, Tyler Lum

Abstract: This project aims to create a robust control system for a fully autonomous sailboat, which is modeled by a predictive framework. By predicting the motion of the hull, adjustments in the controls can be made to keep the heading of the boat in the direction specified by its local pathfinding. The boat's equations of motion are given by its fluid dynamics in the air and water, all of which are modeled by non-linear differential equations. The challenge in creating this model is to identify an appropriate control setpoint, and to linearize the equations of motion, so that it can be implemented in a MATLAB model predictive control toolbox. With a complete model and controller, boat dynamics and weather simulations can be made using Gazebo physics engines and a Robot Operating System (ROS) communication framework. This allows for improved visualization and testing of the hull's motion under varying weather conditions and control settings. Our end goal is to create a robust sailboat control system that will control a fully autonomous sailboat through 2300 nautical miles of the Pacific Ocean in the Victoria-Maui Yacht race.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Soil TopARgraphy: Teaching Soil Science with Augmented Reality

Presenter(s): Daphne Liu, Sarah Bornais, Sophie Berger

Abstract: There were three study objectives of the project. First, we developed mobile app “Soil TopARgraphy” to help students learn about the effects of topography on formation of different soil types through an immersive, visual Augmented Reality (AR) terrain. Next, we sought to evaluate students' knowledge of use of AR in education. Finally, we aim to assess students' satisfaction with the app in April 2019.

AR overlays digital enhancements on top of existing reality. Different soil orders are shown on a real-life AR terrain. We selected an area north of Kamloops, British Columbia, characterized by diverse soil types, and built a terrain model. This app brings interactivity to the lectures and laboratory sessions, promoting student engagement and deeper comprehension of the material. Students can view terrain overlaid by elevation markers and satellite images then read about different soil orders, view images, and take a self-study quiz to reinforce their understanding.

To understand the use of AR in postsecondary education, we conducted an online survey with 47 students enrolled in some soil science courses. We found that 95% of students have not had AR in any of their courses; however, 89% were interested to have AR as part of their courses.

After a year of development, the app can be downloaded through Google Play and soon on Apple App Store. It was presented at the International Soils Meeting held in San Diego, CA in January 2019 and will be officially launched and used by 250+ students in APBI 200 starting March 2019.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: The role of different pancreatic cells in tumour development

Presenter(s): Lutfiyya Devji, Harleen Hans

Abstract: The pancreas consists of two main cell types in its exocrine compartment. Acinar cells, that secrete digestive enzymes and ductal cells that transfer them into the duodenum. Pancreatic ductal adenocarcinoma (PDAC), one of the deadliest type of cancers, is associated with a series of precancerous lesions. Pancreatic intraepithelial neoplasia (PanIN) is one of the most common types of precursor lesions with three different stages; PanIN-1, PanIN-2, and PanIN-3. As PDAC has a histological similarity to ductal cells, it has been thought to arise from ductal cells. However, using genetically engineered mouse models, PDAC has been found to be driven from both acinar and ductal cells.

We hypothesize that both cell types will cause PDAC but the progression of PDAC will differ. To better understand the role of cell of origin in PDAC and PanIN formation, we used different genetically engineered mouse models with mutations in Kras and the p53 gene to distinguish between acinar-derived tumor and ductal-derived tumor histology and phenotype. In this study, the ductal mice developed tumours quicker, and had relatively shorter lives compared to the acinar models. In addition, ductal mice displayed higher grade lesions, while the acinar mice had a range of low to high grade mucinous glandular PanINs. From these findings, it was concluded that both ductal and acinar cells contributed to the formation of PDAC. However, acinar cells with the same mutations as ductal cells, took longer to develop lesions and therefore initiate the development of PDAC.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Text Mining Psychiatric Clinical Notes

Presenter(s): Rebecca Lin

Abstract: The Child and Adolescent Psychiatric Emergency (CAPE) unit at BC Children's Hospital provides emergency intervention and stabilization for youth in psychiatric crises. At admission and discharge, patients receive extensive diagnostic assessments largely recorded as free-text clinical notes. The reports are difficult to incorporate in large-scale analyses, as manual information extraction is laborious and prone to error. Hence, our study explores applications of text mining in extracting accurate, structured data from psychiatric clinical records. We aim to develop an automated data extraction pipeline to distill clinically relevant information from CAPE records, and, ultimately, apply the extracted data in developing machine learning algorithms to predict patient suicidality.

Our preliminary dataset consists of 1559 clinical records. We first programmatically de-identified each text and performed section segmentation, sentence tokenization, and stop word removal to clean the records. Then we detected medical entities, including symptoms, diseases, diagnoses, and medications, through retrieving ontology-based annotations from a local implementation of the National Centre of Biomedical Ontology (NCBO) BioPortal. Lastly, we adapted context-detecting algorithms to determine the negation, experiencer, and temporal status for each extracted terminology. For evaluation and optimization, study results will be compared to an existing repository of annotated patient records from CAPE.

Thus far, our investigation indicates that text mining could be an effective tool in analyzing psychiatric clinical notes. Through automating the data extraction processes at CAPE, our project will be able to produce the structured information researchers need to conduct large-scale analyses, generate patient statistics, and construct predictive models in support of pediatric mental health.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: How does social behavior and environment shape pronotum structure of treehoppers?

Presenter(s): Kai von Rentzell

Abstract: Treehoppers (Hemiptera: Membracidae) have evolved immense morphological diversity in their pronota, a thorax structure found in all insects. However, many questions remain surrounding the diversification of the pronotum. We hypothesized that the pronotum shape is linked to their local environmental conditions as well as their behavioral strategies, where some are solitary, exhibit maternal care (i.e. subsocial), or show mutualistic interactions with ants. To test this, we used museum specimens consisting of around 200 species of treehoppers found across a 4000 meter elevational gradient in Ecuador. For each species, their occurrence was recorded with 500m intervals, and their pronotum complexity (i.e. perimeter to area ratio) was measured using photographs taken from the dorsal view. We found that solitary treehoppers exhibited the most and least pronotum complexity. Subsocial and mutualistic treehoppers showed intermediate, and low levels of complexity respectively. The large variation in complexity seen in solitary treehoppers may be attributed to their diverse behavioral strategies used to avoid predation, such as fleeing, favoring simple pronota, or crypsis, linked to complex pronota. The intermediate complexity seen in subsocial treehoppers may be affiliated with the presence of defensive spines. Low complexity seen in mutualistic treehoppers may be a result of pronotal functions (e.g. defense) being substituted by ants. We are still exploring other morphologic properties of treehopper pronota, which may further elucidate its adaptive value in the context of behavior and environment.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: 3D Printing Bone Scaffolds

Presenter(s): Kinchit Joshi, Saud Lingawi, Sahil Sahibole

Abstract: According to the United Nation's Population Division, the number of people aged over 60 will increase from 841 million in 2013 to 2 billion by 2050. The number of people at risk of orthopedic ailments will also rise during that time. This project aims to find a viable alternative to current bone grafts using additive manufacturing (AM), as there is a rising requirement for bone grafts that meet the personalized needs of the patient. The current standard procedures with bone implants are either using cadaver bones or a fragment of the patient's hip bone. However, cadaver bones have reported high rates of post-op infection and extracting bone from the hip is a painful process with potential implications on patient mobility. This research investigates several geometries that could best replicate the mechanical properties of bone.

Structural designs that achieved high load bearing capabilities and promoted cell generation and migration in the bone were created of polylactic acid (PLA), with diameters and heights of 30 and 60 mm, respectively. For the design of the interior porous structure, we chose the porosity of 70% which was similar to natural bone. Three structural designs were considered based on literary research: tetrahedral truss, octet truss and diamond-TPMS (Triply Periodic Minimal Surface).

Three samples of each design were 3D printed and tested. The tetrahedral structure showed the highest Young's modulus and yield strength. However, failure occurred layer by layer with an undulating stress-strain curve, which is not ideal. The d-TPMS structures provided an optimal combination of high mechanical properties and predictable post-yield behavior, making it a better option for this application.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Bacterial Enzymes involved in Degrading Lignin Monomers

Presenter(s): Pavneet Kalsi

Abstract: Lignin is a complex heterogeneous aromatic polymer that makes up 15-30% of the biomass of plants and resides in close proximity with cellulose and hemicellulose [1]. Due to the diversity of inter subunit linkages, lignin is exceptionally difficult to breakdown- hence defined recalcitrant. Valorization (conversion into higher value compounds) of lignin is essential for sustainability of bio-refineries and could result in the production of biofuels and other chemical products such as lubricants or cosmetics [2]. In addition, the generation process of organic biofuels have the potential to replace petroleum- a major contributor to the production of greenhouse gases that have a negative effect on the environment during production. The focus of this project is to produce and purify enzymes found in soil bacterium that have the capability to utilize lignin monomers as an energy source. Previous reductive catalytic fractionation [3] identified a cytochrome P450 and a phenol hydroxylase (HpaB) enzymes that appear to be involved in the initial steps of lignin mono-aromatics through the meta cleavage pathway. Genes encoding these enzymes, and their respective reductases, were cloned into vectors for overexpression in *Escherichia coli* and *Rhodococcus jostii* (RHA1), which will be used for complementing gene deletion mutants in in-vitro assays to help validate the enzymatic functions. In addition, preliminary overexpression experiments were done to identify the conditions to produce the enzymes to ultimately elucidate and resolve their structure via purification. This work expands our knowledge of bacterial catabolism of lignin derived aromatic compounds and provides additional genes for strain engineering.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: The Effect of Temperature on the Motility of *Euglena gracilis*

Presenter(s): Animisha Parmar, Apaar Chahal, Chris Lam, Kyle Chan

Abstract: This study investigated the effect of temperature on the motility of *Euglena gracilis*, a protozoan consumed by salmon fry in the Pacific Northwest (Chittenden et al., 2010). A culture of *E. gracilis* was divided into four groups of test tubes and incubated at different temperatures (11°C, 17°C, 27°C, 34°C) for 60 mins. After incubation, the swimming speed of *E. gracilis* was measured under a compound microscope using a Dino-lite eyepiece camera. The results obtained, displayed a trend wherein the rate of forward swimming for *E. gracilis* increased as temperature increased up until 27°C. As temperature surpassed 27°C the rate of forward swimming began to decline. A one-way analysis of variance (ANOVA) resulted in a p-value of 1.64×10^{-8} indicating statistically significant differences in the results. The increase in speed at higher temperatures up until 27°C may be attributed to increased metabolic activity, since 27°C falls within the optimal temperature for *E. gracilis* growth (Buetow, 1962). The decrease in speed above optimal temperature may have been due to denaturation of metabolic enzymes, hindering structures like the flagella (Humphries, 2013). We predicted that the rate of swimming of *E. gracilis* would increase up until the upper temperature limit and subsequently, as temperatures surpassed this value the rate would decline. Our prediction was met. We reject the null hypothesis and support the alternative hypothesis. Rising global temperatures will lead to increased motility and result in increased predator evasion thereby decreasing the amount of prey available for salmon in freshwater ecosystems.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Relative Abundance of *Mytilus edulis* (invasive) and *Mytilus trossulus* (native) in Differing CO₂ Concentrations of Vancouver Coastal Waters

Presenter(s): Polina Orlov

Abstract: Two species of blue mussels commonly coexist on Vancouver's coast: *Mytilus edulis* (invasive) and *Mytilus trossulus*, (native). Changes in their habitat, such as the predicted increase in water CO₂ concentration, can impact their distribution, with the possibility of one species outcompeting the other. Such changes can drastically affect British Columbia's marine ecosystem. Multiple studies have linked increasing CO₂ concentration with low fitness and shell dissolution in most mussel species. However, the effect on mussel interactions between the two species of interest remains largely unknown. This study aimed to measure the difference in relative abundance of *M. trossulus* and *M. edulis* at differing water CO₂ concentration on two Vancouver beaches. DNA was isolated from the mantle tissue of the mussel, and used for polymerase chain reaction (PCR) and gel electrophoresis analysis to identify the phenotypically-identical species. A t-test was performed on the mean water CO₂ measurements, resulting in a statistically significant difference between the two locations (p-value < 0.001), while a Fisher's test resulted in a statistically insignificant difference (p-value = 1.000) between the relative abundance of the two mussel species at the two sites. Findings suggest that the relative abundance of *M. trossulus* and *M. edulis* is unaffected by water CO₂ concentration of the observed range. Consequently, native and invasive blue mussel species' relative distributions are likely to remain unaffected by a small-scale increase in carbon dioxide levels but more research is required to understand the effects of CO₂ concentration outside of the observed range.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Ecotoxicological Effects of Filtered Mine Waste Drainage

Presenter(s): Lucy Myrol

Abstract: Bioaccumulation is a phenomenon that occurs when an aquatic organism or groups of organisms is repeatedly exposed to a substance with toxicological effects. If the rate at which the organism can excrete the substance is less than the rate at which the organism is ingesting, then a gradual increase in the concentration of the substance within the organism occurs, even though the concentration in the water surrounding the organism may remain constant. Over time this can pose ecotoxicological risks to the surrounding ecosystems; negatively affecting higher trophic levels as well as potentially affecting nearby human populations. Even after being filtered, the water released from mine waste drainage can contain a moderate to high concentration of potentially toxic substances. The long term ecotoxicological risk of exposure to certain elements when accounting for bioaccumulation is not a well studied topic. The aim of this study is to examine the potential for toxic substances in filtered mine waste drainage to have negative ecotoxicological effects on organisms in aquatic environments when accounting for bioaccumulation. By combining data from academic literature such as accepted bioaccumulation factors for different substances with experimental data taken from the University of British Columbia's small-scale monitoring of waste rock piles at the Antamina Mine in Peru, as well as the filtered water being released from the mine. This study analyzes the concentration of substances in the water and accounts for expected bioaccumulation factors to determine if the concentration of substances in the water has potential toxic effects on surrounding aquatic ecosystems. Analyzing the potential for negative ecotoxicological effects and better understanding the long-term consequences of exposure to certain heavy metals and elements enables better risk management and inherently risk mitigation.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Evidence of “super-emitting” behaviour in Canadian petroleum refineries

Presenter(s): Carlina Kim

Abstract: Research has indicated large disparities in the production of, and exposure to, industrial air pollution: A small fraction of industrial emitters called “super-emitters” contributes to the majority of industrial emissions of hazardous chemicals which disproportionately impacts vulnerable communities of low socio-economic status and racial minorities. As there is a lack of research for this issue in Canada, this research focuses on disparities in the production of pollution and aims to identify whether any of Canada’s 16 petroleum refineries are potential “super-emitters” that produce disproportionately high emissions of air pollutants. Geospatial and statistical analyses on the National Pollutant Release Inventory were conducted for the research.

Between 2014-2017, the top 10% of emitters between all 16 refineries released, on average, 59% of annual Ammonia emissions and 62% of annual Hydrogen Sulphide. Reoccurring refineries with disproportionately high levels of emissions across multiple pollutants were Co-op Refinery Complex, Saskatchewan and Sarnia Imperial Refinery, Ontario. Co-op was a major anomaly for Volatile Organic Carbons (VOCs) as it solely made up on average 34.6% of absolute total VOCs refineries emissions. Further, Co-op Refinery was also found to be a functional super-emitter of VOCs (meaning it had high emissions relative to the amount of oil produced). We identified Co-op and other refineries as absolute and functional super-emitters for a range of hazardous pollutants over the 2014-2017 period. Potential causes of this behaviour were investigated. This research may offer actionable insight for re-design of regulations in petroleum refineries and continue the research for environmental injustice.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: CO₂ from flue gases – Can it be an ancillary of municipal wastewater treatment in the Yangtze River Delta?

Presenter(s): Guramrit Bamrah, Ying Zhang

Abstract: With rapid industrialization and urbanization in China, water and air pollution have become increasingly pressing issues. Eutrophication has been rampant due to high emissions of phosphorus and nitrogen in municipal wastewater, especially in highly populated regions, such as the Yangtze River Delta (YRD). Additionally, large amounts of CO₂ emissions are produced in the YRD, where the GDP is greatly dependent on coal consumption and accounts for 20.26% of China's national economy as of 2014. However, recent studies have proposed a solution to alleviate these two environmental problems concomitantly, using high rate algae ponds (HRAPs) with excessive CO₂ as an ancillary. Furthermore, being a probable source of biodiesel, this method of wastewater treatment is more economical than traditional methods. In order to explore the feasibility of these technologies in the YRD, a broad literature review was conducted about HRAPs and the monoethanolamine (MEA) CO₂ extraction processes. Then, an existing case in Christchurch, New Zealand, was studied regarding its configuration, productivity and capital cost. By comparing Christchurch and the YRD in population, industrial conditions, annual average sunshine and climate, a conclusion was reached. Although the YRD has less sunshine and colder winters than Christchurch, it can be accommodated by using anthropogenic light and extra maintenance during the winter. Furthermore, the many coal-based power plants near the YRD can provide the CO₂, therefore saving the cost of transportation. With a proper operation strategy, the HRAPs with the CO₂ from the power plants holds the potential to be fruitful in the Yangtze River Delta.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Dragonflies of the past, present, and future; how have changes in oxygen levels affected dragonfly size over time?

Presenter(s): Jessica Schmidt, Fei Pan

Abstract: Understanding the response of animals to changing oxygen concentrations is imperative to interpreting the role of atmospheric oxygen, both in the past evolution of our biosphere, and the continued evolution of the future.

Here, we explore a potential relationship between the size of dragonflies, and atmospheric oxygen levels, drawing examples from the large dragonflies of the past, and modern species we can observe in the present. We then examine how changing oxygen levels in the future could potentially affect dragonfly size.

These questions were approached through a literature review, gathering information and using examples of the past and present, and speculations of the future.

Throughout the review process, we found oxygen levels have been variable throughout not only the early years of Earth's history, but the recent past, during which insects evolved and diversified. Periods of high oxygen levels are associated with large insects, such as the giant dragonfly (Meganeura). Larger dragonflies require greater respiratory investment, due to the limitations of a respiratory system that relies so heavily on simple diffusion. Because of this, higher oxygen levels help ease these requirements and facilitate larger dragonfly sizes. In contrast, lower oxygen levels likely decrease the size of dragonflies. In the future, it does not seem that oxygen levels will significantly rise, meaning we cannot expect dragonfly size to significantly increase, provided no innovative adaptation arises.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Local Knowledge and Marine Sustainability in the Canadian Arctic

Presenter(s): Kate Mussett

Abstract: The Canadian Arctic is changing rapidly. The effects of climate change are seen to a higher degree within Inuit communities in the North than anything we can understand. Coupled with the natural resource exploitation that has reached a limit which exceeds the carrying capacity for our constantly growing population, a shift in thinking and interacting with our natural world is necessary. The conversation which calls to action the use and implementation of Indigenous knowledge in natural resource management has grown alongside the field of environmental anthropology. Through these conversations we can come to understand the importance of local Indigenous knowledge, specifically in Northern marine species and ecosystems, through the inherent ability of Indigenous harvesting and management practices to adapt to changing environmental conditions. One of the greatest issues seen in the Arctic today is the degradation of fish and whale populations and ecosystems through over extraction, ocean pollution, and economic expansion. Ultimately, this has a profound effect on local communities, and the cultural practices which depend heavily on the health of the Arctic waters and species. Through data gathered from the Department of Fisheries and Oceans, Inuit oral histories, and ethnographies of co-management, I will explore the ways in which local Inuit knowledge in the Canadian Arctic have responded to dramatic shifts in climate and ecological conditions. This synthesis of scientific and anthropological data will unpack the future of Arctic marine and cultural sustainability, and the role local and commercial co-management play in it.

WAVE 2 | POSTER PRESENTATIONS

ABSTRACTS | 11:20AM - 12:30PM

Ballroom | Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Novel solar pump monitor to improve sustainability of renewable energy project with smallholder farmers in Nicaragua

Presenter(s): Skylar Kylstra, Emily Peer-Groves, Erin Kelly, Francis Durnin-Vermette

Abstract: Climate change currently exacerbates poverty and natural resource degradation globally. Reducing the effect of climate change by building the adaptive capacity of communities to deal with the various levels of change is key to building resilience. Smallholder farmers are among the most susceptible to the effects of climate change, and the threat that climate change poses to the sustainability of their livelihoods cannot be ignored. 90% of Nicaraguan farmers rely solely on rain to water crops, but droughts and unpredictable weather are becoming increasingly common, which is directly detrimental to the yields and livelihoods of Nicaraguan farmers. ENICALSA is an organization that provides solar pump irrigation systems to smallholder farmers in Nicaragua. ENICALSA has identified that if there was a monitoring device attached to farmers' irrigation systems which could communicate with ENICALSA, repairs would be more timely, thereby reducing pump downtime which is beneficial for farmers. UBC Sustaingineering has partnered with ENICALSA to develop a reliable, low-cost monitoring device that can be easily retrofitted onto existing farmers' solar pump irrigation systems. The device also has the potential to monitor factors including temperature, humidity, etc., which can inform farmers' management decisions.

As part of the project, ENICALSA and Sustaingineering are conducting an impact analysis, taking into account environmental, social, and economic sustainability metrics to determine if the pump monitor will enhance the sustainability of Nicaraguan agriculture. As part of this analysis, qualitative and quantitative data were collected in 2016/2017 by on-farm interviews with 30 farmers who received solar pump irrigation systems.

WAVE 3 | ORAL PRESENTATIONS

LIST | 2:00PM - 3:10PM

Ponderosa Commons: Oak House, 6445 University Boulevard



PCOH 1001

The Vestibular Control of Movement Transitions	Becky Tan
Wheelchair Propulsion Pattern And Muscle Activation In The Shoulder and Upper Arms	Michelle Huynh
Cultural Safety and Aboriginal Women Living with HIV/AIDS: A Vancouver Case Study	Clara Chang
The Dynamics of Thought: Constraints During Internally-Oriented Attention	Eisha Sharda

PCOH 1002

Charting the Territory: An Analysis of Potential Drug Interactions in Children with Severe Neurological Impairment	Sharan Sahota
CounterFlow Hemostatic Spray Halts Upper Gastrointestinal Bleeding in a Porcine Model	Nabil Ali-Mohamad
A smoked salmon salad and a glass of Bordeaux: What urban Chinese discourses regarding Western food reveal about culinary Occidentalism	Nicolas El Haik-Wagner
Applying 3D Printing to Traditional Printmaking	Kat Kott
Diversity and role of the marine microbe Labyrinthulomycota in British Columbia coastal aquatic ecosystems	Finola Fogarty

PCOH 1003

Screening toxicity of G4 ligand in combination with GRN or helicase inhibitor	Jung Yeon Lim
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Utility of EEG in Predicting Hemispheric Surgery Outcome

Khashayar Hanjani

Evaluation of endothelial cell dysfunction therapy as a potential treatment for mixed, Alzheimer's, and vascular dementia.

Niki Oveisi
Queenie Cheung
Ryan Chiu
Kaya Frese
Chloe Curry
Sarah Jhingan
Mara Mijatovic
Yugyoung Song
Jennifer Tong
Hannah Yang

The Graphic Lab: empowering teens through the graphic makerspace

Sam Talbot

PCOH 1008

The Effect of Seminal Fluid Exposure on The Risk of Preeclampsia Throughout Pregnancy

Priya Manackadath
Manjot Sandhu
Morelia Trznadel

Bio and Necropolitics: Capitalism's Production of Disposable Bodies Through a Spectrum of Permissibility

Lauren Grant

Access to Skilled Birth Attendance in Benue State Nigeria Using the Community Maternal Danger Score (CMDS)

Rajan Bola

Expression of epigenetic differences (histone marks) as possible mediators of resistance or sensitivity to ethanol-induced cell death in the developing neural tube

Tanveer Dhandwar
Cheryl Tan

PCOH 1215

Sexual and Gender Minority -Specific Structural Stigma Across Place and Time in North America

Maneh Rostomyan
Sara Zhang
Fatemeh Khonsarian

ERBB4 as a Diagnostic Biomarker for Human Viral Myocarditis

Jasmine Peng

Timely Sex: An Examination of Temporal and Spatial Boundaries of Sex in Ancient Greece Halla Bertrand

Resolving Distant Galaxies: An application of machine learning in Astronomy Henry Liu

Effect of a Four Year Grassland Set-aside on Soil Aggregate Stability Trish Hanuszak

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: The Vestibular Control of Movement Transitions

Presenter(s): Becky Tan

Abstract

The role that the vestibular system plays in balance and muscle activation is vital in human movement and balance. Understanding this system is critical in human movement disorders. The vestibular end-organs and their primary sensory afferents encode motion of the head in space and its orientation with respect to gravity. This information is integrated by the brain and muscle activation is generated for movement and balance. The vestibular control of balance, however, is only observed in lower leg muscles of standing participants when their motor commands and their sensory consequences are related. This study aims to identify when the vestibular control of standing balance is initiated in lower leg muscles during the transition from a seated to standing position. Participants were asked to stand from a seated position while receiving small electrical currents applied on the mastoid processes behind the ear. We recorded muscle activity from the gastrocnemius, biceps femoris and longissimus using surface electrodes. The results show that humans interrupt the vestibular balance stabilizing mechanisms around the onset of movement. This interruption appears first in the back muscles. Our findings show the brain re-activates vestibular control of muscles during a sit-to-stand movement approximately 500 ms after the onset of a sit-to-stand transition. This information is important for the design of future models that can be used to control sensorimotor and balance, as well as to identify for vestibular deficits in humans.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Wheelchair Propulsion Pattern And Muscle Activation In The Shoulder and Upper Arms

Presenter(s): Michelle Huynh

Abstract

Wheelchair users heavily rely on their arms for mobility. However, the frequent repetitive motions required to push the chair lead to strain in the muscles and joints in the upper body over time. Long-term wheelchair users typically experience pain and injuries in the shoulders as a result.

This research aims to determine whether certain wheelchair propulsion patterns favour certain muscles groups in the shoulder and upper arms.

To gather the data necessary to answer the research question, the experiment requires the participants, experienced wheelchair users, to move across surface using one of four wheelchair patterns, while wearing an electromyograph (EMG) to record the muscle activity around the shoulders and arms. The participant should also be filmed during the video to correlate the timing the cycle with the data from the EMG. This combination of data from the EMG and the video is then used to determine the activation of the muscle group during each stage of the cycle.

If this experiment were to be tested, it is predicted that different muscle groups are favoured in each propulsion pattern, but the push frequency and intensity of the muscle activation in the Arc pattern will be the highest, while the Semicircular motion will garner the lowest frequency.

Assuming the hypothesis is true, experienced wheelchair users can be instructed to use a variety of wheelchair propulsion patterns in certain ratios to prevent overuse of certain muscle groups, which can prevent injuries linked to the repetitive motion.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Cultural Safety and Aboriginal Women Living with HIV/AIDS: A Vancouver Case Study

Presenter(s): Clara Chang

Abstract

Aboriginal people have suffered a long history of colonialism, oppression and trauma within Canada. Due to the social and structural factors stemming from colonialism and racism, Aboriginal people are vulnerable to Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS). In 2011, their rate of infection was significantly higher than expected relative to their proportion in the Canadian population. Given the vulnerability of Aboriginal people, a cultural safety model comprising cultural awareness, cultural competency and cultural humility is employed by organizations providing healthcare to Aboriginal people within Vancouver in order to meet their particular needs. Yet, Aboriginal women living with HIV/AIDS are experiencing increasing rates of mortality. How adequate is this model in addressing the specific needs of Aboriginal women living with HIV/AIDS? A critical review of existing research on both the care of Aboriginal women living with HIV/AIDS and cultural safety as it applies to the care of Aboriginal people living with HIV/AIDS will be conducted. A case-based approach will be utilized to examine the Vancouver Native Health Society's (VNHS) healthcare programming for Aboriginal women and Aboriginal people living with HIV/AIDS in the Downtown Eastside (DTES). The cultural safety model as it is applied in this case study is conceptually sound but does not in practice address the unique needs of Aboriginal women living with HIV/AIDS. This research could pave the way for adjustments to both existing and future programming and government policy targeting Aboriginal women's health and HIV/AIDS.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: The Dynamics of Thought: Constraints During Internally-Oriented Attention

Presenter(s): Eisha Sharda

Abstract

Conventionally, mind-wandering is considered in a task-centric manner. While this is sometimes the case, imagine sitting on a bus and working on a math problem in one instance, and letting your mind wander freely in another. With the math problem, the mind is not wandering, but rather fixed on something. In the latter example, the mind seems to move freely without direction. To capture these differences, Christoff et al. propose a model in which spontaneous thought occurs in the absence or reduced levels of two different constraints types: deliberate and automatic constraints. Deliberate constraints are flexible and engaged with cognitive control; automatic constraints operate outside of conscious control. Varying constraints levels give rise to three different types of spontaneous thought: dreaming, mind-wandering and creative thinking. This exploratory study aimed to apply this model in a laboratory setting and examine thought dynamics amongst undergraduate students. Specifically, we used experience sampling to find the relative distribution of constrained versus unconstrained mental states by intermittently probing participants and asking them to rate their naturally unfolding thoughts. It was hypothesized that the three dimensions of thought would be independent and that freedom in thought movement would imply relatively less direction or automaticity. Pilot data has provided evidence that a freely-moving mind is less constrained and evidence of deliberate and automatic thought, suggesting that all mental activity in the absence of an external task is not mind-wandering. This novel research provides insight into internally-oriented attention and the different levels of constraints during internally oriented thought.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Charting the Territory: An Analysis of Potential Drug Interactions in Children with Severe Neurological Impairment

Presenter(s): Sharan Sahota

Abstract

Charting the Territory was a three-year, multi-center, longitudinal cohort study that examined the clinical progression of children with neurologic, metabolic or chromosomal conditions affecting the central nervous system. These children often experience pain and irritability, constipation, seizures and have difficulties breathing, feeding and sleeping. As a result, many of them are on a cocktail of medications and nutritional supplements. The analysis identifies and classifies the risk of drug interactions in this vulnerable patient population and examines the risk for potential adverse events. Baseline data was used to calculate the total number of medications for the 275 participating children. The mean number of drugs for all study participants was 5.4. The children with the most medications, illustrative of the most complex cases, were selected for further analysis. The top 5% (n=14) of children averaged 17.6 medications each (median=17, range=12-28) and were at risk of 18 drug-drug interactions on average. Of the total 249 interactions, 3.6% require complete avoidance, 23.5% require therapy modification and 72.9% require monitoring. The most common potential adverse events were CNS depression (n=12), alterations in therapeutic effect (increased n=10, decreased n=6), and increased bleeding (n=5). A typical example of a drug interaction requiring close monitoring is amitriptyline and ondansetron, which increases the risk of serotonin syndrome (n=4) and its symptoms: high fever, tachycardia, confusion, agitation and tremors. It is unknown if children experienced adverse drug reactions or received monitoring. A proactive approach is warranted for the management of drug-drug interactions in this highly complex and vulnerable pediatric population.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: CounterFlow Hemostatic Spray Halts Upper Gastrointestinal Bleeding in a Porcine Model

Presenter(s): Nabil Ali-Mohamad

Abstract

Upper gastrointestinal bleeding (UGIB), defined as bleeding from the mouth to the duodenum, affects up to 150 per 100 000 adults per year, with approximately 5-30% of cases leading to death. These bleeds are high risk, difficult to stop, and prone to rebleeding. While electrocautery and clamps have become the mainstay in surgical endoscopic bleeding management, they are limited by the precision and skill of the operator and the surface of the bleeding site. Therefore, spray therapies are ideal as they can cover large areas quickly and apply hemostatic agents to inaccessible areas when managing bleeding with an endoscope. A new powder technology (CounterFlow) delivering hemostatic agents deep into wounds was successfully used to halt bleeding without compression in a porcine model of arterial hemorrhage. This project explores whether CounterFlow can be used to clot arterial UGIBs, reducing the time to hemostasis and the rebleed rates. A sprayable formulation of CounterFlow has been developed specific to gastrointestinal bleeding along with an endoscope compatible spray system. Pilot experiments of gastrointestinal bleeding in a swine model of severe UGIB show that CounterFlow required less than 2% of the powder used by Hemospray (COOK), a spray therapy currently available for use by clinicians, in a similar experiment. CounterFlow's ability to deliver hemostatics into UGIBs shows promising results to enable effective management of high flowrate bleeds, which could reduce surgical times and the need for blood products.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: A smoked salmon salad and a glass of Bordeaux: What urban Chinese discourses regarding Western food reveal about culinary Occidentalism

Presenter(s): Nicolas El Haik-Wagner

Abstract

The opening of McDonalds and KFC in China in the wake of Deng Xiaoping's economic reforms in the late 1980s drew a lot attention on Chinese socialist market economy and on the attraction of Western capitalist modernity for Chinese urbanites. Contrary to French sociologist Bourdieu's theories, which assumed that consumption patterns were tied to dynamics of social distinction, eating Western food in China seemed more aspirational than an actual marker of social positioning. In the 1990s, going to fast food outlets was largely not about the taste, but rather a unique way of experiencing exoticism and whiteness, of feeling and being "modern" and thereby of asserting one's cosmopolitanism. Following ethnographic observations undertaken during a three-month internship at the Food & Beverage Unit of the French Consulate in Shanghai, and drawing on Farrer's concept of culinary Occidentalism, I argue that consumption of Western food acts as one of the main drivers of the everyday Occidentalist discourses in contemporary China. Semi-structured interviews were conducted with eight young urban Chinese professionals and two experts of the food and wine industry. Food posts on the social media WeChat were also examined. Interviewees, born in the 1980-1990s, who studied and/or worked temporarily abroad, have been immersed since their birth in this Western "modernity". As a result, this new generation has been renewing strategies of social distinction associated to the consumption of Western food, which a search for healthy, non-mainstream foodways, for authenticity, as well as with the display of a "food cultural capital" and a highly reflexive relationship to WeChat postings.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Applying 3D Printing to Traditional Printmaking

Presenter(s): Kat Kott

Abstract

I've been exploring how 3D printing and other newer printing techniques can exist in traditional techniques. I've 3D printed some blocks that I've inked like traditional wood or lino blocks and run through the printing press. In this next term, I plan to incorporate digital printing and 3D printing in conjunction with traditional printmaking techniques to make a digitally printed image with 3D definition from the plate.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Diversity and role of the marine microbe Labyrinthulomycota in British Columbia coastal aquatic ecosystems

Presenter(s): Finola Fogarty

Abstract

Marine microbes are essential for decomposition and recycling of nutrients in the ocean. Labyrinthulomycota are a group of marine protists that are characterized by extensions of their cell membrane called ectoplasmic nets. Although mostly decomposers, some species of Labyrinthulomycota are opportunistic parasites of invertebrates such as flatworms and seagrass. A recent study suggested that a particular species may be associated with Sea Star Wasting Disease (SSWD) in British Columbia, which devastated purple sea star populations starting in 2013. Our project focused on identifying dominant Labyrinthulomycota species along the coast of BC and determining patterns of diversity. We also aimed to gather more information on whether they may be causing SSWD. We isolated growths from sick sea stars and other decaying marine substrates from 12 sites along the coast, and identified species using high-resolution microscopy and genetic data. The isolates that we obtained from this project belonged to three major groups determined by morphology and phylogenetic data. Members of the Oblongichytrium group were present at almost all sites and grew on a wide variety of substrates. Thraustochytrids also grew on multiple substrate types but were less widespread, and only one member from the Aurantiochytrium group was isolated. An Oblongichytrium species that had previously been attributed to SSWD was isolated from substrates other than sick sea stars, suggesting that it may have more generalist characteristics than previously thought. Our findings of the diversity and distribution of Labyrinthulomycota increases our understanding of their role in aquatic ecosystems and their potential role in SSWD.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Screening toxicity of G4 ligand in combination with GRN or helicase inhibitor

Presenter(s): Jung Yeon Lim

Abstract

Cancer transformation and proliferation involve lengthening of telomere by activated telomerase and genome instability. A common way to combat cancer is to target the factors that promote cancer growth. G quadruplex (G4) ligands are secondary DNA structures that bind to DNA. Effects include inhibition of transcription, translation, as well as telomerase activity to elongate telomeric ends. GRN is a synthetic lipid molecule that binds telomerase and inhibits its activity. Helicase inhibitors WRN and BLM inhibit the activity of helicase and prevent replication. The goal of this study was to screen for the treatment of breast cancer in combination of G4 ligand and GRN or helicase inhibitor. We hypothesized that there would be an additive or synergistic effect when two different types of drugs are used together. To test this hypothesis, a factorial experiment was performed to determine the best concentration for each type of drug then a co-treatment assay. Cell confluency over 3-5days was measured to determine the toxicity of drugs. When cells were treated with a combination of G4 ligand and GRN, there seemed to be an antagonistic effect whereas a combination of G4 ligand and BLM helicase inhibitor resulted in an additive effect. Cell proliferation data indicate that addition of BLM reduces the time it takes for G4 ligand to have an effect. The difference was significant only at the beginning stages of cancer cell proliferation. Further investigation can be done to find the reason for an antagonistic and additive effect.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Utility of EEG in Predicting Hemispheric Surgery Outcome

Presenter(s): Khashayar Hanjani

Abstract

Treatment resistant epilepsy is a major health burden. Recurrent seizures can result in negative sequelae which include seizure related injury, cognitive and memory impairment, and increased healthcare utilization. Hemispheric surgery is an excellent and potentially curative option for carefully selected patients and is currently underutilized. One of the important modalities used to assess patient suitability for the surgery is the electroencephalogram (EEG), which can non-invasively study brain activity. The goal of this project was to evaluate the role of EEG in predicting surgery outcome. We hypothesized that generalized or bilateral epileptic abnormalities captured on EEG would be associated with risk of ongoing seizures and ongoing need for anti-epileptic drugs (AEDs), post-surgery. To test this hypothesis, the medical records of all patients who had undergone hemispheric surgery at BC Children's Hospital were evaluated. Data was gathered on clinical history, neuroimaging, EEG reports, seizure types, seizure frequency pre- and post-surgery and AED use. Analysis of the data showed trends towards increased seizure recurrence and AED use with bilateral or generalized brain abnormalities, as hypothesized. However, these results were not significant, likely due to small sample size. It was also observed that over 90% of patients had very good outcomes in terms of seizure freedom, therefore any modest prediction capability with regards to seizure recurrence would be of limited clinical use. However, 43% percent of patients were still using AEDs post-surgery despite seizure freedom. This points to a potential utility for EEG in informing post-surgical care regarding AED weaning.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Evaluation of endothelial cell dysfunction therapy as a potential treatment for mixed, Alzheimer's, and vascular dementia.

Presenter(s): Niki Oveisi, Queenie Cheung, Ryan Chiu, Kaya Frese, Chloe Curry, Sarah Jhingan, Mara Mijatovic, Yugyoung Song, Jennifer Tong, Hannah Yang

Abstract

Alzheimer's disease (AD) is the leading form of dementia with incurable deterioration of memory, cognition, and behavior. Vascular dementia (VD) is another common form, with heterogeneous patterns of cognitive impairment due to blood flow problems in the brain.

AD and VD co-exist in more than half of all confirmed AD cases. This condition, termed mixed dementia (MD), is highly heterogeneous and challenging to diagnose. Therefore, these patients must be treated early to halt further neurodegeneration (brain cell death).

Cerebral small vessel disease (SVD) is a common contributor to both AD and VD. A core mechanism in SVD is blood-brain barrier (BBB) failure, which is caused by dysfunction of endothelial cells (EC) that form the BBB. We hypothesize that targeting EC dysfunction can provide a new therapeutic strategy to reverse SVD and benefit early MD patients.

We conducted a 2-years longitudinal study to evaluate EC dysfunction reversal therapy in participants with AD, VD, or MD. The primary measure was the change from baseline to 2y in scores on the 11-item cognitive subscale of the AD Assessment Scale (ADAS-cog11). Other measures included: biosample (AB and Tau), and imaging (MRI atrophy rates, Amyloid PET).

AD_placebo vs. treated:

Significant reduction in atrophy.

VD_placebo vs. treated:

Significant reduction in ADAS-cog1, Biosample, and atrophy.

MD_placebo vs. treated:

Significant reduction in ADAS-cog1 and atrophy.

Targeting EC dysfunction may be a promising therapy especially for dementia with vascular pathology. A combination therapy (with other therapeutic targets) may provide further benefits to the patients with Alzheimer's pathology

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title:

Presenter(s): Sam Talbot

Abstract

Graphic design is a key tool to effectively convey ideas and affect change. This project investigates ways of facilitating access to the tools and methodologies of graphic design on a traditionally underserved group: teenagers. This project, spearheaded by the author with Dr. Katherine Gillieson at Emily Carr, is undertaken in collaboration with the Gibson's YMCA Youth Centre. Through the development and implementation of an open access graphic design workspace (Graphic Lab), we seek a deeper understanding of what are the most effective strategies to empower teens to engage in formal graphic design production. Teenagers, as a group, face unique challenges; ageism and other factors leads many of them to not be trusted with sharp objects or expensive materials, for instance. Part of the project is to implement strategies to make the Graphic Lab as un-intimidating and empowering as possible. Developing a Graphic Lab tailored to the needs of teens (our edge case) will allow us to learn how access to these tools can be made easier for all people. The project therefore also allows us to gain insight on how to best implement the open access graphic lab in other settings, whether it is with teens or other demographic groups.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Effect of Seminal Fluid Exposure on The Risk of Preeclampsia Throughout Pregnancy

Presenter(s): Priya Manackadath, Manjot Sandhu, Morelia Trznadel

Abstract

Preeclampsia is the most commonly occurring condition among pregnant women, which is characterized by unusually high blood pressure. It is one of the most prevalent complications during pregnancy, and currently, the only treatment is delivery. Previous research has linked this disorder to sexual cohabitation and exposure to the paternal antigens that are present in the seminal fluids but there has been an ongoing debate within the scientific community about the effects of this exposure before or after conception on the risk of preeclampsia. However, other studies have argued that sexual cohabitation with the same partner can decrease the risk of the mother developing preeclampsia in a subsequent pregnancy. Therefore, the objective of our study is to examine the effect of seminal fluid exposure and sexual cohabitation before conception as well as throughout pregnancy on perinatal outcomes, specifically preeclampsia. This will study aims to improve our understanding of pre-eclampsia and hopes to provide more insight on preventing the disease.

Method: We will be doing an evaluation study to assess the methods used by various papers that lead them to a specific conclusion. For our study, we assume that sexual cohabitation is defined by consistent sexual intercourse without any barrier contraceptives for several months prior to conception and during gestation. By comparing multiple papers that surveyed samples of pregnant women and their cohabitation habits, we attempt to determine whether there is a paternal cause of preeclampsia. We aim to examine and compare both arguments and attempt to find a pattern between the methods and the result for each of the studies by identifying limitations and strengths.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Bio and Necropolitics: Capitalism's Production of Disposable Bodies Through a Spectrum of Permissibility

Presenter(s): Lauren Grant

Abstract

This presentation assumes that the neoliberal, capitalist market has emerged as the ultimate ruling sovereign. Pointing to the ways in which this new sovereign has materialized power over its subjects, the presentation analyzes the way in which democratic citizenship has become synonymous with capitalism's laborers and neoliberalism's consumers. Employing Foucault's Biopower and Mbembe's Necropolitics, this presentation demonstrates the ways in which the market sovereign constitutes a spectrum of disposability over its subjects, with value assigned to each subject on the premise of their ability and/or their desire to comply with the demands of capitalism. The presentation concludes by analyzing the ways in which discursive constructivism is instrumentalized to reproduce ideologies of "the other" that ultimately work to realize and sustain the successful functioning of the capitalist, neoliberal sovereign.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Access to Skilled Birth Attendance in Benue State Nigeria Using the Community Maternal Danger Score (CMDS)

Presenter(s): Rajan Bola

Abstract

Currently, maternal and neonatal mortality remains high in many low-and-middle-income countries where home births are common. Many of these deaths could be prevented with skilled birth attendance (SBA), which majority of pregnant women in Benue State do not seek. Encouraging pregnant women to seek care has drastically reduced rates of mortality in countries where such interventions were mediated. However, it is not known whether interventions involving the use of evidence-based risk-analysis tools are effective in promoting SBA. We hypothesize that by developing a risk-analysis tool targeting risk factors during pregnancy, the Community Maternal Danger Score (CMDS), and implementing it during antenatal care (ANC) visits, midwives and caretakers in Benue State Nigeria might be better able to assess pregnant women's risk and promote SBA. The CMDS will use evidence-based risk factors that predict the need to seek SBA. These include a spectrum of factors in the categories of age, parity, history, height, weight, and blood pressure. The CMDS tool will enable caretakers to rapidly assess and triage pregnant women during ANC using the determined risk score. We will apply this tool prospectively to 2 cohorts of Nigerian women: one who has sought out ANC and a second, identified from the community, comparing them to control groups. Birth outcomes, including SBA, will be recorded. Overall, the results of this study may further enable caretakers in Nigeria to effectively triage and recommend interventions in areas where access to emergent care is not possible, thus preventing maternal and neonatal mortality.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Expression of epigenetic differences (histone marks) as possible mediators of resistance or sensitivity to ethanol-induced cell death in the developing neural tube

Presenter(s): Tanveer Dhandwar, Cheryl Tan

Abstract

The type and severity of ethanol-induced teratogenesis is greatly impacted by genetics. However, genetic differences can be mediated through different mechanisms, resulting in differential gene expression.

Previously, BXD recombinant inbred mouse strains were identified as showing either high or low levels of cell death in the developing brainstem following in utero ethanol exposure. The goal of this study was to test whether strain differences could be due to varying epigenetic modifications, specifically those relating to histone proteins (H3, H3K4, and H3K27).

BXD strains used to generate the embryos were divided into 2 treatments: 1) ethanol exposed embryos were given 5.8 g/kg ethanol via intragastric gavage and 2) control embryos were given isocaloric maltose-dextrin; both in 2 doses. Embryos were collected at embryonic day 9.5. After paraffin embedding, the chosen epigenetic modifications were analyzed in the developing brainstem using immunohistochemistry. The molecules examined included the H3 histone protein (control), H3K4 methylation (indicative of transcriptional up-regulation), and H3K27 methylation (indicative of transcriptional repression).

The image processing software ImageJ was used to analyze and quantify staining results. Embryos from all treatment groups showed comparable levels of H3 and H3K4 methylation. The high susceptibility BXD strains treated with ethanol showed significantly higher levels of H3K27 methylation when compared with all other treatment groups. The low susceptibility ethanol-treated strains and the maltose-dextrin treatment groups all showed comparable minimal levels of H3K27 methylation. These results suggested that differential expression of epigenetic marks could be associated with varied susceptibility to ethanol-induced cell death.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Sexual and Gender Minority -Specific Structural Stigma Across Place and Time in North America

Presenter(s): Maneh Rostomyan, Sara Zhang, Fatemeh Khonsarian

Abstract

Psychological and sociological research have provided essential insights into how stigma operates to disadvantage the social groups who are affected by it. At the same time, stigma research has been criticized for being too focused on the perceptions of stigmatized individuals and on micro-level interactions, rather than attending to structural forms of stigma. Our research project seeks to quantify the levels of sexual and gender minority-specific structural stigma across place and time, in North America in the recent decades. We applied the International Lesbian, Gay, Bisexual, Trans, and Intersex (LGBTI) Association (“ILGA”) Index, first designed and implemented in Europe. Data were extracted from reports on legislation and case law (e.g. Government of Canada, Williams Institute, Halsbury’s Legal Encyclopedia, etc.) to identify the dates when specific social and legal protections were enacted for LGBTI individuals federally, in Canada and the USA, and across the 13 provinces and territories of Canada. We specifically examined laws and policies that have a direct impact on the LGBTI people’s human rights across six categories, namely equality and non-discrimination, family, bias motivated speech/violence, legal gender recognition, freedom of assembly, association and expression, and asylum. Ultimately, we hope the results of our project will be useful for future sexual and gender minority health research and contribute to reduce stigma and discrimination against sexual and gender minorities.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: ERBB4 as a Diagnostic Biomarker for Human Viral Myocarditis

Presenter(s): Jasmine Peng

Abstract

Myocarditis, defined as the inflammation of the heart muscle, is a major cause of sudden, unexpected death in children and young adults. In developed countries, viral infections are the most prevalent cause of human myocarditis. Clinical presentation may range from asymptomatic to life-threatening arrhythmias and heart failure, making viral myocarditis exceedingly difficult to diagnose. The current diagnostic gold standard, the Dallas Classification System, demonstrates a clinical sensitivity of less than 30%. To improve diagnosis, we examined receptor tyrosine-protein kinase ERBB4 which has been heavily implicated in heart failure and infectious diseases.

A retrospective cohort of 44 explant hearts (10 viral myocarditis, 4 query viral myocarditis, 11 non-viral lymphocytic myocarditis, 19 other common cardiomyopathies) of pathologist confirmed diagnoses was examined for ERBB4 using immunohistochemical staining. Staining intensity was assessed by computer aided image analysis. Fold-change and signal intensities were normalized to the average intensity of control hearts. We hypothesize that differential expression of ERBB4 is specific to the pathogenesis of viral myocarditis and may be used to improve diagnostic sensitivity of human viral myocarditis. Our results demonstrate that ERBB4 expression was higher in representative cases of viral myocarditis compared to non-viral lymphocytic myocarditis and other common cardiac pathologies. ERBB4 was seen to increase and accumulate in cardiomyocytes in viral myocarditis and was detectable even in regions of the heart away from inflammatory infiltrate and myocyte necrosis. Therefore, we conclude that ERBB4 may be useful as a diagnostic adjunct to the current Dallas Classification System in the detection of human viral myocarditis.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Timely Sex: An Examination of Temporal and Spatial Boundaries of Sex in Ancient Greece

Presenter(s): Halla Bertrand

Abstract

This presentation offers a critical analysis of the crossover between sex work and woolworking done by women in Ancient Greece. For sex workers, woolworking is used to confirm or disguise their identity as a sex worker, and they navigate power relationships via the performative and explicitly visual nature of woolworking. The performance is done by delineating the time and geographical space of their sex work. This presentation uses primary texts such as legal documents and satirical dialogues, in addition to archaeological evidence such as vases to complement pre-existing scholarship on sex work and woolworking in antiquity. Of particular interest is the visual representation of material exchange for sex on vases.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Resolving Distant Galaxies: An application of machine learning in Astronomy

Presenter(s): Henry Liu

Abstract

Galaxies bright in the submillimetre wavelengths (known as submillimetre galaxies, or SMGs) has been shown to be among the earliest and most actively star-forming galaxies in the Universe. However, it is extremely difficult to observe sources in the submm range with good angular resolution due decreasing angular resolution in images at long wavelengths. The direct observation of a statistically significant sample of submm sources would be extremely costly and unpractical due to limited observation time on select high resolution telescopes. Thus, the identification of counterparts of these sources in other optical and infrared wavelengths is crucial in order to build accurate models of star-forming galaxies in the early universe. Recent follow-up observations of a large sample of single-dish detected SMGs with the Atacama Large Millimetre Array (ALMA) have provided the resolution necessary for multiwavelength identification with optical or infrared wavelengths. We use this ALMA sample to develop a training set for machine learning algorithms to determine how to identify SMG counterparts in multiwavelength images, using a combination of magnitudes and other derived features. We apply our models and find that a neural network performs best, accurately identifying 85% of the detected counterparts in our tests. We apply our trained neural network model to another survey field which has yet to be observed by a follow-up survey, and find that we are able to classify counterparts for 36/67 sources. Finally, we apply further testing and confirm the validity of our classified catalogue.

WAVE 3 | ORAL PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Effect of a Four Year Grassland Set-aside on Soil Aggregate Stability

Presenter(s): Trish Hanuszak

Abstract

Grassland set-asides are a conservation practice employed to improve soil that has deteriorated due to cultivation. Conventionally, grassland set-asides are implemented for 10 (or more) years to enhance or rebuild soil quality. Due to insecure land tenure and limited farm land in Ladner, British Columbia, removing agricultural land from production and placing it into long term set-asides is unfeasible. In this region grassland set-asides are implemented for one to four years. This study evaluates the effect of a short term (4 years) grassland set-aside on soil aggregate stability, as an indicator of soil quality. The study was conducted at two sites in Ladner from 2015 to 2018. Each site has a grassland set-aside with an adjacent annual cropping field. The sites were sampled before the grassland set-asides were seeded in 2015 and again at the end of the study in 2018. After sampling in 2015 the soil of one site was classified as degraded while the other was classified as fertile. The degraded site demonstrated no marked differences over the course of the study while the productive site exhibited a significant difference in aggregate stability with an increase in 2-6mm aggregates in the grassland set-aside. The results of this study highlight the need to establish baseline soil quality indices to determine which fields can benefit from short term grassland set-asides. Soils that fall below baseline indices may require long term grassland set-asides to remediate. The findings of this study will be used to inform implementation strategies for stakeholders involved in grassland set-aside programs.

WAVE 3 | POSTER PRESENTATIONS

LIST | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

THEME: HEALTH AND WELLNESS

Extracorporeal shock wave lithotripsy in the management of distal ureteral calculi	Victor Wong
Diagnostic and Prognostic Potential of Serum and Cerebrospinal Fluid UCH-L1 in Acute Human Traumatic Spinal Cord Injury	Aysha Allard Brown
Identification of Epigenetically Regulated Enhancer DNA Regions in Response to Dietary Polyphenols in Breast Cancer Cells	Sadaf Harandi-Zadeh
Drinking Behaviour as a Means to Assess Heat Stress in Dairy Cows	Hannah Spitzer
Lad1 as a Regulator of the Retromer Complex	Laura Frankow Donald Ng
ADRA2B Deletion Variant and Anxiety	Haslin Park
The use of EVS to assess vestibular control of human standing balance	Eric Dorflinger
Patients' knowledge and beliefs about oral anticoagulants: a systematic review of the literature	Elaine Hu Jinny Choi Amelia Choy William Shen
Characterizing NEPN Signalling Axis to Diagnose Viral Myocarditis	Al Rohet Hossain
Stress Granules Contribute to Pediatric Brain Tumors Response to Oxidative Stress. A New Therapeutic Opportunity?	Brian Cho

Identification of the aberrant DNA methylation during Chronic Lymphocytic Leukemia (CLL) progression	Ting-An Cheng Enoch Yau Diyana Ibrahim
The prevalence and management of inflammatory bowel disease on Vancouver Island	Aiyden Martindale
fMRI Investigation of Controlled Semantic Integration in Schizophrenia	Amanda Hage-Hassan
Various genotypes' susceptibility to Mycobacterium Tuberculosis as observed in mice	Sasha Dvoskin Sophie Veri
The Optimal Ratio of Basic Fibroblast Growth Factor (FGF-2) and Transforming Growth Factor (TGFB1) for treatment of the meniscus	Josh Hashimoto Yasmine Lau
Novel role of Angiopoietin-1 in cardio fibro/adipogenic progenitors	Lucas Rempel
Characterization of Cyp26b1 in the developing mouse cerebellum	Ani Markarian
Cardiovascular Health Benefits of Exercise Training in Persons Living with Type 1 Diabetes	Jacklyn Ku

THEME: INDIVIDUAL AND SOCIETY

Refining of rat approach-avoidance training	Mengyi Hu
Assessing the Cognitive Impact of Smartphone Presence	Paris Will
Grief on the Farm: How Young Dairy Calves Respond to the Death of a Conspecific	Charlotte Hursey
The Dagaare Low Vowels: a Possible Tenth Vowel in the Phonological Inventory of an Under-Studied Language	Angelina Lloy
The Influences of Punjabi Marketplaces on the Identity of a City	Eric Mann Gagan Cheema Gurleen Cheema

Exploring how the infant brain processes non-human vocalizations using functional near infrared spectroscopy

Mary Zhao
Garbo Lam

Information needs about the impacts of cancer treatment on pregnancy: A qualitative descriptive study of Reddit forums

Ria Garg

A critical review of literature on the social media strategies of the anti-vaccination movement

Derrick Sutanto

Rae Wilson

THEME: INNOVATION AND TECHNOLOGY

Outflow Analysis for Emergency Response and Environmental Assessment of Liquid Pipelines

Ryan Stewart

Assessing the effect of nacelle tilt actuation on wind turbine dynamic loads

Daniel Luo

Continuous monitoring of spinal cord hemodynamics using an optical sensor

Lorna Tu

The application of Raman Spectroscopy to assess directed differentiation of hESC-derived pancreatic cells in transplantation

Fennie Easton van der Graaf

INVESTIGATING PAX3 TEMPORAL AND SPATIAL DISTRIBUTION IN THE DEVELOPING CEREBELLUM

Erin Yang

Deep Learning for Optic Disc Segmentation in Diabetic Retinopathy Patients

Edward Kim
Bita Jokar
Yuting Wen
Kehong Liu

The Use of Robotics for Water Sampling

Gina Majdzadeh
Nando Hernando
Yuebo Yao
Farrandi Hernando
Zhina Majd

Mutagenesis, Molecular Cloning and Transformation Efficiency of the Hyperpolarization-activated Cyclic Nucleotide-gated (HCN) channel

Christian Francis

THEME: SUSTAINABILITY AND CONSERVATION

Geographical Morphological Variation in Gentoo Penguins	Jessica Ye
The Effects of Gentle Handling in Reducing the Fear of Laboratory Rats Undergoing Repeated Oral Gavage	Kristine Wong
Relationship Between Stream Discharge and Dissolved Oxygen Levels at Canyon Creek, and Implications Towards Salmon Development and Physiology	Yalda Hosseini Crista Rosenberg
Effects of Salinity on the Population Growth of <i>Chlamydomonas reinhardtii</i>	Cyndi Yan Portia Chen
A UV-LED based wastewater treatment proposal to reuse pulp and paper wastewater as irrigation water	Simeng Li
Transpiration and Chlorophyll levels over seasonal changes in American Sweetgum (<i>Liquidambar Styraciflua</i>) and Hungarian Oak (<i>Quercus Frainetto</i>) and the effect of environmental conditions on Japanese Katsura (<i>Cercidiphyllum Japonicum</i>)	Garvit Bhatt Alex Jimenez
OCEAN ACIDIFICATION AND WARMING AFFECTS BOTH THE FUNCTIONAL AND ABSOLUTE LIFESPAN OF A MARINE TREMATODE PARASITE	Veronika Franzova
The effect of mineral oil on the CO ₂ concentration of <i>Chlamydomonas reinhardtii</i> 's environment over time	Sarah Casciato Nav Dhaliwal Simran Brar
Is Burned-Area of Forests predictable?	Alice Zhang

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Extracorporeal shock wave lithotripsy in the management of distal ureteral calculi

Presenter(s): Victor Wong

Abstract

Current American Urological Association guidelines recommend ureteroscopy (URS) as the primary management option for distal ureteral stones, and shockwave lithotripsy (SWL) as a secondary option. This had led to the decrease in SWL utilization for the management of nephrolithiasis in North America. When compared to SWL, URS is more invasive and has a worse safety profile resulting in longer hospital stays, adjunctive procedures, and greater complication rates. We hypothesize that SWL continues to be an effective management option for the treatment of distal ureteral calculi, and reviewed our centre's patient data to determine the efficacy of SWL. A retrospective review of operative notes and medical charts of 104 patients treated initially with SWL for distal ureteral calculi between 2011 and 2017 was conducted. The success rate of SWL was determined via radiologic imaging and if subsequent procedures were required to render patients stone-free. Of these patients, 78.8% (n=82) were stone-free following one SWL and required no subsequent procedures. 87.5% (n=91) were stone-free after a second SWL procedure. After the initial SWL, residual stones were identified in 21.2% (n=22) of patients. Of these residual stone patients, 40.9% (n=9) required a repeat SWL, 40.9% (n=9) required an ureteroscopy and 18.2% (n=4) required a salvage ureteroscopy following a failed second SWL. Our study suggests that SWL continues to be an effective modality for the treatment of distal ureteral stones.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Diagnostic and Prognostic Potential of Serum and Cerebrospinal Fluid UCH-L1 in Acute Human Traumatic Spinal Cord Injury

Presenter(s): Aysha Allard Brown

Abstract

Currently, there are few treatment options for patients with acute spinal cord injury (SCI). A major obstacle for translational research in acute SCI is the lack of biomarkers to objectively classify injury severity and predict neurologic outcome. Research in neurochemical biomarkers for acute SCI would improve early clinical decision-making and enable the evaluation of novel therapies post-SCI, and is facilitated by the availability of both blood and cerebrospinal fluid (CSF) samples. Here, we will evaluate CSF and serum samples obtained from patients with acute SCI for the protein Ubiquitin C-Terminal Hydrolase L1 (UCH-L1). CSF and serum samples were collected as part of an ongoing clinical initiative in which acute SCI patients have had lumbar intrathecal catheters inserted for the collection of CSF over the first 5 days post-injury. UCH-L1 concentrations were measured using the Quanterix Simoa assay platform and correlated to injury severity and neurologic recovery. Our data suggest that UCH-L1 levels in CSF are increased in SCI patients compared with non-SCI controls, with levels being significantly different between injury severity classifications A, B and C, based on the American Spinal Injury Association Impairment Scale (AIS), and over the course of 5 days. Conversely, there was no significant difference in serum UCH-L1 between control and SCI subjects. Further, 24-h post-injury CSF UCH-L1 concentrations negatively correlated with motor score change over 6 months. Our first evaluation of UCH-L1 shows promise as a biomarker to reflect injury severity and predict outcome in acute SCI, which would be a valuable tool for the SCI field.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Identification of Epigenetically Regulated Enhancer DNA Regions in Response to Dietary Polyphenols in Breast Cancer Cells

Presenter(s): Sadaf Harandi-Zadeh

Abstract

Background: Epigenetic modifications, which include DNA methylation, covalent histone modifications and non-coding RNA mechanisms, play important roles in regulation of gene expression. DNA methylation, in particular, has attracted a lot of attention in terms of disease prevention and treatment. During carcinogenesis, tumor suppressor genes are methylated in their regulatory regions and silenced, whereas oncogenes lose methylation and become actively transcribed. In this study, we focus on enhancer regions, which are intensively studied gene regulatory regions, and investigate how dietary bioactive compounds, specifically resveratrol from grapes, change epigenetic makeup at enhancers of oncogenes and thereby attenuate cancer development.

Methods and Results: Human breast cancer cell lines, non-invasive MCF10CA1h and invasive MCF10CA1a, were treated with resveratrol at 15 μ M concentration for 9 days. The effect of the treatment on the DNA methylation patterns was determined using Illumina-450K methylation microarray. We found 1,751 and 1,803 differentially methylated CpG sites ($0.05 \leq$ differential methylation ≤ -0.05 , $p < 0.05$) located in enhancers upon resveratrol treatment in MCF10CA1h and MCF10CA1a cells, respectively, as compared with vehicle treated cells. Functions, biological processes, and signaling pathways of genes corresponding to differentially methylated sites were analyzed using bioinformatics tools. We further identified 103 genes that are hypermethylated targets in both breast cancer cell lines and discovered that majority of them is linked to oncogenic functions.

Conclusions: Our results confirm a potential role of dietary polyphenols in regulation of DNA methylation at enhancer regions which may result in silencing of genes with oncogenic functions and may contribute to anti-cancer action of these compounds.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Drinking Behaviour as a Means to Assess Heat Stress in Dairy Cows

Presenter(s): Hannah Spitzer

Abstract

Heat stress, or when body temperature rises above a set point, decreases milk production and the reproductive success of dairy cows. An inability to cool down negatively affects an animal's welfare by potentially leading to thirst, hunger, and frustration. Existing research focuses on lying behaviour and feed intake to evaluate cooling methods; however, less is known about how drinking behaviour could be used to assess heat stress. This study aims to evaluate how fan cooling during heat stress affects the drinking behaviour of indoor-housed dairy cows. In August to September 2018, 72 lactating dairy cows were placed into 6 groups and alternately exposed to 3-day fan on and fan off periods over the course of 12 days. Animals were housed in pens with 12 freestalls; temperature and humidity were recorded above the pens. Video cameras were used to determine the proportion of time spent drinking while at the drinker and to scan for the location of the cows in the pen throughout the day. Preliminary results show that fan cooling reduced the amount of time cows spent in the drinker compared to the amount of time they spent drinking and reduced the proportion of time cows spent in the area around the drinker. The initial results indicate that drinking behaviour may be a valuable tool to assess heat stress and cooling efficiency in dairy cows. Future research should focus on how to best minimize the behaviours studied using different cooling strategies.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Lad1 as a Regulator of the Retromer Complex

Presenter(s): Laura Frankow, Donald Ng

Abstract

Cellular function depends on the coordinated trafficking of protein cargoes to intended intracellular destinations. Disruption to trafficking pathways often results in human neurological disease. For example, a mutation in the Retromer recycling complex causes late-onset Parkinson's Disease (PD). Why exactly this occurs is currently unclear. A better understanding of how Retromer is regulated may provide insight into its role in the disease. The highly-conserved nature of Retromer makes it a candidate for study in the model organism *Saccharomyces cerevisiae*. In both humans and *S. cerevisiae*, the recruitment and function of Retromer depends on the Rab5 protein. In humans, Rab5 can be activated by a poorly understood activator protein known as VARP. Recently, a homolog of VARP has been discovered in *S. cerevisiae* known as Lad1. We hypothesized that Lad1 is a regulator of Retromer and that it would physically interact with Retromer and its other regulatory components. Using a genome-wide screening approach for physical interactors, Lad1 was found to interact with Rab5, multiple subunits of the Retromer complex and several potential cargo proteins. Our findings support a role for Lad1 as a regulator of Retromer and establish it as a model for understanding VARP's role in the human Retromer pathway.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: ADRA2B Deletion Variant and Anxiety

Presenter(s): Haslin Park

Abstract

Norepinephrine (NE), the main neurotransmitter released by the sympathetic system, works on many different adrenergic receptors. One of its roles is to prepare the body and the brain for “fight or flight” response. The dysregulation of the cortical NE system is thought by some researchers to be associated with many psychiatric disorders, such as anxiety. Within the NE system, α_2 adrenoreceptors play a role in regulating the system by inhibiting NE release. One common variation in the ADRA2B gene (which codes for α_2 adrenoreceptors) is a deletion variant that has been shown to influence effects of emotion on attention and memory; however, the link between the ADRA2B gene deletion variant and trait levels of anxiety has not been investigated. The current study investigated the link between the ADRA2B deletion variant and trait anxiety. 647 student volunteers from U of T and UBC were genotyped and completed questionnaires measuring trait anxiety and history of clinical anxiety. Trait anxiety scores were compared between carriers or non-carriers of the ADRA2B gene deletion in those who did and did not have a history of clinical anxiety. The results revealed that among those with no history of clinical anxiety, the deletion carriers had significantly higher trait anxiety scores than the non-carriers ($p = 0.0154$). However, there were no significant difference among those with history of clinical anxiety. This study indicates that the ADRA2B deletion variant predicts trait anxiety in healthy populations and suggests that clinical anxiety potentially changes this relationship.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The use of EVS to assess vestibular control of human standing balance

Presenter(s): Eric Dorflinger

Abstract

Electrical vestibular stimulation (EVS) can be used to assess the vestibular control of standing balance. When applied as a noisy input, linear system identification techniques can quantify the relationship between the input EVS and the output postural responses. In the present study, we examined the linearity of the EVS-evoked responses and the threshold at which noisy EVS stimulation elicits anterior-posterior (AP) whole-body acceleration during quiet standing balance. Ten healthy participants were exposed to noisy EVS applied to their mastoid processes while quietly standing on a force plate with their head turned 90 degrees to the left. The peak-to-peak amplitude of the EVS was varied randomly between trials (0 to 5mA). We estimated the EVS-evoked whole-body responses using coherence between EVS and AP whole-body acceleration in the 1-10Hz frequency band. Coherence is a measure of the linear relationship between two processes across various frequencies, with 0 indicating no correlation and 1 indicating a perfect linear relationship. The amplitude of the EVS evoked whole-body responses exhibited a linear relationship with stimulation intensity ($r=0.49$, $p=0.003$). We observed a threshold of 1mA to elicit whole-body responses to EVS. The linearity of the EVS-evoked whole-body responses supports the use of linear techniques to analyze responses to noisy EVS delivered at levels above the identified 1mA threshold.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Patients' knowledge and beliefs about oral anticoagulants: a systematic review of the literature

Presenter(s): Elaine Hu, Jinny Choi, Amelia Choy, William Shen

Abstract

Oral anticoagulants (OACs) are a group of medications that reduce the risk of thrombosis, the formation of clots in blood vessels. Anticoagulants such as warfarin increase bleeding risk, which patients must be properly educated to mitigate and detect. Identifying patient knowledge gaps is the first step towards improving patient education, adherence and ultimately, health outcomes. To date, there are no systematic reviews of patient knowledge gaps about OACs. Following PRISMA guidelines, we systematically searched PubMed, CINAHL, and PSYCHINFO databases for qualitative and quantitative studies that measured patients' knowledge about their OACs. Keywords included "knowledge gap," "medications," and closely related terms. We identified 290 studies from our initial search. Title and abstract screening led to 134 studies whose full-texts were reviewed for eligibility. Majority of the full texts were excluded for having irrelevant focus (n=70) or being editorials, opinion papers, letters to editors, or conference proceedings (n=12). Finally, 41 studies were included in this review (n=11220 patients), which were mostly published after 2010. Of the 41 studies, 14 were conducted in North America, 23 Europe, 3 Asia, and 6 in Australia. Most studies assessed patient knowledge on the older and more frequently prescribed warfarin (n=27), with very few focusing on the newer OACs (dabigatran: 7, aspirin: 3, apixaban: 4, rivaroxaban: 4). Over half of the included studies (71%) utilized validated tools to assess patient knowledge. Our results highlight the need for more studies on this topic, particularly in Africa and South America and on the newer medications.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Characterizing NEPN Signalling Axis to Diagnose Viral Myocarditis

Presenter(s): Al Rohet Hossain

Abstract

Background: Myocarditis is characterized by inflammation and damage of the heart muscle. Viral-myocarditis is the most common etiology in developed countries, where Coxsackievirus B3 (CVB3) is among the most common pathogens. Viral infection was shown to be associated with changes in the NEPN (Nrg1, ErbB4, Psen1, and Nup98) signalling axis proteins. We hypothesize that during pathogenesis, the NEPN proteins are cleaved, generating fragments released into the blood that are specific to viral myocarditis. Our project aims to develop a non-invasive, blood based diagnostic assay by evaluating the NEPN cleavage fragments as potential biomarkers.

Design: iPSC-derived cardiomyocytes and A/J mice were infected with sham (PBS) and CVB3; blood and hearts were harvested corresponding to different phases of viral myocarditis. IHC and Western-Blot analysis were performed to observe the expression of NEPN. Sham and CVB3 infected HeLa cells were used to observe the expression and sub-cellular localization of the NEPN proteins via Western-Blot and confocal microscopy respectively.

Results: Nrg1 is cleaved into ~65kDa (in heart-tissue) and ~35kDa (in plasma) fragments in A/J mice after infection. A ~37kDa cleavage fragment of ErbB4 was detected in plasma. Western-blot analyses suggested that viral attachment was sufficient to induce ErbB4 cleavage. Co-localization of protease Psen1 and its substrate ErbB4 was observed at the cell membrane of infected HeLa cells.

Conclusion: Detected cleavage fragments and characterization of the NEPN signalling axis may be further evaluated as biomarkers to develop a blood-based diagnostic assay for viral myocarditis.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Stress Granules Contribute to Pediatric Brain Tumors Response to Oxidative Stress. A New Therapeutic Opportunity?

Presenter(s): Brian Cho

Abstract

In the tumor microenvironment cells need to face potentially lethal acute changes including oxidative stress. To overcome oxidative stress tumor cells form stress granules (SGs), clusters of RNA and RNA binding proteins (RBPs). Through a previous report we found that RBPs promote the cellular antioxidant response by activating the transcription factor NRF2 (NFE2L2) leading to upregulation of genes critical for cell survival. We set out to determine if pediatric brain tumors rely on the formation of SGs to overcome oxidative stress and progress as well as to determine if SG inhibition could be a therapeutic approach for pediatric tumors. We analyzed public databases of mRNA expression of several RBPs and NFE2L2. Immunohistochemistry (IHC) for G3BP1, NRF2 and an oxidative stress marker was performed on tumour slides. Pediatric brain tumor cell lines were treated with NaAsO₂ and diethylmaleate to induce the formation of SGs by oxidative stress. SG presence was then determined by immunofluorescence (IF) with antibodies against the RBPs G3BP1 and TIA-1. In AT/RT, pGBP and EPN tumours, G3BP1 was among the RBPs showing a higher degree of correlation with NFE2L2 IHC confirmed the mRNA results. In pGBM high levels of G3BP1 were also predictive of poor outcome. NaAsO₂ and diethylmaleate treatments resulted in oxidative stress and induced the RBPs G3BP1 and TIA-1 to form SGs in vitro. SGs represent important mediators for the adaptive response of pediatric brain tumors to oxidative stress. Future studies will aim at discovering and validating pharmacological therapeutic approaches to block SGs in pediatric brain tumors.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Identification of the aberrant DNA methylation during Chronic Lymphocytic Leukemia (CLL) progression

Presenter(s): Ting-An Cheng, Enoch Yau, Diyana Ibrahim

Abstract

Various reversible chemical modifications of DNA, which alters the way the sequence is interpreted by the cellular machinery instead of the genetic code, occurs during lineage development in the hematopoietic system (1). A broad epigenetic programming has recently been described to occur during B-Cell maturation with prominent hypomethylation or loss of methyl groups (2) (3). Chronic lymphocytic leukemia (CLL) cases showed methylation changes at specific CpG sites associated with progression (4). We obtained datasets of 27 patients showing differential CpGs during disease progression and its corresponding genes. These data were collected at the time of diagnosis and after clinical progression, but before treatment. 4,752 CpGs were altered during disease progression and co-located near 2,670 genes. Using these genes, we found an altered somatic copy number in several chromosomes and methylation of CpG islands. However, none of the changes were associated with cancer-related genes or directly like to the development of CLL. In the future, it would be beneficial to continue to identify CpGs involved in disease progression and propose known drugs to block the critical pathways.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The prevalence and management of inflammatory bowel disease on Vancouver Island

Presenter(s): Aiyden Martindale

Abstract

Inflammatory Bowel Disease (IBD) is a chronic, debilitating disease that causes significant burden to patients and healthcare resources. The epidemiological understanding of IBD on Vancouver Island (VI) is lacking and there are no gastroenterologists (GI) north of Victoria, the southernmost city, limiting access for a significant proportion of the population. This pilot study aimed to better understand the prevalence and management of IBD on VI and determine whether disparities in IBD care exist among North, Central, and South VI. We accessed data from BC Data Scout and GI Central Access and Triage (GICAT) to gain estimates of IBD prevalence and resource use. Per capita rates for medication use, select interventions, and specialty consultations were calculated to compare IBD management across the regions. The estimated prevalence of IBD on VI was 0.77%, slightly higher than the national average (0.70%), with similar rates in all three regions. Over two thirds of IBD patients are from the Central or North Island, but only 30% of IBD referrals were from outside South VI. There were similar usage rates for medications and interventions across the regions, but considerably more GI consultations in the South Island (73.5%), and much higher rates of consultations with general surgery in both the North (46.2%) and Central regions (48.6%). These preliminary findings suggest that there is a high prevalence of IBD throughout VI and that, compared to the south, those in the North and Central Island experience inequitable access to high quality IBD care, likely leading to worse outcomes. These results suggest the need for increasing access to GI services north of Victoria.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: fMRI Investigation of Controlled Semantic Integration in Schizophrenia

Presenter(s): Amanda Hage-Hassan

Abstract

Schizophrenia is a neuropsychiatric disorder associated with global cognitive deficits in speech, which are considered a key feature of the disorder. These functional deficits are characterized by impairments in associating semantic concepts and an inability to organize and express thoughts, referred to as thought disorder. The goal of the current study is to conduct an exploratory analysis to identify the functional brain networks underlying controlled semantic association. 30 healthy controls and 28 schizophrenia patients completed a controlled semantic association task. Constrained principal component analysis for fMRI (fMRI-CPCA) was used to separate distinct, simultaneously-active, task-based networks. The CPCA analysis revealed three networks. While brain activity for controls reached a higher peak of activation than patients in the third (language) network, group differences were absent in the first and second networks. The results of the current fMRI study align with previous investigations which found that hypoactivity in frontotemporal language regions could be linked to thought disorder in schizophrenia. These results are important for understanding the brain networks underlying symptoms of thought disorder, and will influence neuromodulation treatments for otherwise treatment-resistant symptoms.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Various genotypes' susceptibility to Mycobacterium Tuberculosis as observed in mice

Presenter(s): Sasha Dvoskin, Sophie Veri

Abstract

Mycobacterium tuberculosis infected over ten million people in 2017, killing 1.3 million. The disease primarily affects the lungs, causing inflammation of the pleura, mucus buildup, and excessive coughing. The infection can be active or latent. While there are currently antibiotics to prevent infection and help the infected survive tuberculosis, it is very difficult to cure fully. Patients must be diagnosed quickly and receive extensive treatment in order to guarantee full recovery. A major concern is the continuous evolution of antibiotic resistant strains. AIDS patients, diabetics, and other sufferers of immunocompromising disease are at a particular risk. In addition to the aforementioned factors, research links certain genes with susceptibility to the bacterial disease. Lab research done on mice with varying relevant genotypes can show the correlation between the specific genes and the disease. In this experiment, three different strains of mice will be studied, two that are historically susceptible, and one that is predicted to be more resistant to the disease. The infection and host's resistant ability can be measured through blood tests quantifying the mouse's interferon-gamma levels, which is an activator released in a specific T-cell response to the body first recognizing tuberculosis bacteria. Another blood test will test for another T-cell response only released in the active patients in order to differentiate between active and latent forms of the infection. Observing susceptible genotypes could guide future research towards who to focus on and what aspects of their immune response need to be most assisted.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Optimal Ratio of Basic Fibroblast Growth Factor (FGF-2) and Transforming Growth Factor (TGFB1) for treatment of the meniscus

Presenter(s): Josh Hashimoto, Yasmine Lau

Abstract

Menisci are fibrocartilaginous structures in knee joints integral to stabilization during locomotion. They are made of mostly water, Type I and II collagens, and contain chondrocytes and fibroblast-like cells. There is no optimal treatment option due to diversity in tear types and ages of patients. There is incentive in finding better treatment methods as such injuries increase probability of joint degeneration, worsening degeneration if there is pre-existing osteoarthritis.

Treatment methods involve anabolic growth factors, which bind to receptors to initiate a sequence resulting in cell proliferation, differentiation, or death. Fibroblast growth factor two (FGF-2) can stimulate mitosis in chondrocytes and mesenchymal stem cells (MSCs) to form connective tissue. FGF-2 is known to causing breakdown of articular chondrocytes and human extracellular matrix, unlike in mammalian model organisms. However, paired with transforming growth factor beta 1 (TGFB1), FGF-2 has shown significant chondrocyte regeneration. Zhou et al. investigated both FGF-2 and TGFB1 effects on MSC proliferation, concluding FGF-2 promoted MSCs, but that it also inhibited anabolic cartilage growth. There is potential in adjusting FGF-2 and TGFB1 ratios to enhance regenerative capabilities.

Past studies commonly involve expensive in vivo experiments with menisci of mammalian organisms, at the expense of the organism's lives. Hunziker et al. instead used a less costly in vitro model to study the combination of FGF-2 and TGFB1, while also producing faster results.

There is potential with investigating the combination of FGF-2 and TGFB1 on in vitro models used by Hunziker et al. to develop better treatment methods for meniscal degeneration.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Novel role of Angiopoietin-1 in cardio fibro/adipogenic progenitors

Presenter(s): Lucas Rempel

Abstract

Angiogenesis is the formation of new blood vessels from pre-existing blood vessels. In clinical applications, angiogenesis is an excellent therapeutic target to treat different forms of cardiovascular disease, such as wounds resulting from ischemia, a condition caused by a lack of blood supply to the heart muscles. Angiogenesis is regulated by a variety of proteins. One of these proteins, Angiopoietin-1 (Angpt-1) contributes to vessel maturation and stability. Angpt-1 is thought to be constitutively expressed by pericytes on the endothelial cell layer of blood vessels. Our previous experimental results show that in addition to pericytes, fibro/adipogenic progenitors (FAPs) contribute to angiogenesis and express Angpt-1. FAPs are tissue-resident mesenchymal stromal cells (MSCs) that proliferate in response to muscle damage. The proliferation of FAPs are thought to help repair damaged muscle, but in pathological conditions, FAPs differentiate into fibroblasts and adipocytes. This specific study aims to show if adipogenesis in cardiac muscle is a result of the depletion of the Angpt-1 gene in cardiac FAPs following cardiac muscle damage. To do this, we mapped the gene expression of cardiac FAPs and pericytes to understand the gene profile of both perivascular cells. Immunofluorescent staining and computer analysis on heart vasculature and adipogenesis on wild-type and Angpt-1 knock-out mice were also performed to further elucidate the roles of pericytes and FAPs behind angiogenesis, which may allow for new ways to advance therapeutic solutions to cardiac ischemia.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Characterization of Cyp26b1 in the developing mouse cerebellum

Presenter(s): Ani Markarian

Abstract

During embryonic development, the cerebellum establishes a gradient of retinoic acid (RA) signalling. RA diffuses from the meninges into the posterior aspect of the cerebellum during development. Cyp26b1 codes for a cytochrome P450 enzyme that catabolizes retinoic acid into inactive metabolites. Cyp26b1 knock-out mice were found to exhibit severe craniofacial deformities, however, less attention has been placed on the hindbrain and its cell populations. To identify the spatial expression of Cyp26b1 during cerebellar development, Cyp26b1 transcripts were detected in mouse cerebellum at various embryonic time points using in situ hybridization. Cyp26b1 mRNA transcripts were found highly localized in the ventricular zone during E12.5-15.5. mRNA transcripts were also present rhombic lip, and external granule layer of the cerebellum during embryonic day (E) 14.5. These regions contain progenitors that are undifferentiated and highly proliferative. Since RA has been demonstrated to induce the differentiation of various neurons and glia, this suggests that Cyp26b1 in the cerebellum is maintaining the undifferentiated states of progenitor cells.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Cardiovascular Health Benefits of Exercise Training in Persons Living with Type 1 Diabetes

Presenter(s): Jacklyn Ku

Abstract

The relationship between exercise training and cardiovascular risk factors has been investigated extensively in type 2 diabetes; however, due to limited research, less is known about this relationship in persons living with type 1 diabetes (T1D). The aim of this study was to conduct a systematic review and meta-analysis of published clinical randomized, controlled trials on exercise training for cardiovascular risk factors in T1D. Electronic databases were systematically searched (from their inceptions to May 2017) and key reviews cross-referenced to identify articles for inclusion. Both randomized and non-randomized controlled trials reporting associations for exercise training and cardiovascular risk factors in T1D were included. Weighted mean differences (WMD) of each cardiovascular risk factor between exercise groups and control groups were calculated using a random effects model. Subgroup analyses were performed using the following variables, age, exercise frequency, type of exercise, and program duration to explore sources of heterogeneity. A total of 24 studies reported the effects of exercise training on cardiovascular disease risk factors. Exercise training increased and reduced glycosylated hemoglobin, daily insulin, and total cholesterol. Subgroup analyses showed greater beneficial effects in higher volume exercise interventions. Exercise training did not lead to consistent changes in body mass index, blood pressure, triglycerides, HDL-C, or LDL-C. In persons living with Type 1 diabetes, aerobic exercise training is associated with a beneficial cardiovascular profile, such as lower total cholesterol, daily insulin dosage and with better glycemic control and aerobic fitness. Future research should more carefully examine the minimal and optimal dosages of physical activity for health benefits in persons living with T1D.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Refining of rat approach-avoidance training

Presenter(s): Mengyi Hu

Abstract

Rats are widely used in behavioral studies. Behavioural tests are normally conducted during the day and under white light. Rats are nocturnal and find light exposure aversive; hence, exposure to white light is likely to cause stress that affects rat behavior. Behavioural tests often require rats to be trained for specific tasks. Prior to being tested for aversion to euthanasia agents in an approach-avoidance apparatus, rats are required to stay in a small lower cage for five minutes while eating 20 sweet rewards. Training rats to meet trained criteria in this setting is time-consuming and often only 75% of the rats reach criteria. This study aims to refine the training methodology of approach-avoidance, to improve efficiency. Red dim light is used instead of white light. The number of sweet rewards (cheerios) and latency before leaving sweet rewards during air exposure were measured. The average latency to leave the lower cage was observed. Rats vary in their responses to the training methodologies.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Assessing the Cognitive Impact of Smartphone Presence

Presenter(s): Paris Will

Abstract

From connecting with friends to shopping to banking to paying for parking, ubiquitous mobile technologies have revolutionized our lives. That tech has reshaped our day-to-day is undisputed, however, there is uncertainty around how our cognitive abilities may be affected by this shift. For example, there have been numerous claims made by several different groups of people including parents, policy makers, and educators regarding the deleterious effects of technology on cognition. Specifically, some researchers claim that screen based lifestyles are impairing brain development to be 'wired' for distraction. While there exists a lot of fear about this topic, and while this is a burgeoning field of study, the empirical evidence is currently lacking. The current project focuses very specifically around the question of whether the mere presence of a smartphone can negatively impact cognitive performance. Only a handful of other studies have addressed this specific question, and the results are conflicting. Thornton (2014) used cancellation and trail making tests and found that phone presence impairs attentional performance, but Lyngs (2017) failed to replicate these findings. This current study attempts to clarify the relationship of phone presence on cognition first by replicating previous results and second by investigating whether amount of technology use may be a moderating factor. We recruited high and low technology users, and manipulated phone presence while they completed a battery of cognitive tests and questionnaires. The present investigation adds some evidence supporting the negative effects of smartphone presence, but results overall are still inconclusive and further testing is needed.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Grief on the Farm: How Young Dairy Calves Respond to the Death of a Conspecific

Presenter(s): Charlotte Hursey

Abstract

The concept of non-human grief is a point of contention in the scientific community. While studies have been published that describe the reactions of animals such as African Elephants and Chimpanzees to the death of a conspecific, no such reports exist regarding farm animals. In this study, we described the behaviours of a group of 3-month old dairy calves reacting to the death of one of their pen mates. Through video analysis, we monitored three behaviours; proximity, exploration, and ear orientation. We recorded the incidence of these behaviours 120 minutes before death occurred, 60 minutes before death occurred, and 60 minutes after death occurred. We also compared reactions to the dead calf to those exhibited towards the same calf when it was previously sedated. We found that the incidence of all three behaviours increased during the death of the calf, and the number of calves within proximity and exhibiting ear orientation remained elevated during the hour following death. We also found consistent patterns in exploratory behaviour when comparing sedation and death, but differences in proximity and ear orientation. This brief inquiry into the reactions of dairy calves to death provides important information about the behaviour of dairy calves when responding to novel states of their conspecifics, and can be used to inform future studies into the reactions of domesticated animals to death.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: The Dagaare Low Vowels: a Possible Tenth Vowel in the Phonological Inventory of an Under-Studied Language

Presenter(s): Angelina Lloy

Abstract

Dàgáàrè is a language spoken in Ghana and Burkina Faso by approximately 1 million people, but despite this large number, it is not well studied. The Dàgáàrè vowel inventory has been described as consisting of 9 vowels: [i, ɪ, e, ε, u, ʊ, o, ɔ] and [a], which can be divided into two categories: advanced tongue root (ATR) vowels and retracted tongue root (RTR) vowels. Recent phonetic studies from our lab have demonstrated that the Dàgáàrè low vowel, recorded as a single vowel /a/, is actually pronounced as two distinct low vowels: one which is RTR, [a], and the other which is ATR, [ə]. Yet, it is still uncertain whether this tenth vowel is phonologically meaningful or 'contrastive'. If these two low vowels are contrastive, they have a role in distinguishing word meaning and if not, they are simply two phonetic variants of what is treated as the same sound. The present study uses phonological tests to determine whether the Dàgáàrè low vowels are contrastive, as are the other 8 vowels which have ATR/RTR contrastive pairs. To test this, we found minimal pairs, words which differ solely in their vowel quality, and modified them with prefixes. Using these and other words containing the low vowels, perceptual and acoustic analysis of audio recordings was then conducted. If results show that these vowels differ in pronunciation, this would indicate that Dàgáàrè has 10 phonological vowels, one more than previously thought. These results will aid in the understanding of an under-studied language.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: The Influences of Punjabi Marketplaces on the Identity of a City

Presenter(s): Eric Mann, Gagan Cheema, Gurleen Cheema

Abstract

A city's identity emerges from the culture native to that city. In this study, we investigate the role of the marketplace in representing the identity of a city. Marketplaces have historically been the predominant setting for the exchange of goods. Qualitative analysis at a select number of marketplaces entails articulating the culture of a particular marketplace, which includes observations and semi-structured interviews. These are to be conducted in four locations: Patiala, India; Amritsar, India; Vancouver, Canada; and Surrey, Canada. Interviews are to be conducted with marketplace vendors and local citizens to provide insight to the types of, and the popularity of, goods sold, and the cultural significance behind these items. Further, they provide insight on what the city is known for and why the citizens and vendors believe the marketplace is thriving as a cultural center. Combining results from the semi-structured interviews and our observations of marketplaces in all four locations, preliminary analyses reveal that marketplaces act as cultural markers. This research is to be conducted as part of an undergraduate research forum organized by the Go Global program at the University of British Columbia, and in collaboration with Punjabi University, Patiala. Our research will enhance understanding of the multiplicity of discourses that shape urban identity in Punjab, India.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Individual and Society

Title: Exploring how the infant brain processes non-human vocalizations using functional near infrared spectroscopy

Presenter(s): Mary Zhao, Garbo Lam

Abstract

Infants actively begin to learn language and gain an understanding of what is communicative within the first year of life (Jusczyk, 1997). Behavioural studies have demonstrated that neonates as young as 4 days old are able to differentiate between sentences in their native language and a foreign language, but not when these sentences are played backwards (Mehler et al., 1988). This provided early evidence that infant language processing is affected by an infant's language environment (e.g. exposure to native language) and young infants are able to recognize particular vocalizations (e.g. forward speech) as communicative. Whether or not this communicative learning is specific to intra-species human vocalizations is unclear. For families with dogs, it is possible that early exposure to dog vocalizations may alter the brain to treat such vocalizations as communicative as well. Our current study uses functional near infrared spectroscopy to explore infants' brain activity in response to forward and backward dog barks, as compared to forward and backward human speech. Thus far, preliminary data from 127 infants has been collected (M = 124 days old, 57 female vs. 70 male), 36 with dogs. Data analysis is currently underway; however, we anticipate that infants with pet dogs at home will show similar brain activation to forward dog barks as forward human speech (thus, treating dog barks as communicative).

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Information needs about the impacts of cancer treatment on pregnancy: A qualitative descriptive study of Reddit forums

Presenter(s): Ria Garg

Abstract

BACKGROUND

A woman's fertility can often be put at risk, while undergoing cancer treatments such as chemotherapy and radiation during reproductive years. Internet communities have become a place for cancer survivors to share their experiences. Therefore Reddit, a social news and media site, is a valuable resource to gain an understanding for this population.

OBJECTIVE

To conduct a qualitative descriptive study of posts on Reddit, to understand the information needs regarding fertility and pregnancy of women who have undergone cancer treatment.

METHODS

Data was gathered through searching posts on 4 subreddit sites - r/BabyBumps, r/Cancer, r/Infertility and r/TryingForABaby over a 5-year period from January 2014 to January 2019. All posts were reviewed for the following inclusion criteria: 1) comprised an original post and at least one response; 2) mentioned cancer treatment (chemotherapy and radiation); 3) mentioned concerns or asked questions regarding fertility, trying to conceive, and/or pregnancy. We will conduct a thematic analysis using line-by-line coding to generate initial codes, gathering codes into sub-categories and categories, and defining and naming themes.

RESULTS

Our search identified 900 posts. Preliminary thematic analysis has resulted in the following initial codes: 1) ability to naturally conceive post cancer therapy; 2) possibility of going into early menopause post cancer therapy; 3) fertility preservation and cancer treatment; and 4) empowerment and social support.

CONCLUSION

The impacts of cancer treatment on fertility and pregnancy are important issues for female cancer survivors. This study may better guide and support these women by identifying themes pertaining to their information needs.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Individual and Society

Title: A critical review of literature on the social media strategies of the anti-vaccination movement

Presenter(s): Derrick Sutanto

Abstract

Web 2.0 describes a stage of the world wide web where user-generated content comprises the principal medium of interaction between its users. The most prominent example of this phenomenon has been the rise of social media that facilitate the sharing of ideas through virtual communities of users. The role of social media in disseminating disinformation has been examined by researchers largely in terms of their technical aspects and the magnitude of their effects on some social behaviours. The results of such studies tend to be aggregative of highly specified variables in responding to specific and answerable research questions. This approach fails to contextually analyse Web 2.0's overall impact on the way users interact with deceptive information and content-generators. Our research addressed this by conducting a critical interpretive synthesis (CIS) of literature on the anti-vaccination movement's presence in social media. A CIS aims to further generate new concepts that can be used to improve methodology in answering open-ended research questions. This took the form of a systematic review that critically examined the assumptions about concepts and methods in studies on politically-charged online manipulation from the past 20 years. Our findings identified more useful terms of understanding the motives and factors that lead to successful disinformation through internet-based mediums.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Individual and Society

Title:

Presenter(s): Rae Wilson

Abstract

Our multidisciplinary research team is examining how Nanaimo Foodshare's Good Food Box program enhances nutrition, access to nutritious food, and the social well-being of the food insecure demographic. Research shows that improving access to nutritious food supports the physical and psychological well-being of individuals and their families while also creating positive community connections. Valued at seventeen dollars, the Good Food Box program offers a monthly box of fruits and vegetables to members of the community for ten dollars per month, which aids food insecure individuals in stretching their income and receiving healthy food on a monthly basis. Through our study, we conducted a nutritional assessment of the Good Food Box based on its contents, portions, and frequency of intake. Surveys and interviews with Food Box users and a dietician provided insight into how well the Good Food Box program is reaching individuals in need of the service. Our research suggests there is a need to understand the cultural diversity of the community in order to move beyond nutrition and support social well-being.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Outflow Analysis for Emergency Response and Environmental Assessment of Liquid Pipelines

Presenter(s): Ryan Stewart

Abstract

The completion of environmental assessment for liquid pipelines is becoming a concern in industry since many large projects are being subject to additional environmental review. Modelling of environmental impacts and completing a risk-based analysis or outflow scenarios could help expedite the environmental approval process, and also help companies with pipeline route selection and emergency response procedures. A desktop application written in a mathematical programming language is used to perform spill calculations using Bernoulli's equation. This program calculates the potential spill volumes along the route of a pipeline, while taking fluid properties, valve placement, turbulent flow, and elevation into account. The results provided from completing this program and performing a test analysis show it's quite simple to estimate spill volumes along a pipeline's route. The Bernoulli equation is easy to implement in a scientific programming language, and the program provides near-instant results. The results are easy to read and interpret, even for non-technical audiences.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Assessing the effect of nacelle tilt actuation on wind turbine dynamic loads

Presenter(s): Daniel Luo

Abstract

Wind is an unlimited, free and renewable source of energy. It is also one of the cleanest energy sources available. One of the drawbacks to wind power generation is that land suitable for wind turbine installation must compete with other uses for the land. Tackling this challenge requires increasing the generating capacity of each individual wind turbine by reducing the wake effect. The wake effect occurs when there is a series of wind turbines and the wind passing through each turbine decreases in energy such that the low speed wind (wake) experienced by downstream turbines contains less energy. This issue may be resolved by redirecting the low velocity wind downwards. A proposed method for redirecting the wake is to tilt the axis of rotation of the wind turbine rotor. The objective of this study is to understand the loading effect of tilting the axis of rotation of the turbine rotor. The method for conducting this study is to design a tilt mechanism, build a three-dimensional model of a wind turbine containing this tilt mechanism, and finally simulate the loads generated under different desired motion scenarios. The expected contributions of this study are to generate an accurate dynamic model for a wind turbine with a tilting mechanism, quantify the loads generated due to the tilt motion, evaluate the specific tilt mechanism used in this study, and finally, reach a conclusion on the viability of incorporating a tilting mechanism into wind turbines.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Continuous monitoring of spinal cord hemodynamics using an optical sensor

Presenter(s): Lorna Tu

Abstract

Current clinical guidelines suggest augmenting the mean arterial pressure (MAP) of acute spinal cord injury (SCI) patients during a week post-injury in order to improve spinal cord oxygenation and preserve neurologic function. However, it is difficult for clinicians to manage MAP without real-time physiological information on the effect of MAP alterations on spinal cord hemodynamics and oxygenation. To address this, we developed a non-invasive optical sensor based on near-infrared spectroscopy (NIRS). This well-established technology involves transmitting near-infrared light and then converting light absorption measurements into physiological parameters of interest. In this ongoing study, we investigate the feasibility and sensitivity of using NIRS as a spinal cord oxygenation and hemodynamics monitoring device by implanting a custom NIRS sensor into Yucatan pigs over a period of seven days after SCI. To validate the NIRS measurements, invasive intraparenchymal (IP) probes measuring oxygenation, blood flow, and tissue pressure are inserted into the spinal cord. Over the course of the experiment, nine changes in oxygen saturation and MAP are simulated to compare the measurements of the NIRS and IP sensors. The effect of these simulations was detected by both NIRS and IP methods, demonstrating that our novel NIRS sensor can monitor changes in oxygenation and hemodynamics within the spinal cord. Based on the observed signals, the NIRS sensor is able to capture responses of spinal cord hemodynamics to MAP changes. With further development, the NIRS sensor could become a clinically relevant device used by spine surgeons to monitor spinal cord hemodynamics and improve clinical MAP management.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: The application of Raman Spectroscopy to assess directed differentiation of hESC-derived pancreatic cells in transplantation

Presenter(s): Fennie Easton van der Graaf

Abstract

Current cell therapies for type 1 diabetes utilize islets harvested from human cadavers which limits the supply of cells for transplantation. Alternatively, directed differentiation of human embryonic stem cells (hESCs) to insulin-secreting cells, as under development in the Kieffer lab at UBC, can potentially provide an unlimited source of therapeutic cells. To ensure the safety and efficacy of the cell product, a strict validation protocol for each stage of the differentiation process must be implemented. Raman spectroscopy (RS) is a label-free, non-invasive optical technique that is gaining popularity in analytical applications involving process quality control and diagnostics. We use RS to biochemically characterize cells at different stages in the differentiation process. These analyses are used to assess the expected levels of important cellular proteins (e.g., insulin, glucagon), as well as glycogen, total protein and nucleic acid content of cells. A challenge in my measurements is that fluorescence leads to lower signal to noise ratio (SNR) which is problematic when analyzing the spectra. To overcome this, I use a suite of custom spectral preprocessing algorithms for noise and artifact removal, baseline correction, SNR-enhancement and other operations to permit more accurate characterization of cells. In my spectral measurements I have observed greater RS intensity of Insulin in cells nearing maturity, suggesting their therapeutic potential inside diabetic patients. This result indicates new applications of RS to assess functionality, purity, and potency of therapeutic cells in a variety of culture environments including plastic culture ware, bags, bioreactors, or immunoisolation devices.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: INVESTIGATING PAX3 TEMPORAL AND SPATIAL DISTRIBUTION IN THE DEVELOPING CEREBELLUM

Presenter(s): Erin Yang

Abstract

Malformation of the cerebellum is known to play a role in motor and non-motor disorders such as Fetal Alcohol Syndrome Disorder, Autism Spectrum Disorder, and ataxia, a loss of fine motor control. Though the cerebellum is crucial to central nervous system function, we lack a clear understanding of the genes underlying cerebellum formation. Using RNA transcripts collected from the cerebellum of mouse embryos, gene candidates for involvement in cerebellum formation were identified based on expression at specific temporal and spatial time points. Of these candidates, Paired box 3 (Pax3), was chosen to be validated in a biological context. Pax3 is in the paired-box family of transcription factors and balances maturation and migration of developing neural crest cells but has not been studied in the cerebellum. I looked at Pax3 transcript and protein distribution in the mouse embryonic cerebellum from the ages of E11 to E18 using in-situ hybridization (ISH) and immunofluorescence (IF) staining. I co-stained Pax3 with different neuronal progenitor cell-specific markers to study what cell types may be expressing Pax3. ISH and IF staining showed Pax3 transcript in cells of the germinal ventricular zone (VZ) as the cerebellum starts forming from E11, becoming more restricted to cells bordering the VZ in later embryonic days. The VZ is a progenitor zone that gives rise to GABAergic neurons, which comprise multiple crucial neuronal types in the mature cerebellum. The timeline and location of expression suggest that Pax3 is involved with GABAergic progenitors, likely Purkinje cell progenitors during cerebellum development.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Deep Learning for Optic Disc Segmentation in Diabetic Retinopathy Patients

Presenter(s): Edward Kim, Bitu Jokar, Yuting Wen, Kehong Liu

Abstract

Numerous eye diseases relating to the optic disc are found within the retina. The need for A.I. solutions to more efficiently and effectively recognize parts related to eye diseases have increased. One mode to perform this is segmentation, the division of an image into segments and pixel lining the segment that needs to be recognized. Deep learning is the process making building blocks known as a neural network to recognize a wider array of datasets. We use Keras, an open source neural network as part of our implementation. The purpose of our study is to create a more effective A.I. based image analysis solution using U-Net, considered to be the gold standard in biomedical image analysis, to segment optic discs associated with diabetic retinopathy. Data preparation was done using MATLAB and Python. The data used for our study is a public dataset provided by IEEE Dataport. The dataset has 54 test samples that we were able to use to train U-Net, for learning the appearance of the optical discs. After the test is completed U-Net will be able to recognize and segment the optical discs of any image not limited to the original dataset . One member received authorization to use the dataset for research purposes. The results of the study will not only allow for a more accurate and efficient imaging recognition techniques specific to the optic disc but also provide a pathway for the use of segmentation if various other tasks and industries.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: The Use of Robotics for Water Sampling

Presenter(s): Gina Majdzadeh, Nando Hernando, Yuebo Yao, Farrandi Hernando, Zhina Majd

Abstract

The capability of robotic fish for sampling in open water is discussed and compared with traditional procedure in which a group of people are sent for data collection. The available robots for water sampling are reviewed, and based on those an efficient model for robotic sampling is introduced. The suggested system utilizes a group of fish robots each for collecting water samples in a specific depth. Employing integrated sonar sensors, the distance between different fish robots within a given area is calculated to control the direction in which the robots move. A flexible algorithm is also needed to adapt the robots' direction in the case of extreme scenarios; the robustness of algorithm is crucial for the reliability of the system. The robots are mainly powered by solar energy while an auxiliary battery source is also provided for those working deep and not receiving enough sunlight. Using a group of robots decreases the operation time for water sampling in various ocean depths while it increases the financial cost.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Mutagenesis, Molecular Cloning and Transformation Efficiency of the Hyperpolarization-activated Cyclic Nucleotide-gated (HCN) channel

Presenter(s): Christian Francis

Abstract

The Hyperpolarization-activated Cyclic Nucleotide-gated (HCN) is a membrane protein that is expressed by excitable cells such as those found in the central nervous system as well as autorhythmic cardiac cells of the sinoatrial node (SAN). These voltage dependent channels exhibit a unique trait as the inward flow of Na⁺ and the outward flow of K⁺ directs the membrane potential towards the action potential threshold, which, in turn, activates Ca²⁺ channels and the firing of the next action potential. This study consisted of a site directed mutagenesis where a single mutation was made from serine to phenylalanine on the 100th amino acid residue of the human HCN1 (hHCN1) channel via Polymerase Chain Reaction (PCR). Subsequently, the plasmid with the mutant hHCN1 was transformed into XL10-Gold cells and plated to facilitate bacterial growth. The plasmid was purified through a Mini-prep and Sanger sequencing was done to confirm the mutation. This mutation has been documented as a genetic characteristic of individuals with epilepsy. The excitation of neurons is fundamentally managed by HCN channels, therefore mutations may result in abnormal protein structure or bioelectric activity. In future investigations, the wildtype and mutant channel will be tagged with GFP, "a fluorescent protein," and then expressed in several mammalian cell lines such as *Xenopus* oocytes and Chinese hamster ovary cells to determine the transfection efficiency and protein localization by confocal microscopic imaging. The effects of this mutation on protein structure will also be investigated through computer modelling and cryoEM.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Geographical Morphological Variation in Gentoo Penguins

Presenter(s): Jessica Ye

Abstract

Identifying the sex in Gentoo penguins (P. Papua) is essential for monitoring behavior in field studies. Determining the sex of Gentoo penguins through visual cues is difficult due to their monomorphic plumage, however morphometric techniques give instant results of sex estimates in the field. Prior to analysis of morphometric data, the degree of geographic morphological variation between colonies must be determined. Morphometric data was collected from Gentoo penguins (n=66) on the Falkland Islands in colonies 20km apart, Race Point (RP) and Pebble Island (PI). The aim is to determine variation for characters (flipper length, mass, bill length, and bill depth) between each colony to assess the need for analyzing each colonies' morphometric data independently. R.Studio was used to transpose the data from PI and RP on a covariance matrix, which returned four component scores. A biplot was then generated for the two colonies, which showed that bill length and bill depth have the most morphological variation between sexes. 7 of the 66 penguins were mis-identified when the two colonies were combined to determine sex using morphometrics, with an error rate of 10.66%. Although morphometrics are a useful tool for giving estimates of sex in the field efficiently, this technique needs to be used with caution, as colonies only 20km apart vary greatly in morphometric characters.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: The Effects of Gentle Handling in Reducing the Fear of Laboratory Rats Undergoing Repeated Oral Gavage

Presenter(s): Kristine Wong

Abstract

Handling can cause significant changes in the stress physiology and behaviour of captive animals which can negatively impact their health and welfare. The ways in which scientists interact and handle research animals can often be overlooked. Our research aimed to determine the effects of gentle handling in reducing fear in laboratory rats undergoing repeated oral gavage procedure. We hypothesized that on the days that oral gavage occurred, more rats would perform behaviours (such as hiding or retreating from handlers hands) that indicate they found the procedure aversive. Over a three week period, 18 adult Sprague-Dawley rats were handled by two trained researchers. Socialization protocol lasted for 10 minutes per cage and consisted of introducing hands into cage and letting rats smell hands, talking to the rats, gently stroking their backs, and gently scooping them into arms. The results demonstrated a beneficial effect of gentle handling: the proportion of rats that ran away from the hand when being scooped and that hid for most of the socialization period decreased 67% and 41% respectively after only four days of gentle handling. In contrast to our hypothesis, the rats did not show a reappearance of these fearful behaviours on the days oral gavage occurred. We conclude that socialization reduced indicators of fear after four days and these indicators remained low during oral gavage procedures. The implications of consistent gentle handling may allow for easier behavioural testing, better data collection, and overall improved animal welfare.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Relationship Between Stream Discharge and Dissolved Oxygen Levels at Canyon Creek, and Implications Towards Salmon Development and Physiology

Presenter(s): Yalda Hosseini, Crista Rosenberg

Abstract

Dissolved oxygen levels below a critical concentration can have detrimental effects on the performance and proper physiological function of salmon species. It was proposed that stream discharge could be correlated to the concentration of dissolved oxygen present in streams inhabited by salmon. In the current study, the objective was to determine if there was a correlation between stream discharge (m^3/s) and dissolved oxygen levels (mg/L) by obtaining measurements at three ripple-water and three still-water sites on two separate days. A significant positive correlation was determined between stream discharge and dissolved oxygen levels at the West Canyon Creek using the Pearson's r correlation test, with $r=0.7392$ and a p -value of 0.006 . Given these findings, it would be of interest to further study whether the current dissolved oxygen concentrations have a direct effect on salmon development and physiological performance, and the subsequent indirect effects on the surrounding ecosystem.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Effects of Salinity on the Population Growth of *Chlamydomonas reinhardtii*

Presenter(s): Cyndi Yan, Portia Chen

Abstract

As we are living in a world that is becoming increasingly saline due to the anthropogenic effects of climate change, it is important to understand the effects of salinity on our ecosystem. Increasing temperatures due to climate change is expected to increase irrigation of farmland and water evaporation (Edwards, 2016), leading to increases in salinity in soil and waters (Utset & Borroto, 2001). Learning how *Chlamydomonas reinhardtii*, an abundant green alga that is one of the main sources of food for salmon, behaves in increasingly saline conditions will help us understand effects of salinity on organisms' dependant on *C. reinhardtii*, such as salmon. To do so, the growth rate of *C. reinhardtii* was tested over the course of two weeks under varying concentrations of NaCl. Given previous research, we predicted that the 0 mM NaCl sample will have the highest rate of cell growth, and lowest growth rate will be observed at 150 mM NaCl. This experiment allowed us to find support for our hypothesis and conclude that there was a significant interaction between salinity concentrations and cell growth. Specifically, as salinity increases, the cell growth rate of the *C. reinhardtii* will decrease. Based on this, as climate change continues, we must work to maintain the low levels of salinity within the waters of our ecosystem in order to allow the *C. reinhardtii* to thrive and continue to provide plentiful food sources for the keystone species, salmon.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: A UV-LED based wastewater treatment proposal to reuse pulp and paper wastewater as irrigation water

Presenter(s): Simeng Li

Abstract

Every year, the pulp and paper industry generates a large amount of wastewater containing organic pollutants and heavy metals. These pollutants impact negatively on health and environment, so they need to be removed before discharge. As a widely studied water treatment method, ultraviolet irradiation is a promising technology due to its effective inactivation of microorganisms and removal of micropollutants, and lack of disinfectant residual. This research aims to design a process to treat wastewater from the pulp and paper industry with ultraviolet light emitting diodes (UV LEDs) to reuse it for agricultural purposes. A literature review was conducted to determine the method used in each step to remove different pollutants. In the designed process, the wastewater first goes through a primary treatment including coagulation and filtration to chiefly remove suspended solids. It then flows through granular activated carbon to remove metals. A photo-reactor equipped with 275nm 100mW UV LEDs finally degrades more than 80% organic pollutants from wastewater. This research may provide some insights into the procedure for treating wastewater from the paper industry with UV-LEDs to meet irrigation water standards and other water standards.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Transpiration and Chlorophyll levels over seasonal changes in American Sweetgum (*Liquidambar styraciflua*) and Hungarian Oak (*Quercus Frainetto*) and the effect of environmental conditions on Japanese Katsura (*Cercidiphyllum Japonicum*)

Presenter(s): Garvit Bhatt, Alex Jimenez

Abstract

The environmental aspect of sustainability has become an increasingly important topic due its impact on climate change and carbon sequestration processes. A diverse variety of tree species act as a living laboratory that can be used to investigate the effects of environmental factors on the growth, development, and physiology of plants. Therefore, it is important to identify, analyze and assess the effects of seasonal changes and environmental factors on the relative efficiency of various plant species in carbon sequestration, transpiration and leaf chlorophyll levels. In this study, leaves were collected from older and younger generations of American Sweetgum (*Liquidambar styraciflua*) and Hungarian Oak (*Quercus frainetto*) trees. In addition, leaves from stressed and non-stressed environments of Japanese Katsura (*Cercidiphyllum japonicum*) were also assessed. The three species were analyzed from May to November 2018. The photosynthesis, transpiration rates and chlorophyll levels were measured weekly for a total of 14 weeks with the CI-340 Hand-Held Photosynthesis System and a Chlorophyll meter respectively. Additionally, the relative changes in leaf protein profiles and the levels of light-harvesting complex proteins in each of the leaves will be analyzed. This investigation can be further extrapolated in different tree species which can be planted on campus according to the measure of the highest photosynthesis rate as to increase sustainability and obtain a greener campus. Moreover, the analysis of stressed and non-stressed leaves of the Japanese Katsura gives insight on how leaves behave during changing environmental conditions that can be used to further investigate stress-induced developmental changes in leaves.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: OCEAN ACIDIFICATION AND WARMING AFFECTS BOTH THE FUNCTIONAL AND ABSOLUTE LIFESPAN OF A MARINE TREMATODE PARASITE

Presenter(s): Veronika Franzova

Abstract

Human activities are causing an increase in atmospheric CO₂, leading to unprecedented environmental change including increases in seawater temperature and decreases in seawater pH (ocean acidification). It is vital that the effects of these changes on marine organisms be explored so that we may predict how marine communities may be altered. In particular, the effect of CO₂-mediated environmental change on trematode parasites is a pressing area of research, due to the lack of knowledge in this area relating to these ecologically important parasites. We conducted an experiment examining the effect of warming and ocean acidification on an echinostomatid trematode from Vancouver Island, British Columbia. Specifically, we quantified the longevity of the free-living cercarial life stage, which is related to the probability of transmission to the secondary host. We found increased temperature to negatively affect this echinostomatid species, as cercarial longevity was highest at 5 °C and decreased with increasing temperature up to 40 °C. The effect of CO₂ was most pronounced at lower temperatures, with increased pCO₂ causing decreased longevity in some cases. These results indicate that changing oceanic temperature and pH may affect the longevity of cercariae and consequently impact infection success. Because trematode parasites are important members of intertidal communities whose presence or absence can regulate the abundance of host species in the system, a change in infection success of trematode cercariae due to climate change could significantly affect many marine intertidal communities.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: The effect of mineral oil on the CO₂ concentration of *Chlamydomonas reinhardtii*'s environment over time

Presenter(s): Sarah Casciato, Nav Dhaliwal, Simran Brar

Abstract

Oil is a common water pollutant that is released into the environment through spills which can harm marine ecosystems. As oil spreads out over the water surface, the diffusion of CO₂—which is required by *Chlamydomonas reinhardtii* for photosynthesis—becomes inhibited. This experiment investigated the effect of mineral oil on the CO₂ concentration of *C. reinhardtii*'s environment. We performed titrations on samples of *C. reinhardtii* that we treated with mineral oil to find the concentration of CO₂. The control group had the greatest change in CO₂ concentration over time, while the full oil treatment had the lowest. The mean CO₂ concentrations were 77.83 ppm for the control group, 53.67 ppm for the partial treatment, 49.08 ppm the half treatment, and 44.42 ppm for the full treatment. A two-way ANOVA revealed our results to be statistically significant for both time ($p=2.9 \times 10^{-4}$), treatment ($p=6.0 \times 10^{-5}$) and the interaction between the two (2.2×10^{-16}); thus, we can reject all three null hypotheses. It is possible that the metabolic rates of *C. reinhardtii* were reduced due to the toxicity of aromatic hydrocarbons found in oil, although there was some growth over the 7-day period of the experiment.

WAVE 3 | POSTER PRESENTATIONS

ABSTRACTS | 2:00PM - 3:10PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Sustainability and Conservation

Title: Is Burned-Area of Forests predictable?

Presenter(s): Alice Zhang

Abstract

The forest fire is a challenging problem in Canada and especially for the province of BC that owns about 60 million hectares (149 million acres) of forested land. Since an advanced alert system concerning the seriousness of wildfire plays an essential role in decreasing the damage of wildfires, a predictable model of wildfire is a must. To adjust the relationship between environmental variables and area burned each year, a multiple linear regression model was fitted. I used Maximum mean monthly temperature ($^{\circ}\text{C}$), maximum mean monthly precipitation (mm) and total snow (cm) as the predictor variable and burned area as the response variable.

WAVE 4 | ORAL PRESENTATIONS

LIST | 3:20PM - 4:30PM

Ponderosa Commons: Oak House, 6445 University Boulevard

PCOH 1001

Contributing effect of bilitercy on third language acquisition among young adults in a university setting Maria Samarskaya

Identifying genetic biomarkers associated with sepsis survival in order to predict sepsis patient mortality rates CK Wong
Zohaib Nadeem

Patient Reported Outcomes (PROs) from Renal Transplant Donors and Recipients: Initial Results from Single Center Keesha Khehra

Resolving π -type halogen bonding interactions for intermolecular electron transfer Andrew Wang

Healthy Living Counselling in Two Outpatient Pediatric Sub-specialty Clinic - A Retrospective Chart Review Dhruv Pandey

PCOH 1002

Chemoreception in Steller sea lion foraging Johanna Fee

Confidence correlates to work efficiency Prabh Dhindsa

Evaluation of the relationship between oral manifestations of psoriasis and other confounding variables Zeba Khan

Predicting Wildfires: An investigation of species-specific responses to drought and how it is quantified in order to predict the risk and behavior of wildfires. Jessica Brown
Rochelle Maher

PCOH 1003

Mental health outcomes in medication-assisted substitution treatment for opioid use disorder: a systematic review of randomized clinical trials	Kimia Ziafat
Effects of mechanical agitation on cold-stored platelet in vitro characteristics	Angela Chuang Rachel Cheng Ruwanva Gunawardana Emily Kon
Development of an Expandable Airlock for a Martian Settlement	Kyle Marquis Garnet Butcher Yash Adnani Jacky Jiang
Itineraries of a Himalayan Pilgrimage: Infrastructural Impacts on Religious and Environmental Experience	James Binks
Synthesis of Novel Coumarins as Potential Antibiotics	Melynda Bergen

PCOH 1008

Localization of Stimuli in Emotional Contexts	Lana Sodol Haslin Park
The effect of dot-size variance on children's biases in numerical discrimination tasks	Manish Toofany
Impact of the Emotionality and Vividness of a Crime on Eyewitness Memory	Alyssa Lorenz Tianqi Peng Queenie Zhang
Sustaining Project Bhangra: A Bhangra dance intervention for South Asian children	Simran Gill Inderpreet Basra Pravnit Kooner

PCOH 1215

The Peptidisc: a method for stabilizing membrane proteins	Jeff Chen
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Neuropsychological Performance as a Predictor of Treatment Response Ananya Sandhu

Transfer of Cognitive to Academic Outcomes of the Arrowsmith Program Larissa Chiu

Dopaminergic Neuron Degeneration and Resultant Behavioral Defects Caused by Mutations in Homologs of PD-Associated Genes in C.elegans Desta Rabin

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: contributing effect of biliteracy on third language acquisition among young adults in a university setting

Presenter(s): Maria Samarskaya

Abstract

In such a linguistically diverse country as Canada, biliteracy has become prevalent with the growing bilingual population. This reality has established multiliteracy a societal framework, which celebrates diverse literacy practices, hence making it a prevalent area of interest. In academic writings the effects of biliteracy on the acquisition of a third language have been widely contested. This study seeks to determine the contributing effect of biliteracy on third language acquisition among young adults in a university setting. This study will employ both primary and secondary research methodology. For primary research, a survey of a classroom of individuals learning foreign language is conducted. This is done by means of sample-based data gathered from individuals at the studying a foreign language in a university setting. Through the analysis of the data multiple regression will be utilized. The primary data gathered is compared to the both sides of the conflicting, longstanding academic discourse. Based upon a meta-analysis of academic studies, the hypothesized results would consist of biliterate individual being able to learn a third language more effectively than their monliterate counterparts. This is due in part to strengthened domain-general cognitive processes of biliterate individuals, as well as independent factors previously discussed. Implication confirming that biliteracy is indeed beneficial to third language learning can be applicable to influence post-secondary language classroom settings as well as highlight the importance of maintaining multiliteracy.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Identifying genetic biomarkers associated with sepsis survival in order to predict sepsis patient mortality rates

Presenter(s): CK Wong

Abstract

Sepsis is a medical condition whereby the body's immune system overreacts to a pathogenic trigger, often to the point where the immune response may be more damaging to the body than the infection itself. In the United States alone, nearly 270,000 people die annually as a result of sepsis. Lipopolysaccharides (LPS) are a type of lipid molecule found in the cell walls of a certain class of bacteria known as Gram-negative bacteria, and because of this LPS is a potent sepsis trigger; the human immune system recognizes the presence of LPS as an indicator of infection by Gram-negative bacteria. The phospholipid transfer protein (PLTP) plays a key role in the elimination of LPS from the bloodstream, which has implications on sepsis survival and recovery. We hypothesize that septic patients carrying variants of the PLTP gene which confer higher levels of PLTP in the blood and/or greater PLTP activity may have improved sepsis survival rates compared to non-carriers. Nine genetic variants of the PLTP gene, also known as biomarkers, will be included in our analysis. We will compare how these genetic biomarkers influence the 28-day and 90-day survival of 3684 septic patients from the UK Biobank cohort using Cox-proportional hazard ratios. Results will be adjusted to account for possible covariates such as age, sex, genotyping batch, and genetic ancestry. Identifying genetic biomarkers which may serve as predictors of sepsis survival might improve patient triage, and might also lead to the development of sepsis-specific therapies.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Identifying genetic biomarkers associated with sepsis survival in order to predict sepsis patient mortality rates

Presenter(s): Zohaib Nadeem

Abstract

Sepsis is a medical condition whereby the body's immune system overreacts to a pathogenic trigger, often to the point where the immune response may be more damaging to the body than the infection itself. In the United States alone, nearly 270,000 people die annually as a result of sepsis. Lipopolysaccharides (LPS) are a type of lipid molecule found in the cell walls of a certain class of bacteria known as Gram-negative bacteria, and because of this LPS is a potent sepsis trigger; the human immune system recognizes the presence of LPS as an indicator of infection by Gram-negative bacteria. The phospholipid transfer protein (PLTP) plays a key role in the elimination of LPS from the bloodstream, which has implications on sepsis survival and recovery. We hypothesize that septic patients carrying variants of the PLPT gene which confer higher levels of PLTP in the blood and/or greater PLTP activity may have improved sepsis survival rates compared to non-carriers. Nine genetic variants of the PLTP gene, also known as biomarkers, will be included in our analysis. We will compare how these genetic biomarkers influence the 28-day and 90-day survival of 3684 septic patients from the UK Biobank cohort using Cox-proportional hazard ratios. Results will be adjusted to account for possible covariates such as age, sex, genotyping batch, and genetic ancestry. Identifying genetic biomarkers which may serve as predictors of sepsis survival might improve patient triage, and might also lead to the development of sepsis-specific therapies.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Patient Reported Outcomes (PROs) from Renal Transplant Donors and Recipients: Initial Results from Single Center

Presenter(s): Keesha Khehra

Abstract

Patient reported outcomes (PROs) are gaining popularity in various medical disciplines as a mechanism to improve accountability and patient-centered care. PROs are a way to collect information about a patient's health condition directly from the patient without interpretation from a healthcare professional. PROs can be effective tools for characterizing symptom burden and health-related quality of life. Medical guidelines for many treatments do not account for variation in patients and provide large ranges for recovery and potential symptoms. The objectives of this study are to understand the common symptoms of post-operative kidney transplant patients using PROs and develop evidence-based guidelines for recovery. Since initiating the study in June 2018, 50 patients at Vancouver General Hospital have been recruited. After their operation, patients are asked to complete a recovery survey daily on the ward until discharged, weekly at the postoperative clinic, and then monthly for the remaining six-month period. Initial results show that recipients are most concerned about the operation going well, graft rejection, sleep, pain, fluid overload, and bowel movements. Donors are most concerned about pain and bowel movements. Some key findings include majority of recipients will not have an elevated temperature after day three, a third of recipients have a bowel movement by post-op day two, and 70% recipients are able to do short walks by day two. Longer term analysis is needed to evaluate the usability and applicability of PROs into clinical practice. Next steps are to increase recruitment, reduce variance through increased compliance, and compare results with clinical guidelines.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Resolving π -type halogen bonding interactions for intermolecular electron transfer

Presenter(s): Andrew Wang

Abstract

Through the lens of chemistry, one can improve the understanding our world by studying the fundamental interactions between molecules. In addition, one can also use the findings of fundamental research as the groundwork for new applications to push the frontiers of science and technology. To this end, I have explored how a unique intermolecular interaction, halogen bonding, can accelerate electron transfer between molecules. Electron transfer is a fundamental process in chemistry because the properties and behaviour of atoms and molecules are governed by the distribution of electrons around them. Understanding the properties and behaviour of atoms and molecules not only allows us to appreciate how our world works on a molecular level, but the knowledge gained also serves as a tool that one can apply towards designing chemical systems for novel applications (i.e. solar cells). Previous work in our group have established that halogen bonding can accelerate intermolecular electron transfer rates. However, the specific mechanism of this process remains unresolved. In this talk, I will discuss how halogen bonding can enable accelerated electron transfer through a " π -type" geometry. I support this claim using experimental results from transient absorption spectroscopy and computational modelling using density functional theory. As this " π -type" intermolecular interaction has never been explored, it not only enhances our understanding towards intermolecular electron transfer, but also provides new avenues towards further research and novel applications.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Chemoreception in Steller sea lion foraging

Presenter(s): Johanna Fee

Abstract

Many animals, both marine and terrestrial, rely on olfactory sensing of chemical cues to locate prey. The use of olfaction in marine mammals poses a unique problem as they are evolved to breathe air, but hunt in an aquatic environment. Steller sea lions (*Eumetopias jubatus*) are marine mammals that forage and hunt at depth; their aerobic dive limit is on the order of several minutes. Sea lions use a variety of tactics to sense their prey while submerged: they have eyes adapted to see underwater, and hollow vibrissae (whiskers) on their face to detect movement of water, vortices and hydrodynamic trails caused by their prey. These sensory modes are functional but limited; vision is decreased by turbidity of water and decreased light conditions at depth, and sensing of water movement by vibrissae is decreased by interference in water. It is currently unknown if Steller sea lions have the ability to detect chemical cues while underwater or in air. Over the past 8 months the focus of this project has been developing a novel protocol to train captive Steller sea lions to discriminate between olfactory stimuli using positive reinforcement in air that could then be transferred to water trials. Once trained the sea lions' ability to discriminate between olfactory stimuli will be tested in trials consisting of randomly generated presentations of trained scents. This study investigates sea lions' ability to detect chemical cues in air and underwater and may elucidate how they detect prey during foraging.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1001 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Healthy Living Counselling in Two Outpatient Pediatric Sub-specialty Clinic - A Retrospective Chart Review

Presenter(s): Dhruv Pandey

Abstract

We aim to develop a healthy living counselling toolkit for healthcare providers at BC Children's Hospital. To understand current practices, we conducted a retrospective chart review examining documentation of lifestyle counselling in the Oncology Long-term Follow-up (OLTFU) and Multi-Organ Transplant (MOT) clinic. Both populations are at risk of obesity and post-transplant diabetes respectively.

A random sample of patients who had 1+ visits in 2016 included 227 OLTFU and 37 MOT charts. Data abstraction occurred via REDCap, and recorded anthropometric measurements, healthy living discussions, and referrals made to specialized programs to address these behaviours.

In OLTFU patients who had 1 visit (n=151), 95% of height/weight measurements and 24% of BMI calculations were recorded. 62% of these measurements were plotted on WHO growth charts. In OLTFU patients who had 2+ visits (n=76), 89% for height/weight measurements, 12% for BMI calculations, and 39% for growth chart plotting were recorded. As most MOT patients had 2+ visits (n=34), 88% height/weight measurements, 53% BMI calculations, and 56% growth chart plotting were recorded. 19% of OLTFU charts had documented discussions of healthy living compared to 92% of MOT charts. 3% of OLTFU patients received a referral to a specialized centre compared to 14% of MOT patients.

Our findings demonstrate that although anthropometric measurements are recorded, BMI calculations and growth chart plotting occur less often. 15% of patients in both clinics who had a discussion on healthy living received a referral to a program to address healthy living behaviours.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Confidence correlates to work efficiency

Presenter(s): Prabh Dhindsa

Abstract

Does being confident matter for work efficiency? In this research, we explore whether basketball players made or missed their first attempt in shooting would affect their personal performance in a game. We handcoded the first shot (1=made, 0=missed) of the top player from each of the 30 American National Basketball Association (NBA) teams across 82 games during the 2017-2018 season and merged the data with the NBA player game statistics. We found that players who made their first shot were shooting a significantly higher percentage (51%) from the field in a game than when they missed their first shot (42%). Scoring the initial shot provides players with more confidence through the course of the game, which has a direct impact on their productivity.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Evaluation of the relationship between oral manifestations of psoriasis and other confounding variables

Presenter(s): Zeba Khan

Abstract

Psoriasis is a chronic, recurrent and inflammatory disease that significantly reduces the quality of life. Studies show that there is a high prevalence of oral lesions in patients with psoriasis compared to control patients; however, the manifestation of psoriasis in the form of oral lesions is still a matter of controversy. Understanding the association of psoriasis and oral lesions is critical for its proper treatment. Oral lesions due to psoriasis and other inflammatory diseases or the oral mucosa are hard to distinguish, which may result in misdiagnosis and mistreatment of oral lesions. We conducted a study to investigate the effect of several confounding factors on the presence of oral lesions in patients with psoriasis. We collected data from 100 patients between the ages of 20-80 years old who presented to the Razi Hospital in Iran with diagnosed psoriasis and oral lesions. Demographic information was collected through a survey in our cross-sectional study design and the participant's tongues were examined for oral lesions. Various types of oral lesions and its relationship to factors such as gender, age, duration of disease, smoking, nail and joint manifestation of psoriasis, co-morbid diseases and the score on the Psoriasis Area and Severity Index (PASI), in patients with psoriasis was investigated in our study. Our results indicate that co-morbid diseases such as diabetes thyroid diseases and cardiovascular diseases, are associated with the manifestation of oral lesions. Other investigated variables demonstrated no relationship with the manifestation of oral lesions.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1002 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Predicting Wildfires: An investigation of species-specific responses to drought and how it is quantified in order to predict the risk and behavior of wildfires.

Presenter(s): Jessica Brown, Rochelle Maher

Abstract

The cost of wildfires in British Columbia in 2017 is estimated at \$568 million (Wildfire Averages, Government of British Columbia). The level of drought is an important factor regarding the risk of wildfires and is assessed quantitatively by the BC Wildfire Service in order to make accurate predictions about fire behavior.

Precipitation, soil moisture index and temperature are taken into account, but not the species of tree or fuel type present. In order to investigate if the species of tree should be taken into account in predicting the level of drought, three samples each of eight different species representing five prominent fuel types in BC were saturated and dried in order to assess species-specific response to drought. The results showed that while the rate of water loss is the same, water uptake levels vary significantly among species, which ultimately creates species-specific drying times upon exposure to the same precipitation levels. Therefore, we concluded that the current method for computing drought is incomplete and proposed an adjusted method that incorporates species and fuel type. This means that fire risk can be assessed with greater accuracy which is critical for effective deployment of resources and fire suppression.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Mental health outcomes in medication-assisted substitution treatment for opioid use disorder: a systematic review of randomized clinical trials

Presenter(s): Kimia Ziafat

Abstract

There is a dearth of systematic evidence on the effectiveness of opioid agonists in improving mental health in opioid use disorder. Randomized clinical trials were included in the review if they compared opioid agonists with each other or a placebo in substitution treatment of opioid use disorder and reported at least one mental health outcome using a validated measure. Studies with comprehensive psychiatric interventions or those primarily focused on other adjunctive interventions were excluded. In September 2018, we did a systematic literature search with the following keywords: opium, opioid, heroin, medication assisted, substitution treatment, maintenance treatment, methadone, buprenorphine, suboxone, morphine, dihydrocodeine, hydromorphone, opium tincture, methadol, methadyl, trial, random, placebo, depress, anxiety, mental, psychiatric. Of the total 6034 citations retrieved, 27 published studies have been included in the review. Studies varied considerably regarding dropout rates, dosing, psychosocial services, duration, and severity of opioid use disorder. Risk of bias was moderate to high in most studies, 5 studies assessed mental health status but did not provide the results, and others mostly provided insufficient data to make a meta-analysis possible at this time. Overall, it appears that opioid agonists improve mental health measures significantly during treatment, and are superior to placebo or waitlist; however, at this point, it is unclear if a particular opioid agonist is superior to another. Considering the extent of mental health problems in the opioid-dependent population and that substitution treatment comprises the mainstay of treatment options, more attention is required toward mental health outcomes in such clinical trials.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Effects of mechanical agitation on cold-stored platelet in vitro characteristics

Presenter(s): Angela Chuang, Rachel Chang, Ruwanya Gunawardana, Emily Kon

Abstract

Platelets, also called thrombocytes, are small anucleate cell fragments that play a crucial role in coagulation. In response to injury, platelets are activated to stop bleeding. Currently, platelets are stored at room-temperature with constant agitation for only 7 days in Canada. Such short shelf life leads to significant platelets wastage amounting to 5 million dollars per year. In this study, cold stored platelets are investigated in hope to extend platelet storage shelf life. In addition, mechanical forces in cold stored platelets may also prevent the decrease in platelet count during storage. Platelets from healthy donors were stored at either 22°C with agitation or 4°C with or without agitation. The platelets were monitored periodically throughout 14 days with regard to their platelet count, blood gas analytes, surface marker expression and aggregation response. The results from the in vitro analyses confirmed that 4°C platelets possess better hemostatic properties than room temperature (RT) platelets. However, they possess lower platelet counts and slower metabolisms compared to RT platelets. Additionally, it was determined that there were no statistical differences between shaken (4S) and non-shaken (4NS) cold platelets. These results suggest that as agitation plays no significant role in maintaining cold-stored platelet quality, the need for an agitator for cold-stored platelets can be eliminated. From these results, we believe that cold stored platelets can be a superior product for actively bleeding patients.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Development of an Expandable Airlock for a Martian Settlement

Presenter(s): Kyle Marquis, Garnet Butcher, Yash Adani, Jacky Jiang

Abstract

With the recent expansion of space exploration industry, there is an opportunity to develop technologies to sustain human life on other planets. Our team has researched and designed a functional, expandable airlock with assembly and testing currently underway for a full-scale prototype. The airlock is designed to survive in the Martian atmosphere: satisfying the pressure difference of 1 atm as well as temperatures below 173 K. A multilayered metallocene polyethylene (mPE) membrane was selected to meet design requirements for flexibility, sealability, and impermeability at these conditions. mPE membrane is commonly used for packaging in the food industry. Furthermore, an innovative system of ultra-high-molecular-weight polyethylene (UHMWPE) ropes create a lightweight flexible structure that can safely withstand 1 atm of gauge pressure. A door has been designed to distribute roughly 200 kN of force to the frames of the structure while implementing a dynamic seal. Redundancy is integrated through all major systems, including structural layers, airtight seals, and electrical sensors. Electronic airlock systems are controlled by interconnected, off-the-shelf microprocessors and sensors. Improvements to the design and further areas of development are explored: Optimization of the aluminum frames, door, and base could enable significant reduction of mass in non-critical areas. The dynamic seal should be followed up with reliability testing in expected environmental conditions. Lastly, improved floorboards would ideally fold into a smaller area, and passive actuators would be designed to work at worst-case temperatures without constant heating. Overall, our team's work demonstrates a practical approach to create expandable airlock modules, which could find use on initial human expeditions to Mars.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Itineraries of a Himalayan Pilgrimage: Infrastructural Impacts on Religious and Environmental Experience

Presenter(s): James Binks

Abstract

The popular Hindu Himalayan 'Char Dham' pilgrimage in India draws more and more travellers to its four-temple circuit every year. While prior research has focused on the development of the pilgrimage's infrastructure and single-sited significance of place, this study takes a mobilities approach that interrogates the range of sensory and kinaesthetic (phenomenological) experiences of pilgrims as they utilize types of infrastructures to travel along the whole route. Based on three months of multi-sited participant observation travelling alongside groups of pilgrims, the study included interviews with tour operators and pilgrims en route, in addition to sound recordings of the natural, vehicular, and social environments that comprise the aural atmosphere of the pilgrimage. Preliminary findings suggest that infrastructures not only mediate one's ongoing relationships with the pilgrimage's religio-natural environments - the infrastructural tools (e.g. itineraries, vehicles, phones) one uses to enact the process of travel agentively shape the environments themselves. These environments become places and spaces in which the pilgrimage's religious and natural power are expressed, and thus experienced by pilgrims in differently threaded embodied and social forms.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1003 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Synthesis of Novel Coumarins as Potential Antibodies

Presenter(s): Melynda Bergen

Abstract

Multi-drug resistant bacteria are of rising concern, leading to the importance of continued development of novel antibiotics. Contemporary medicinal chemists use an ever-growing knowledge base of structure-function relationships to design and synthesize new antibiotics-potentially with fewer or less severe side effects, or against antibiotic resistant strains of bacteria. Coumarins are a family of organic compounds, produced by many plants, that are known to have anticancer, anti-inflammatory, and antimicrobial activity. A number of coumarin derivatives are now commonly used as antibiotics, namely clorobiocin, coumermycin, and novobiocin. The purpose of this research was to develop novel coumarins and determine if these compounds exhibit antimicrobial properties. A library of five novel coumarins was developed, where compounds were synthesized, purified, and characterized. The structures and purity of the novel compounds were assessed using infrared spectroscopy and nuclear magnetic resonance spectroscopy. Subsequently, a disc-diffusion inhibition assay was used to determine antimicrobial activity of the compounds. This assay resulted in one novel coumarin-7-phenoxy-4-phenylchromen-2-one-demonstrating antimicrobial activity at various concentrations, with a 9 +/- 1 mm zone of inhibition toward gram-positive bacteria. These results demonstrate that novel coumarins are an exciting family of compounds for continued medicinal chemistry research.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Localization of Stimuli in Emotional Contexts

Presenter(s): Lana Sodol, Haslin Park

Abstract

Emotions are a key aspect of experience in our daily life that influence our perception of stimuli and task performance. Particularly, spatial perception is affected not only by emotional information, but also by which sense we receive the information. However, the nature of this interaction is not fully understood.

In the current study, participants were asked to find which angle the target (dot or beep) was presented at, while an emotional distractor (faces or sounds) was presented at varied times (simultaneously with target presentation or with response screen). With simultaneous presentation of target and distractor, localization performance of targets in the sensory congruent target-distractor pair (dot with faces or beep with sounds) was affected by the emotion of the distractor. In auditory pairs (target: beep; distractor: sounds), the type of emotion affected performance, with the positive emotional distractors impairing localization performance most, and negative emotions, least. In visual pairs (target: dot; distractor: faces), arousal level of the emotions affected performance, with both the positive and negative emotional distractors impairing localization performance more, compared to neutral distractors.

In presentation of the distractor with the response screen, there were no such effects. However, neutral visual distraction (faces) impaired localization performance more than negative emotional auditory distractors (sounds). These results highlight the complexity of the multi-sensory emotional integration that occurs in spatial cognition.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The effect of dot-size variance on children's biases in numerical discrimination tasks

Presenter(s): Manish Toofany

Abstract

The intuitive number sense allows us to rapidly estimate the number of objects in a visual display. In behavioral experiments, objects' non-numerical visual attributes, namely their individual sizes and spacing, influence numerosity judgements. Adults overestimate the number of small, sparsely distributed dots, while underestimating the number of large, densely distributed dots. While previous studies in adults have shown that these biases arise at the level of response formation but do not play a central role in the early visual system's number estimation mechanism, questions remain regarding how these cues influence children's number sense. This study explored whether non-numerical cues, namely size and spacing lead to similarly biased number-comparison judgments in children. On each trial, children aged 4-12 had to decide which of two arrays contained more dots. We systematically varied dot size and spacing. The results showed that children of ages 9 to 12 exhibited the same bias as adults. However, those aged 5 to 7 exhibited the opposite bias- they tended to underestimate the number of small, sparsely distributed dots, while overestimating the number of large, densely packed ones. Eight-year-old children were seemingly in a transition between the biases exhibited by younger and older children. These results suggest a fundamental transition in the way non-numerical cues influence children's number judgments across development, but it is unclear whether this reflects a change in how children visually encode number or how different quantitative dimensions influence their responses. Further studies could look at these findings in the context interventions for developmental dyscalculia.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Impact of the Emotionality and Vividness of a Crime on Eyewitness Memory

Presenter(s): Alyssa Lorenz, Tianqi Peng, Queenie Zhang

Abstract

The proposed study explores the impact of emotion and vividness on eyewitness memory. Eyewitness memory is a critical component of trial proceedings and has the potential to significantly impact determinations of guilt and sentencing decisions (Clifford & Hollin, 1981). Past research has suggested that negative emotions associated with violent and gruesome crimes leads to more accurate memories (Laney et al., 2004). Our proposed study follows a 2x2 design with gruesomeness (high vividness vs. low vividness) and emotion (high vs. low). Participants will be asked to complete the Trait Emotional Intelligence Questionnaire-Short Form (Cooper & Petrides, 2010). Additionally, the Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1999) will be administered to assess state affect pre- and post-watching one of four short videos of a violent crime. A follow-up survey will be administered one-week later to assess each participant's degree of accuracy in remembering components of the crime video. It is hypothesized that participants will receive significantly higher scores on the PANAS-X after watching the high emotion and high vividness crime video compared to those participants who watch crime videos that elicit high emotion and low vividness or low emotion and high vividness. Moreover, it is hypothesised that participants will be able to better recall information from the highly emotional and vivid crime videos. Further, it is predicted that participants with higher trait emotional intelligence will have more accurate memory recall upon follow-up.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1008 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Sustaining Project Bhangra: A Bhangra dance intervention for South Asian children

Presenter(s): Simran Gill, Inderpreet Basra, Pravnit Kooner

Abstract

South Asians are the largest visible minority group in Canada, expecting to triple in size by 2031. In this group, rates of obesity-related diseases including cardiovascular disease and diabetes are twice as high compared to other ethnic groups. Project Bhangra was a culturally innovative after-school fitness program designed for elementary students across Surrey and Delta. This project aimed to reduce the risk of diabetes for South Asian children, by promoting an active and healthy lifestyle through Bhangra dance. Project Bhangra's pilot project launched in September 2017 and involved weekly after-school Bhangra classes targeting approximately 172 students across 4 elementary schools: Newton, Beaver Creek, Jarvis Traditional and Coyote Creek Elementary. According to preliminary analysis of the data collected, there were significant improvements in morphological waist circumference, musculoskeletal fitness, and cardiorespiratory fitness. These findings are encouraging, yet according to Cooper et. al (2015) unless such programs are able to sustain themselves, they are unlikely to have a broad public health impact. In September 2018 the research team withdrew from the program, allowing schools the option to continue if they choose. Our study investigates whether Project Bhangra can be sustained without the support of the research team. We will ensure that all the schools will be provided with the necessary resources to continue the program, but it will ultimately be the schools' responsibility to orchestrate the continuation of Project Bhangra. As the school year advances, we will be examining what factors contributed/impeded the implementation of Project Bhangra.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: The Peptidisc: a method for stabilizing membrane proteins

Presenter(s): Jeff Chen

Abstract

Over 50% of today's drugs are targeted towards membrane proteins, indicating the significance of membrane proteins in cell function and disease. Membrane proteins (proteins which are embedded in the cell's lipid membrane) are particularly important in cell signalling and transport. However, these proteins are notoriously difficult to study due to their instability when extracted from the membrane. Therefore, chemical tools (termed "membrane mimetics") have been developed to stabilize membrane proteins taken out of their native environment. Recently, the Peptidisc has emerged as a novel membrane mimetic, which has the unique ability of capturing and stabilizing membrane proteins of any size. Testing the "one size fits all" approach, we wanted to probe the ability of the Peptidisc to capture a wide range of different membrane proteins. In this study, we developed a methodology to extract all the proteins from a eukaryotic membrane, stabilize them in the Peptidisc, and identify all the proteins captured in the Peptidisc. We determined that the proteins captured in the Peptidisc accurately reflect the composition of proteins in the original membrane. Therefore, our study demonstrates that the Peptidisc is capable of encapsulating and stabilizing a wide variety of membrane proteins in the cell. By facilitating the handling of membrane proteins, and making them compatible with traditional protein characterization techniques, the Peptidisc has the potential to accelerate the research of membrane proteins.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Neuropsychological Performance as a Predictor of Treatment Response

Presenter(s): Ananya Sandhu

Abstract

Major depressive episodes (MDEs) occur within the context of Major Depressive Disorder (MDD) and Bipolar II Disorder (BDII), creating difficulty in distinguishing between the two. Additionally, MDEs are difficult to treat, with only 30-45% of patients responding to initial treatment. Currently, treatment response can only be assessed after several weeks, prolonging the time required to identify an effective treatment for a patient. Studies comparing BD to MDD suggest that bipolar patients show hypersensitivity to reward and positive stimuli. Early changes in such emotional processing measures have also been correlated with treatment response in MDD. This study will analyze whether baseline differences in emotional processing between MDD and BDII can be detected in an MDE, and if early changes in emotional processing can predict treatment response.

Depressed participants with MDD or BDII will be prescribed a 10-12 week course of treatment with antidepressants or mood-stabilizing medications. Prior to treatment, participants will be administered a standard battery of emotional processing tasks and will complete two different symptom rating scales. These will be re-administered early in the course of treatment (i.e. at 2 weeks) and after completing treatment. Based on the literature, we predict that depressed BDII patients will show higher sensitivity to reward and positive stimuli compared to depressed MDD patients at baseline. We also hypothesize that early attenuation of reward hypersensitivity would predict successful treatment in BDII, whereas the opposite would predict response in MDD. Project findings could aid in the development of clinical diagnostic and predictive tests for treating depression.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Transfer of Cognitive to Academic Outcomes of the Arrowsmith Program

Presenter(s): Larissa Chiu

Abstract

There is a growing interest in cognitive intervention programs as a means to improve the cognitive and academic abilities of children with learning difficulties. Many of these programs infuse the principles of neuroplasticity into their efforts to strengthen neural connections and fundamentally enhance the brain's capacity to learn. One of these programs, the Arrowsmith Program, has not been empirically examined to date. The purpose of this study is to identify evidence of potential transfer of cognitive improvements to academic skills in participants in the Arrowsmith Program, after approximately one year in the program. A group of 28 participants, ages 9 to 17, completed the Woodcock Johnson Tests of Cognitive Abilities-Third Edition (WJ-III COG) and the Tests of Achievement, Third Edition (WJ-III ACH) at two time points (baseline and after one year in the program) to assess change in their cognitive and academic ability over a period of one year. Previously presented data suggest significant growth in many cognitive and academic areas within this sample. Regarding potential evidence of transfer, bivariate correlational analyses indicate significant, positive relationships between growth in some of the cognitive and academic domains. Specifically, reading comprehension improvement was significantly correlated with growth in auditory working memory, math fluency improvement was associated with improvement in auditory processing and vigilance, and math problem solving improvement was associated with cognitive growth in inductive reasoning. These results allow us to begin to understand the long-lasting effects of interventions and programs for children with learning disabilities in their academic pursuits.

WAVE 4 | ORAL PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

PCOH 1215 || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Dopaminergic Neuron Degeneration and Resultant Behavioral Defects Caused by Mutations in Homologs of PD-Associated Genes in *C.elegans*

Presenter(s): Desta Rabin

Abstract

Parkinson's disease (PD) is a progressive neurodegenerative disorder which affects roughly 10 million people globally. PD is characterized by a loss of neurons (brain cells) and resultant defects in behavior, speech, smell, and motor function. PD can occur with or without a familial connection although both can have genetic components. To date 18 genes have been linked to PD. *C. elegans* have homologs of some of these genes and data suggest that mutations in these genes can result in PD-like phenotypes in the model organism, including neurodegeneration and behavioral defects. This project studies the effects of mutations in several different PD-associated genes on the morphology of dopaminergic neurons and alterations in behavior in *C.elegans*. *C. elegans* is an ideal model organism for studying these genes because the complete nematode genome and all neural connections have been mapped. Additionally, we can observe changes of specific neurons after genetic manipulation in live organisms. In this project we evaluate the health of neurons in different PD mutants by expressing a fluorescent protein in them and studying their morphology. We also use optogenetics to stimulate specific neural pathways with blue light in PD mutant strains to identify any alterations in behavior that could be caused by the mutations. Through these experiments we are gaining a better understanding of the functional changes in neurons caused by each mutation. The results of this study could provide insight into the biological mechanisms responsible for PD.

WAVE 4 | POSTER PRESENTATIONS

LIST | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

THEME: HEALTH AND WELLNESS

A Study on Morphometric Features of Trachea, Larynx and Esophagus	Azi Ebrahimi-Asky Golsan Zilabi
The Design of Lipid Nanoparticles formed from Rapid Mixing for the Transport and Delivery of Drug Therapy	Larissa Rogowsky
Introduction of an ex-vivo pig model for teaching percutaneous nephrolithotomy access techniques	Jonathan Lim
The effects of SLO-1 on C.elegans habituation under the influence of alcohol	Joani Viliunas
Comparison of accelerometer measured physical activity in Weekday vs Weekend levels for South Asian Children in Canada	Matthew Fischer
Diagnostic performance and efficiency of magnetic resonance imaging (MRI) in suspected acute appendicitis	David Jung
MiRNAs in extracellular vesicles from oral squamous cell carcinoma (OSCC) cells potentially contributing to erlotinib resistance	Hanna D'Cruz Maria Beletsky Christina Gentle Jeong Min Son
Aberrant mRNA Splicing by Mutant sf3b1 Protein Activity and Possible Links to Uveal Melanoma Metastasis: A Transcriptome Analysis	James Lo Xinyin Wang Elaine Chen
Alterations of Endothelial Cell Junctions of the Blood Brain Barrier in a Model of Stroke	Hirad Nourbakhsh

Effect of EIF1AX Mutation on mRNA Translation in Uveal Melanoma	Cecilia Lee Sabrina Gulam Phillip Qiao
The Effect of Genes and Cellular Pathways on the Disappearance of Melanocytes with Mutated GNAQ Oncogene	Saba Modonhaghighi Megan Pan
Development of a flow chamber for simulating gastrointestinal digestion of food micro-particles	Diane Nguyen
Influence of genetic variants associated with triglyceride levels on sepsis survival	Mairead Cavinaw Sarah Ng Arshdeep Khurana Japnit Bhatia
Testing PEC-Direct and PEC-Encap devices as a treatment of type 1 diabetes using a non-human primate preclinical model	Christopher Mulya Sharon Zhu Nyra Ahmed Maggie Yang
Treating Female Genital Tuberculosis and Increasing Fertility Amongst Diagnosed Mothers	Rameen Siddiqui Jennifer Mitchell
Enrichment of O-GlcNAcylated peptides using hydrophilic interaction chromatography and deglycosylation	Kasra Kamal
Antimicrobial Activity of thyme (<i>Thymus vulgaris</i>) extract on Feline Calicivirus, surrogate of Human Norovirus	Egon Shin Thomas Chan
The Genetic Basis of the Role of Sonic hedgehog Signalling on Cerebellar Development	Georgia Yee Meg Wang Donna Hong
Hyperinsulinemia-associated changes to cardiac proteome	Lorenzo Lindo

THEME: INDIVIDUAL AND SOCIETY

Health factors that influence calf auction prices	Lillian Lu
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Impacts of Total Knee Replacements due to Osteoarthritis on Family Caregivers	Emma Le Sneha Gupta Laura Meleady Shruti Swami
Differences in Type 2 Diabetes Prevalence Across Income Groups: Results from the Canadian Community Health Survey (2013/2014).	Eashan Halbe Hannah Doyle Kiran Jagpal
Understanding Traditional Coast Salish Textile-Dyeing Practices: The Identification of Mordants on Salish Weavings using pXRF	Tessa Grogan
iCON: The impact of interdisciplinary, culturally relevant health education on improving health outcomes in South Asian and Chinese minority participants	Harleen Chohan Tina Cheng
Universal, and Culturally-Specific Emotional Cues in Traditional Chinese Music: A Listening Response Study	Cherise Kwok
What is the nature of global health in undergraduate education in Canada?	Aishwarya More
Sugar Consumption and Tooth-brushing Behaviour in Canadian Adolescents	Gary Yen

THEME: INNOVATION AND TECHNOLOGY

Effect of light wavelength on chloroplast length in wildtype <i>Euglena gracilis</i>	Rishi Gupta Deep Dhot
Human expert versus computer: How do they compare when screening abstracts for a knowledge synthesis project?	Jasmine Shi
Solving the Light Scattering Limitation of Optogenetics	Parsa Seyfourian Wendy Yang Tricia Villegas Jean Zheng
Synthesis and characterization of novel bifunctional chelators for therapeutic and diagnostic application	Valeria Narykina Nicole Sarden

Training of deep convolutional neural nets to recognize radiomic signatures of tumors	Jiwon Kim Sophia Seo
VARBIS: Virtual Acoustics: Real-time Binaural Simulation	Anders Grasdal
Using a Digital Multimedia Platform to Teach Anatomical Sciences	Kamal Moghrabi
Differentiating metabolites in R.macaques using a Multi-omic Approach	Kimia Nozadi

THEME: SUSTAINABILITY AND CONSERVATION

Investigation of How Temperature Impacts the Growth Rate of Tetrahymena thermophila	Jocelyn Cheng Sung Ju Lee
Exploring Groundwater Options for the City of Vancouver	Beste Pazarozuyurt
Determining the efficacy of motion activated sprinkler deterrents to improve human-coyote coexistence in Vancouver, British Columbia	Brynn McLellan
Moss Under Pressure: How Wide Are Your Hyaline Cells?	Louisa Tambunting Nicole Jung
Location Confirmation of Sockeye, Chum and Pink Salmon Species on the Coast of British Columbia	Simryn Atwal
An Exploration on the Productive Methods of Microalgae Biofuels Production	Ophela Zhang Bhavi Polavarapu Alina Chalanuchpong
Effect of Temperature on the Rate of Vacuole Formation in Tetrahymena thermophila	Hannah Xiao
Climate Change in the High Alpine Zone: Responses of Central Karakoram-Himalaya Flora	Kelly Hurley
Investigating ploidy of Fraser River white sturgeon (Acipenser transmontanus) cultured at Vancouver Island University	Csilla Vasarhelyi

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: A Study on Morphometric Features of Trachea, Larynx and Esophagus

Presenter(s): Azi Ebrahimi-Asky, Golsan Zilabi

Abstract

The importance of this study comes in to light when we want to talk about dosimetry for treating cancer patients using radiotherapy. Every field of science benefits from accurate measurement either directly or indirectly. In the field of radiotherapy, dosimeters is measuring the dose of radioactive radiation which is crucial in treating the cancer patient. This measurement is required in order to calculate the effect or average doses in an area, although this is impossible without knowing the dimensions and the weight of the organ. It is interesting to mention that there's no literature specifying the exact morphometric measurement of trachea or larynx or esophagus.

The objective of this study is to determine the morphometric features of larynx, trachea and esophagus and discuss the possible correlations between the height and weight of larynx, trachea and esophagus with other parameters such as height, weight and age of patients. Different samples were measured using tape and digital scale. The results of measurements showed significant correlation between the age of individuals and the weight and length of trachea and larynx. However, no significant correlation was found between the length and weight of trachea or larynx with either gender, height or weight of individuals. The results of measurement showed significant correlation between the age and the weight of esophagus. However, no significant correlation was found between the length and weight of esophagus with either height, weight or gender; plus the positive correlation between the age and the weight of esophagus was seen in 60% of the population. The results of the study was somewhat surprising as we believed that weight and gender would also have a correlation with the parameters of trachea and larynx, but the fact that length is correlated is no surprised and was an expected result to our predictions.

Key words: trachea, larynx, esophagus, height, age, radiotherapy, dosimetry

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Design of Lipid Nanoparticles formed from Rapid Mixing for the Transport and Delivery of Drug Therapy

Presenter(s): Larissa Rogowsky

Abstract

Treatment of cancer and other autoimmune diseases requires the delivery and accumulation of drugs in specific bodily cells; current treatments are often ineffective in this regard. Lipid nanoparticles (LNPs) provide an effective delivery solution: they're a stable, protective vehicle that can encapsulate a variety of therapeutic agents, retain them within the bloodstream, and deliver them preferentially to tumours and sites of inflammation. The primary components of LNPs are cholesterol and phospholipids. One phospholipid, distearoyl-phosphatidylcholine (DSPC), has been extensively used as the main phospholipid component. LNPs that contain other phospholipids with differing carbon chain lengths and degrees of unsaturation have yet to be tested and are the focus of this study. Lipid formulations were created by rapid mixing (propulsion down a X-tube apparatus) of cholesterol and different phospholipids in ethanol and phosphate-buffered saline. Formulations were dialyzed, filtered, concentrated and analyzed for particle size. To assess uptake of these LNPs, three different cell lines were treated and analyzed by high-content analysis using the Cellomics. LNPs formulated with dimyristoyl-phosphatidylcholine (DMPC) and dipalmitoylphosphatidylcholine (DPPC) showed enhanced delivery to macrophage cells, suggesting that phospholipids with shorter hydrocarbon chain lengths are more effective. However, controlling for particles size was a limitation and could be another factor in enhanced cellular uptake. These results have added to the body of knowledge concerning the most efficacious nanoparticle design. DMPC seems to create particles with the greatest delivery efficiency, which could reduce dangerous side effects and improve treatment efficiency for cancer and autoimmune diseases.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Introduction of an ex-vivo pig model for teaching percutaneous nephrolithotomy access techniques

Presenter(s): Jonathan Lim

Abstract

Introduction: Percutaneous nephrolithotomy is a urologic procedure to remove kidney stones. In North America, the step of obtaining access during PCNL often requires radiologists, resulting in an unnecessary two-stage procedure. Hands-on training sessions help to ensure this skill continues within the urologic community. A new ex vivo pig model with a fluoroscopic C-arm and standard PCNL equipment was developed for this purpose. We propose this as a high-fidelity tool for teaching PCNL access.

Methods: The pig kidney, fat, ribs, flank, and skin were arranged anatomically on a table with fluoroscopy. Hands-on training was provided to residents and urologists using the ex-vivo pig model and a silicone model. Questionnaires were given at the end of the session.

Results: There were 14 responders total for each model. A total of 15% of responders for the pig model and 7% of responders for the silicone model had previous percutaneous access experience. For the pig model, 93% of trainees agreed or strongly agreed that the model was easy to use, and 79% of the silicone model trainees felt the same. After the session, 100% of pig model trainees and 65% of silicone model trainees reported that they had increased their understanding of the percutaneous access procedure. All the pig model trainees and 71% of the silicone model trainees felt that the simulation activity was worthwhile.

Conclusions: The inexpensive but anatomically realistic ex-vivo pig model using real world equipment provides trainees with an excellent tool to learn PCNL access.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The effects of SLO-1 on C.elegans habituation under the influence of alcohol

Presenter(s): Joani Viliunas

Abstract

Alcohol causes diverse dose-dependent effects on a broad range of animal behaviours, including learning and memory. Although behavioural effects of alcohol on animals have been extensively studied, the underlying biological mechanisms through which these effects occur are relatively unknown. The ability of ethanol to influence both mammalian as well as C. elegans tissues at similar concentrations suggests high genetic conservation and provides a powerful system to model mechanisms of alcohol's effects on behaviours such as habituation. Genetic screens for genes that regulate behavioural changes under ethanol identified slo-1, a gene that encodes big conductance (BK) potassium channels. In wild-type C. elegans, there is impaired non-associative learning in the presence of alcohol, while loss-of-function slo-1 mutants express ethanol tolerance, showing fewer habituation abnormalities under the same exposure. It is currently unclear where alcohol acts on SLO-1 to disrupt the neural circuits controlling non-associative learning. Traditional methods to cell-specific genetic manipulations in C. elegans rely on variable and mosaic overexpression while a recently developed method allows for precise tissue-specific loss-of-function experiments by tagging the endogenous genetic locus with GFP and then degrading GFP-tagged proteins within selected tissues using cell-specific degron proteins. Here, we used this strategy to degrade functional SLO-1::GFP in the nervous system and showed we could prevent the effect of alcohol on habituation, confirming its target is neuronal SLO-1. To further delineate in which specific neurons alcohol is acting on SLO-1, targeted degradation of the slo-1 gene product in touch receptor neurons and ciliated sensory neurons will also be performed.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Comparison of accelerometer measured physical activity in Weekday vs Weekend levels for South Asian Children in Canada

Presenter(s): Matthew Fischer

Abstract

In Canada, South Asian (SA) children have lower levels of moderate to vigorous physical activity (MVPA) compared to other ethnicities¹⁻³. This leads to greater onset risk of metabolic disease including cardiovascular disease for SA adults at a younger age⁴. Children's physical activity levels vary by time and frequency with differences in weekday versus weekend levels of MVPA being shown in previous studies⁵⁻⁹. However, predictors of physical activity (PA) change in weekdays compared to weekends and PA intensity are rarely investigated and has yet to be studied in Canada. The aim of this study was to objectively assess weekend versus weekday MVPA levels of SA children in Canada aged 7-11 years old using accelerometers. Correlations with MVPA investigated are Socioeconomic status, gender and age. Data was evaluated from 172 children who wore accelerometers for 7 days to measure physical activity. The accelerometer had to be worn 10 hours a day for a minimum of three total days with at least one weekend day to be eligible. There was no statistical difference between those with and without a weekend day recorded. Using a paired t-test higher levels of MVPA activity was seen on weekdays compared to weekends ($p < 0.0001$). There were significant differences between sex, BMI levels and total MVPA levels ($p < 0.0001$). The only group to meet the Canadian 24-hour movement guidelines of MVPA recommending 60 minutes/day were males on weekdays. Interventions targeted at weekends and females within cultural context common to each city are recommended.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Diagnostic performance and efficiency of magnetic resonance imaging (MRI) in suspected acute appendicitis

Presenter(s): David Jung

Abstract

OBJECTIVE: Assess diagnostic performance and timeliness of MRI for suspected acute appendicitis versus other modalities of ultrasound (US) and computed tomography (CT).

METHODS: Single institution, IRB-approved, retrospective study of adults with suspected acute appendicitis in emergency department between May 2017 and May 2018. Diagnostic performance was examined using a contingency table. Timeliness was analyzed by comparing average patient wait times among modalities, defined as between times of initial imaging and subsequent management.

RESULTS: 599 patients were examined, including 445 US (54.7%), 137 MRI (16.9%), and 231 CT scans (28.4%). Sensitivity, specificity and diagnostic yield of MRI were respectively 91.7% (95%CI, 73.0%-99.0%), 85.0% (95%CI, 77.0%-91.0%), and 88.3% (95%CI, 81.9%-92.7%), not significantly different from CT with respective values of 94.3% (95%CI, 84.3%-98.8%), 88.8% (95%CI, 83.2%-93.0%) and 93.1% (95%CI, 89.0%-95.7%). With intention-to-diagnose method, diagnostic performance of US was significantly lower than MRI and CT ($p < 0.01$), with sensitivity of 61.5% (95%CI, 51.5%-70.9%), specificity of 18.2% (95%CI, 14.2%-22.7%), and diagnostic yield of 29.7% (95%CI, 25.6%-34.1%). Mean wait times with MRI as initial modality ($n=21$, 3.5%, 100.6 minutes) was not significantly different from CT ($n=133$, 22.2%, 104.3 minutes, $p=0.78$) or US ($n=238$, 39.7%, 125.6 minutes, $p=0.29$). Imaging routes involving multiple modalities had significantly longer wait times than routes where patients experienced single modality ($p < 0.01$).

CONCLUSION: Diagnostic performance of MRI is superior than US, and comparable to gold standard of CT. With favourable wait times, MRI may have the clinical utility as initial investigation modality for suspected acute appendicitis.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: MiRNAs in extracellular vesicles from oral squamous cell carcinoma (OSCC) cells potentially contributing to erlotinib resistance

Presenter(s): Hanna D'Cruz, Maria Beletsky, Christina Gentle, Jeong Min Son

Abstract

Oral squamous cell carcinoma (OSCC) is the most common oral cancer and most common subtype of head and neck cancer, with a patient 5-year survival rate of approximately 50%. OSCC cells that overexpress the Sphingomyelin Phosphodiesterase 3 (SMPD3) gene have been found to resist chemotherapy. An important aspect of cancer growth is cell-to-cell signalling, which is accomplished by packaging of information within extracellular vesicles (EVs). MicroRNAs (miRNAs) are packaged within EVs to communicate information between cells. This study aimed to uncover which miRNAs display an increase or decrease in expression between SMPD3 overexpressing OSCC cells and EVs, relative to control OSCC cells and EVs. Extracellular vesicles were isolated through ultracentrifugation, followed by analysis of miRNA expression in cells and extracellular vesicles using TaqMan Low-Density Array cards, which are able to detect miRNAs in a sample and profile their expression. Ultimately, nine miRNAs out of over 400 were identified to exhibit at least a four-fold change in expression. One miRNA that showed a significant increase in EVs released by the SMPD3 overexpressing OSCC cells was MiR-636. Interestingly, MiR-636 has been linked to Transforming Growth Factor Beta signalling, which is a known mechanism of chemotherapy resistance in squamous cell carcinoma. This study helps explain how SMPD3 overexpression in cancer cells changes the miRNA content of extracellular vesicles and their cells of origin. Further exploration of the role of these miRNAs could facilitate the development of gene targeting drugs in order to treat OSCC more effectively.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom | | Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Aberrant mRNA Splicing by Mutant sf3b1 Protein Activity and Possible Links to Uveal Melanoma Metastasis: A Transcriptome Analysis

Presenter(s): James Lo, Xinyin Wang, Elaine Chen

Abstract

SF3B1 mutation is found in approximately 20% of Uveal Melanoma (UM), an aggressive ocular cancer with a higher metastasis rate than cancers from other vital organs in the human body. A recurrent hotspot mutation at amino acid residue 625 has been identified to cause aberrant splicing during pre-mRNA processing, which ultimately results in downregulation of wild type protein production. The goal of this study is to identify key target genes in cancer-related pathways that are affected by SF3B1 to unveil the mechanism in which SF3B1 mutation drives metastasis in UM. Any possible discrepancies between mutant and wildtype on both RNA and protein levels will be examined. Site-directed mutagenesis will be performed at codon 625, and transcriptome sequencing will then be performed to detect alternative gene expression in cells expressing mutant SF3B1 proteins. Finally, amino acid sequences in all cellular proteins will be analyzed by mass spectrometry to identify abnormal excisions and incisions. SF3B1 mutant cells are expected to display lowered wild type transcript and protein levels, in addition to expression of aberrant transcripts and proteins, in several genes previously known to be affected by mutant sf3b1 activity. Data generated in this study serves as a valuable starting point for developing both novel and specific UM treatments targeting SF3B1 hotspot mutants. Additionally, the normal function of genes affected by mutant sf3b1 activity could be further examined to understand their precise roles in carcinogenesis.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Alterations of Endothelial Cell Junctions of the Blood Brain Barrier in a Model of Stroke

Presenter(s): Hirad Nourbakhsh

Abstract

One of the key pathological manifestations of stroke is the breakdown of the blood brain barrier (BBB). Tight junction complexes in vascular endothelial cells of the BBB are crucial to the integrity of this barrier, and the regulation of transport of molecules across it. It has previously been demonstrated that tight junction complexes in mammals are degraded by host proteinases during stroke. Furthermore, cerebral ischemia has been associated with changes in the expression levels of the tight junction proteins zonula occludens-1 (ZO-1), occludin, and claudin, as well as altered localization of claudin due to disruptions in protein trafficking. Expression of the water channel aquaporin-4 (AQP4), present in astrocytic endfeet, has been shown to be increased in the brain of animals that have been induced to have brain edema. It has been hypothesized that AQP4 is involved in eliminating accumulated fluid from the brain during stroke. I am seeking to determine whether the localization of tight junction markers between endothelial cells, and AQP4 in astrocytic endfeet, of the BBB are altered in rats subjected to transient middle cerebral artery occlusion (MCAO), and if so, how. I will label ZO-1, claudin, and occludin, as well as AQP4 and beta-dystroglycan (a transmembrane protein localized at astrocytic endfeet) using immunofluorescence. I will perform the analysis using confocal microscopy. I expect that the localization of tight junction markers and astrocytic endfeet proteins will be altered in the BBB of the MCAO rat brains, as compared to control rats.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Effect of EIF1AX Mutation on mRNA Translation in Uveal Melanoma

Presenter(s): Cecilia Lee, Sabrina Gulam, Phillip Qiao

Abstract

Uveal melanoma (UM) is a cancer in the pigment-producing cells of the eye. While treatment of the primary intraocular tumour has a success rate of 90%, metastasis of this cancer is prevalent in up to 50% of patients, and shows low responsivity to systemic chemotherapy. It is estimated that 14-20% of all UM contains a mutation in eukaryotic translation initiation factor 1-A, X-chromosomal (EIF1AX) gene, which plays an important role in mRNA translation within the cell. Recent studies have observed EIF1AX mutations to affect the N-terminus tail (NTT) of the resulting polypeptide, a site that is critical to mRNA binding. While these findings implicate that EIF1AX drives UM through aberrant translation regulation, there is currently no research investigating the mechanism of this process in human UM cells. In this project, an experimental design is proposed to determine discrepancies in translational regulation between normal and mutant EIF1AX genes using quantitative polysome profiling analysis. Furthermore, RNA sequencing will be used to assess potential similarities between the structure and/or function of these targeted genes. Research generated from this project will lead to new insights on the molecular pathways driving UM tumorigenesis, which will be critical for the development of more effective clinical therapies.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Effect of Genes and Cellular Pathways on the Disappearance of Melanocytes with Mutated GNAQ Oncogene

Presenter(s): Saba Modonhaghighi, Megan Pan

Abstract

Melanocyte cells, derived from neural crest cells, are present in the epidermis and hair follicles and produce melanin, which determines skin, hair, and eye color. An oncogene is a gene which can cause a cell to become cancerous under certain circumstances. When certain oncogenes, such as GNAQ, are mutated in melanocytes, they can cause the cell to proliferate continuously and cause cancer.

In our study, we focused on genes from RNA sequencing of melanocytes of the tail epidermis in a mouse model. In the lab, these melanocyte cells were mutated to express the GNAQ oncogene, however instead of proliferating continuously, the cells that expressed the GNAQ oncogene began to disappear. The goal of our study is to investigate genes, pathways, and biological processes related to the disappearance of melanocytes that express GNAQ oncogene. This information can be used to determine how epidermal melanocytes resist the oncogenic effects of GNAQ and be used to study the genes potentially involved in the disappearance of GNAQ expressing melanocytes.

We separated genes from RNA sequencing into up and down regulated based on their z-score. We used the David Bioinformatics Resources website and chose 5 significant KEGG pathways and biological processes for the up and down regulated genes based on their Benjamini value that were related to cancer, cell division, and cell death.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Development of a flow chamber for simulating gastrointestinal digestion of food micro-particles

Presenter(s): Diane Nguyen

Abstract

New innovations are emerging in the food industry as consumers are becoming more aware of the relationship between food, nutrition, and health. Diet is widely acknowledged as a key factor attributing to the increase in obesity, type II diabetes, and other metabolic disorders in recent years. Understanding the digestive behaviour of starch-containing food matrices has been of current interest, as starch has been recognized for its potential role in controlling weight and postprandial blood glucose levels. This has major implications for the risk reduction of various chronic non-communicable diseases. Simulated gastrointestinal digestion is a widely employed method used to study the structural changes and digestibility of foods because it offers reproducible results at a low cost, in comparison to animal and human studies. Most studies on in vitro digestion are performed on large samples of material that provide good statistical metrics of digestion but are limited in providing a mechanistic understanding. For this reason, the aim of this project is to develop a microscopic digestion system allowing for the visual observation of in situ digestion of individual food particles. This new in-vitro digestion model will be used to investigate the rate of digestion of un-encapsulated starch and individual starch cells of different types of beans. This will enhance the understanding of the relationship between food structure and digestion and how it can be just as important as knowing the composition of the food itself, which can enable the design of healthy food products in the future.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Influence of genetic variants associated with triglyceride levels on sepsis survival

Presenter(s): Mairead Cavinaw, Sarah Ng, Arshdeep Khurana, Japnit Bhatia

Abstract

Introduction:

Sepsis is a life-threatening response to a severe infection and is associated with major alterations in the metabolism of lipids in the blood (e.g. lipoproteins, triglycerides, cholesterol). Higher levels of cholesterol-rich lipoproteins in the blood appear to improve a patient's chance of surviving sepsis due to increased removal of microbial toxins. However, there is no consensus on how blood triglyceride levels influence patient survival of sepsis. This may be because triglyceride levels can be confounded by environmental factors or comorbidities. Therefore, the aim of this study is to investigate how genetic variants that associate with triglyceride levels influence sepsis survival (genetics are often free of confounding).

Hypothesis:

Since triglyceride-rich lipoproteins could remove microbial toxins from the blood similar to cholesterol-rich lipoproteins, we hypothesize that genetic variants associated with higher levels of triglycerides will correlate with increased survival from sepsis.

Methods:

24 genetic variants that were significantly associated with triglyceride levels in the Global Lipids Genetics Consortium's genome-wide association study will be included in our analyses. We will compare how these genetic variants influence the 28-day and 90-day survival of 3684 septic patients from the UK Biobank cohort using Cox-proportional hazards ratios. We will adjust our results for possible confounding variables such as age, sex, genotyping batch, and genetic ancestry.

Importance:

Sepsis mortality remains high due to the lack of specific treatment(s). This study's results may improve the ability to predict patient survival from sepsis and identify blood triglyceride levels as a possible therapeutic target.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Testing PEC-Direct and PEC-Encap devices as a treatment of type 1 diabetes using a non-human primate preclinical model

Presenter(s): Christopher Mulya, Sharon Zhu, Nyra Ahmed, Maggie Yang

Abstract

Type 1 diabetes is an autoimmune disease that is characterized by the loss of insulin-producing pancreatic beta-cells leading to glycemic lability. Current treatments, such as islet cell replacement, have seen relative success but are limited by the need for immunosuppression. We will test the effectiveness of PEC-Direct™ and PEC-Encap™ devices in non-human primates, rhesus macaques (*Macaca mulatta*). We hypothesize that PEC-Encap™ is a better option for patients. Encapsulated devices are able to protect the PEC-01™ cells and therefore can be used in immunocompetent patients, unlike PEC-Direct™ which allows direct vascularization to the PEC-01™ cells. We will be loading PEC-01™ cells in the two types of devices for implantation. Two PEC-Direct™ devices will be surgically implanted under the skin of 10 rhesus macaques monkeys during an outpatient procedure. These 10 monkeys will be given immunosuppressants. The PEC-Encap™ devices are also surgically implanted under the skin of 10 different immunocompetent rhesus macaques monkeys. Post-implantation evaluation will be done by measuring blood glucose level and human C-peptide serum in each experimental group. Blood glucose level will be measured using a portable glucometer whereas human C-peptide serum will be measured using GSIS assay method. GSIS analysis is expected to reveal an increase in C-peptide levels after oral administration as well as a decrease in fluctuating blood glucose. This would indicate ongoing insulin synthesis in the body as a result of PEC-01™ cells maturation, demonstrating successful integration and operation of the product in treating T1D symptoms in the subject.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Treating Female Genital Tuberculosis and Increasing Fertility Amongst Diagnosed Mothers

Presenter(s): Rameen Siddiqui, Jennifer Mitchell

Abstract

Background: Female genital tuberculosis (FGTB) is one of the leading causes of female infertility across the globe, yet is often late in its diagnosis due to the absence of significant symptoms indicating its presence.

Methods: A hysteroscopy or a laparoscopy may be performed as a diagnostic procedure to detect tubercles in various pelvic organs. After diagnosis, patients may be subject to the antituberculous therapy (ATT), short-course chemotherapy, or the administration of the drugs rifampicin, isoniazid, pyrazinamide, and ethambutol (RHZE) as a part of their treatment. To increase fertility, diagnosed mothers may test out in vitro fertilization (IVF).

Proposed Design: Retrospective analysis will be conducted on a sample of women who have undergone different treatments for FGTB. We will see whether the drug treatments have had significant effects on their condition and whether they were able to conceive following each treatment.

Anticipated results: We predict that treatment involving RHZE administration will be an effective method in controlling the consequences of FGTB. For mothers to conceive, in vitro fertilization (IVF) has shown promising results in aiding pregnancy after diagnosis. However, surrogacy or adoption is needed for women whose endometrium has suffered damage.

Conclusion: Therefore, the current model for treating FGTB involves the RHZE treatment, followed by close monitoring of the patient's state during treatment and the possibility of IVF if the woman wishes to conceive.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Enrichment of O-GlcNAcylated peptides using hydrophilic interaction chromatography and deglycosylation

Presenter(s): Kasra Kamal

Abstract

Post-translational protein modifications have been implicated in many human diseases, including neurodegeneration, cancer, and diabetes. Protein glycosylation is a common and essential type of post-translational protein modification present in cells. Many proteins found in the cell nucleus, cytosol, and mitochondria have been found to be glycosylated by a single monosaccharide known as O-linked β -N-acetylglucosamine (O-GlcNAc). O-GlcNAc is involved in many cellular processes, including protein folding and transcriptional regulation, yet its contribution to human diseases remains poorly understood. Proteome wide analysis of glycoproteins is therefore critical for understanding the functions of O-GlcNAcylated proteins, and for identifying potential disease biomarkers. However, due to the low abundance and difficulty in isolation of O-GlcNAcylated proteins, proteomic analysis of these protein modifications has proven challenging. We aimed to optimize robust sample preparation protocols for proteome-wide identification of O-GlcNAc proteins through enzymatic deglycosylation, hydrophilic interaction liquid chromatography (HILIC) enrichment, and mass spectrometry analysis. We pursued and optimized two separate sample preparation protocols, a micro-filter aided approach and a paramagnetic-beads based approach. Using human cell line lysates, we identified approximately 50 peptides, corresponding to approximately 50 O-GlcNAc proteins. Although promising, more specific methods of O-GlcNAc extraction are still needed for a wider identification of O-GlcNAcylated proteins. Once the sample preparation protocol is optimized, the next step will be to compare the protein modifications between healthy and diseased individuals in order to identify potential disease biomarkers.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Antimicrobial Activity of thyme (*Thymus vulgaris*) extract on Feline Calicivirus, surrogate of Human Norovirus

Presenter(s): Egon Shin, Thomas Chan

Abstract

Human Norovirus is a major contributor to gastroenteritis (vomiting and diarrhea) globally; in Canada, it causes 300-400 foodborne outbreaks annually. Currently, there is no available vaccine for human norovirus; however, decontaminating non-processed foods such as raw fruits, vegetables, and seafood can reduce the spread of infection by consumption. Previous studies show thyme to have antimicrobial properties, however few have tested its capabilities on noroviruses. In this study Thyme (*Thymus vulgaris*) essential oil(EO) will be tested for antiviral activity against a human norovirus surrogate, Feline Calicivirus (FCV), as norovirus is difficult to culture in tissue cells. The assay used will be 50% Tissue Culture Infective Dose (TCID₅₀) and will be executed with various concentrations of Thyme extract below the expected maximum nontoxic concentration(<2.0%). The viruses are to be treated with water and EO solutions in a pre-treatment, co-treatment and, post-treatment. Transmission electron microscopy, TEM, will be used to analyze the predicted structural integrity of the capsid of FCV to determine if RNA is exposed rendering it non-infective. It is expected that the titer of surviving FCV will decrease to 7.03 log TCID₅₀/0.1 ml for the pre-treatment. Co-treatment is anticipated to show a dramatic decrease of the titer. Post-treatment is also predicted to show significant FCV infectivity reduction to 2.56 log TCID₅₀/0.1 ml. The anticipated results are that Thyme extract will potentially have antiviral activity against FCV. This could lead to decontamination of human norovirus and shows promise to prevent many infections.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: The Genetic Basis of the Role of Sonic hedgehog Signalling on Cerebellar Development

Presenter(s): Georgia Yee, Meg Wang, Donna Hong

Abstract

The cerebellum is responsible for several vital functions including balance maintenance, movement coordination, posture, and motor learning. However, in order for these functions to be carried out proper development of the cerebellum is critical. The Sonic hedgehog (SHH) pathway plays a prominent role in granule cell proliferation, which is a cerebellar cell subtype, and it is currently being investigated for its role in malignant brain tumors. This morphogenic factor acts on gene expression through first binding to transmembrane protein PTCH, in turn activating the SMO receptor. SUFU is phosphorylated and GLIs are released, activating gene transcription. SHH expression shows no signs of decay after initial development, and consequently, this process must be strictly regulated throughout all life stages. Abnormal SHH signaling could result in a variety of motor-cognitive disorders or abnormal cell proliferation, eventually leading to cancer. We aim to discover candidate genes downstream of SHH signaling through mutation of the PTCH receptor protein. We hypothesize that the knockout of the Ptch1 gene will increase the proliferation of granule cells in the absence of the PTCH receptor due to the aberrant gene expression. The deletion of Ptch1 will allow us to observe changes in gene expression, which will help to identify candidate genes that could be mutated in a disease where the SHH pathway is dysfunctional such as medulloblastoma. All in all, our study aims to inform disease pathogenesis and identify possible routes for therapy.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Health factors that influence calf auction prices

Presenter(s): Lillian Lu

Abstract

In the beef industry, calves are sold at auctions for a wide range of prices, which becomes problematic for calf producers to obtain a consistent and predictable revenue. Understanding the important factors that influence calf sale price would allow farmers to make informed decisions about the best time to transport and sell their calves. Research to this date has not assessed the influences of health score on the auction price of dairy cattle. The objective of this study is to determine if there is an association between calf health parameters auction price. Randomly selected calves (n=359) were medically examined which included collecting navel and attitude scores as well as the heart girth measurement. Heart girth is the measurement around a calf's chest cavity to determine the size of the calf. A previously validated calf health score sheet from the University of Wisconsin was used to assess the parameters and the auction prices were also recorded. We hypothesize that calf prices will decrease as attitude and navel score increase alongside a decrease in heart girth. If actual results match our expected result, then we can make a positive correlation between the attitude and navel scores of calves and auction price. In addition, we can make a negative correlation between heart girth and auction price. The implications of this study can allow farmers to only transport the calves that will profit the farmer based on the health score and heart girth of calves.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Health and Wellness

Title: Hyperinsulinemia-associated changes to the cardiac proteome

Presenter(s): Lorenzo Lindo

Abstract

Insulin is an important modulator of lipid and glucose metabolism in the body and dysregulation of the level of circulating insulin can lead to various diseases. In particular, hyperinsulinemia, a condition in which there are excess levels of circulating insulin, has been found to play a major role in the development of obesity and diabetes. While the adverse effects of these diseases on the cardiovascular system is well-documented, the changes to the cardiac proteome as a result of hyperinsulinemia have yet to be studied in detail. To elucidate these alterations, we will first conduct a comparative proteomic analysis of cardiomyocytes from mice incapable of hyperinsulinemia (Ins1+/-; Ins2-/-) compared with littermate controls (Ins1+/+; Ins2-/-). Secondly, we will perform co-immunoprecipitation for key cardiomyocyte protein complexes followed by mass spectroscopy to identify any changes to cardiac protein complexes in mice with hyperinsulinemia. The results of our study would expand our understanding of the effects of hyperinsulinemia on the heart and may potentially guide future therapeutic strategies to reduce cardiac dysfunction in people suffering from and at risk of developing obesity and diabetes.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Impacts of Total Knee Replacements due to Osteoarthritis on Family Caregivers

Presenter(s): Emma Le, Sneha Gupta, Laura Meleady, Shruti Swami

Abstract

Osteoarthritis (OA) is a degenerative condition caused by the wearing down of cartilage surrounding the joints. This often results in a reduced quality of life, immobility, and chronic pain. Considering that 1 in 6 Canadians is affected by OA, research into its impacts on patients and their family caregivers (a friend or family member who provide the most unpaid care) is warranted. Our research aims to identify the impacts of providing care for an individual undergoing total knee replacement due to OA on their family caregivers. This qualitative study consists of semi-structured interviews of family caregivers of patients who have undergone total knee replacement. We will recruit 15 family caregivers to participate in a 45-minute interview. The family caregivers will be asked questions regarding the impacts of their family member's total knee replacement including physical and emotional well-being, career, and social life. Discussions will be audiotaped and transcribed verbatim for thematic analysis. The study will contribute to building a better understanding of OA impacts on family caregivers. The application of our results can provide useful knowledge to healthcare personnel such as potential impact so that they can support both patients and family caregivers prior to, during and post-treatment. Areas of future research should include the efficacy of resources developed to support family caregivers. In addition, the findings can help us to make recommendations for the development of educational resources for family caregivers which include strategies for dealing with the impacts of a family member's total knee replacement.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Differences in Type 2 Diabetes Prevalence Across Income Groups: Results from the Canadian Community Health Survey (2013/2014).

Presenter(s): Eashan Halbe, Hannah Doyle, Kiran Jagpal

Abstract

OBJECTIVE: The prevalence of Type 2 Diabetes (T2D) is increasing in Canada and the burden is expected to increase. Income, in addition to lifestyle factors, may play an important role. This project aimed to estimate up-to-date T2D prevalence across income strata.

METHODS: Data from the Canadian Community Health Survey (2013/2014) were used to estimate the prevalence of self-reported T2D by income quintiles for Canadian aged 18 to 74 years. Weighted proportions of T2D screening were calculated and logistic regression was used to assess the effect of income adjusting for confounders.

RESULTS: Self-reported T2D prevalence among Canadian was 5.6%. Of those that self-reported T2D, prevalence of T2D across income quintiles ranged from 3.5% (Quintile-5 High) to 7.2% (Quintile-2 Low). Lower income was associated with increased odds of T2D compared to the highest income quintile (Q1-Odds Ratio (OR) = 1.5, 95% CI 1.2-1.8). Lower education (Less-than-secondary OR = 1.4, 95% CI 1.3-1.7), increasing age (80+ Years OR = 77.4, 95% CI 47.2-127.0), and previous history of or current daily smoking (Daily smoking OR = 1.3, 95% CI 1.0-1.5) was associated with an increased odds of T2D.

Discussion: 5.6% of Canadians self-report T2D and low income was associated with higher rates of T2D. Socioeconomic and lifestyle factors were also associated with T2D. Efforts are needed to understand and address inequities, particularly among low-income Canadians.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Understanding Traditional Coast Salish Textile-Dyeing Practices: The Identification of Mordants on Salish Weavings using pXRF

Presenter(s): Tessa Grogan

Abstract

During the Fabric of Our Land exhibition at the Museum of Anthropology (MOA), members of the Salish weaving community expressed interest in knowing more about the dyeing process used while making the historic weavings featured in the exhibition. My research aims to address this request by studying historic Coast Salish textiles from the MOA collection. The main goal is to identify the mordants (metallic salts which alter the colour of dyes and permanently binds them to the textile fibre) used on two 19th century Coast Salish blankets using X-Ray Fluorescence (XRF) a non-destructive technique which quantifies the amount of heavy elements in a sample in parts per million. The Coast Salish are known to have used copper, iron, and urine as mordants however it is also possible they used introduced mordants such as chrome or tin. Other than mordants, inorganic compounds such as diatomaceous earth - a natural insecticide used by the Salish may also be present on the textiles and identifiable using XRF. Preliminary findings show that neither of the weavings used tin or chrome mordants. One blanket demonstrates an apparent relationship between dye colour and concentrations of copper. Diatomaceous earth is likely present on one blanket as shown by high counts of silicon and aluminum. This research aims to illuminate artistic traditions which were disrupted by colonialism and bring the findings back to the Salish Weaving community.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: iCON: The impact of interdisciplinary, culturally relevant health education on improving health outcomes in South Asian and Chinese minority participants

Presenter(s): Harleen Chohan, Tina Cheng

Abstract

Approximately 30% of British Columbia's population consists of minority populations, of which 26% and 37% are South Asian and Chinese populations respectively. Ethnic populations bear a disproportionately sizeable chronic disease burden, and overcoming unique cultural/linguistic barriers, which impair their ability to navigate the healthcare system, is essential for managing this issue. This project focuses on the effectiveness of panel and lecture style presentation series delivered by an interdisciplinary healthcare in improving participants' knowledge and management of health conditions, willingness to adopt lifestyle changes, and confidence in navigating BC's healthcare system. This was done through free of cost, chronic disease management health forums held in minority population dense areas: Surrey and Richmond.

382 Chinese and 300 South Asian participant data were recorded using surveys from two health forums between October 2016 to March 2017. Part A of the surveys inquired about participant demographic profile, such as age, level of education, income, English proficiency, healthcare challenges faced and confidence in ability to navigate healthcare resources. Part B focused on the evaluation of the health forum in improving participants' knowledge, and self-management/ prevention strategies. Participants were also invited to share a small or significant change they would like to make in their health behaviors. Post forum interviews were conducted after two months to assess the sustenance of their chosen change. Our results will demonstrate the role of interdisciplinary, culturally relevant health information in improving cultural minorities' health outcomes in BC, through willingness to make lifestyle changes and ability to access resources.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Universal, and Culturally-Specific Emotional Cues in Traditional Chinese Music: A Listening Response Study

Presenter(s): Cherise Kwok

Abstract

The notion that music can predictably evoke emotional responses in a listener is a basic assumption of a number of approaches to music therapy, but distinct music therapy methodologies suggest differing views on the nature of emotional cues in music. Some imply that certain emotional cues are more or less universal and thus are broadly useful in therapy settings, while others imply that emotional cues are culturally specific and therefore should be tailored to the specific musical culture(s) most familiar to a specific patient. This study seeks preliminary evidence for whether listeners draw on “universal”, or “culturally specific” emotional cues while listening to selected examples of traditional Chinese music. The study uses a questionnaire to identify enculturated, and unenculturated participants. Participants will hear two different recordings, and while listening to each, use keystrokes to mark moments that elicit a strong emotional response. Their keystrokes are recorded as exportable timepoint data using Sonic Visualiser software. Participants will then be asked to describe the emotion they felt at each identified timepoint using labels in Sonic Visualiser. Tightly clustered timepoints across participants would indicate an emotional cue within the span of music near that cluster. If clustering among timepoints identified by enculturated listeners matches clustering present in timepoints identified by unenculturated listeners, it would suggest that listeners are responding to a universal cue. If clustering among timepoints identified by enculturated listeners does not match the timepoint data identified by unenculturated listeners, it would indicate that the enculturated listeners are responding to a culturally specific cue.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: What is the nature of global health in undergraduate education in Canada?

Presenter(s): Aishwarya More

Abstract

With the growing importance of international cooperation and collaboration in recent times there has been a marked increase in the number of global health opportunities offered by health education programs. The nature of these opportunities varies greatly depending on institutions. The research examines how post-secondary institutions in Canada offer their global health opportunities to gain a better understanding of what exists and remains omitted or can be built upon in these programs. Literature from the past 10 years was reviewed with attention to the population, discipline, delivery or mode of teaching, and the core components offered as part of the experience. This review was guided by focused ethnography that facilitated insights into the nature of global health opportunities across Canada through an open-ended survey with students and educators seeking to identify common and divergent aspects being offered. The results highlighted strengths and weaknesses identified in both the literature and collected through the focus groups. Components of the experiences highlighted included that institutions had similar and varying approaches to elements of the curricula, modes of teaching and occupation of instructors, methods of student assessment, nature of pre-departure training, and student evaluations of the programs. This research provides us with a benchmark from where institutions can continue to develop innovative ways to engage in global health with particular attention to improvements suggested by students and educators who have been involved in global health opportunities.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Individual and Society

Title: Sugar Consumption and Tooth-brushing Behaviour in Canadian Adolescents

Presenter(s): Gary Yen

Abstract

Due to the importance of the transition from adolescence to adulthood, the value of gaining new insight regarding healthy behaviours and the well-being of adolescents is becoming significantly more crucial to understand. The objective of this study is to examine the relationship between sugar consumption and tooth-brushing behaviors in Canadian adolescents and to compare the two behaviours among different age groups and gender. Data from the 2014 Health Behaviour in School-Aged Children (HBSC) was used in this study. Preliminary results showed that 33% of Canadian adolescents brush their teeth less than the recommended guidelines and about 67% brush twice a day. Out of these adolescents, 10% have high sugar-sweetened beverage consumption, whereas 90% have low sugar-sweetened beverage consumption. Furthermore, despite sugar-sweetened beverage consumption being relatively similar between boys and girls, girls have higher brushing frequency compared to boys. In addition, with the increase in age, adolescents tend to brush more frequently yet consume more sugar-sweetened beverage. Possible determinants regarding this pattern of tooth-brushing behavior and sugar-sweetened beverage consumption are discussed. Future implications of the research can be to examine the trend of tooth-brushing behaviours and sugar-sweetened beverage consumption across several years or across different countries, as results may suggest changes in the education in developing healthier tooth-brushing behaviours that are tailored towards adolescents.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Effect of light wavelength on chloroplast length in wildtype *Euglena gracilis*

Presenter(s): Rishi Gupta, Deep Dhot

Abstract

Understanding the ability of *E. gracilis* to change its chloroplast parameters due to changes in external environmental light conditions is important to further consider the physiological processes that underlie these organellular changes. It is important to consider that any change in chloroplast structure or function may influence the density of certain salmon species since many salmon species feed on *E. gracilis* through a bottom-up trophic cascade. The objective of the present study was to determine whether exposing *Euglena gracilis* to different wavelengths of light affected their mean chloroplast length. *Euglena* cultures were incubated in culture tubes surrounded by coloured acetate paper, black plastic, or transparent acetate paper in order to manipulate the wavelengths of light the organisms were exposed to. In total, there were 5 different light treatments: red, green, blue, normal light, and no light. Samples were fixed and chloroplast lengths were measured using a compound microscope at 1000X magnification.

We failed to reject the null hypothesis and conclude that the mean chloroplast length of *Euglena* cultured under different wavelengths of light does not differ ($p\text{-value} = 0.0633$, $F(4, 10) = 3.169$). However, we did notice a trend: the no light treatment had a lower mean chloroplast length in comparison to the red, blue, green and the normal light treatments. This may indicate that the absence of light could be correlated with a decrease in chloroplast length.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Human expert versus computer: How do they compare when screening abstracts for a knowledge synthesis project?

Presenter(s): Jasmine Shi

Abstract

Background

Knowledge synthesis (KS) is research that entails the extraction of information from the literature to answer a question. KS is informative but often time and labour intensive for reasons not limited to the high volume of citations captured and abstracts requiring manual review. Automated screening tools are language-processing software that automate the review process and have the potential to expedite KS. Our objectives were to 1) develop an algorithm for screening abstracts, and 2) test its performance to determine feasibility.

Methods

We coded a screening program (SP) using simple keyword search strategy in Python 3.6. The SP was created based on a priori KS review criteria for a project in the field of swallowing disorders. We tested performance of the SP by comparing its results to that of the reviewer through quantitative and qualitative analyses.

Results

In quantitative analysis, the SP achieved 35% precision, 94% sensitivity, and 54% workload saving. In qualitative analysis, the discrepancies between the SP and the human results were reviewed. The most common error in the SP was misinterpretation of the context of the keyword, lacking the ability to inference as humans can.

Conclusion

The strategy of keyword screening is feasible given the adequate performance, however there were fundamental differences between the SP and human reviewers. While our SP may not replace human reviewers at the abstract stage, this approach could be used as a preliminary filter to reduce the number of abstracts reviewed. This has the potential to increase productivity and project costs.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Solving the Light Scattering Limitation of Optogenetics

Presenter(s): Parsa Seyfourian, Wendy Yang, Tricia Villegas, Jean Zheng

Abstract

Optogenetics is a fairly recent and innovative technique to gain optical control of cells. It allows for cells to go under a change that allows for cell depolarization or hyperpolarization, and neural activation or silencing. Genetically engineered cells that have a light-sensitive opsin are targeted by blue light to allow for this change to happen. However, this technique is highly limited by light scattering, where almost all of the light is lost during application through media such as the skull or brain. To resolve this, photonic probes have been prototyped to be implanted in the brain and respond to modified wavelengths of light. Since these photonic probes can be scalable, they would respond to specific wavelengths. The lights with reduced wavelengths can penetrate through the shallow regions of the brain and reach deeper tissues that previously could not be stimulated. By employing these probes, the light intensity can be maintained up to 100 μ m before clear light scattering occurs. Even then, at a distance of 200 μ m from the probe, the scattered beam width is less than that of a neuron cell. The use of a probe limits light scattering from application through the skull or outer layers of the brain, maintaining most of the light intensity. Thus, the photonic probes' ability to hyperpolarize and depolarize cells in optogenetics could be applied to stroke patients through the preservation of the ischemic penumbra. By controlling the cells within the penumbra, this enables facilitation of blood flow to the damaged area which may enable functional recovery of the stroke patient.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Synthesis and characterization of novel bifunctional chelators for therapeutic and diagnostic application

Presenter(s): Valeria Narykina, Nicole Sarden

Abstract

Radiopharmaceuticals are a class of compounds that combine radioactive isotopes within an organic framework known as a bifunctional chelator. As can be implied from its name, a bifunctional chelator has two main functions: to tightly bind a radioactive metal and deliver it to a desired site using a targeting vector. They are powerful agents in diagnostic imaging and targeted cancer therapy. The main challenge is finding a perfect combination of radioactive isotope and a bifunctional chelator. Minor changes in metal size and atomic composition of the chelator can have drastic effects on radiolabelling conditions, stability of the chelator-isotope complex and its biodistribution. If the chelator is not optimal for a particular metal, it can result in the loss of the radioisotope in vivo, which will damage healthy tissues. Our goal is to explore the synthesis of two novel bifunctional chelators - Noctapa and H4-py4pa and study the properties of their metal complexes with ^{212}Pb , ^{225}Ac and ^{227}Th . These radioactive metals are excellent candidates for use in targeted cancer therapy. Having customized bifunctional chelators can improve targeting potential and diminish side effects resulting from the loss of the metal from the bifunctional chelator. We are expecting that these novel chelators will have faster radiolabelling under mild conditions and form more stable complexes with ^{212}Pb , ^{225}Ac and ^{227}Th compared to the go-to bifunctional chelators currently used with these metals. So far, H4-py4pa have demonstrated fast and quantitative radiolabeling with both ^{225}Ac and ^{227}Th at room temperature, with excellent in vitro stability.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Training of deep convolutional neural nets to recognize radiomic signatures of tumors

Presenter(s): Jiwon Kim, Sophia Seo

Abstract

Cancer is a debilitating disease that affects millions of people worldwide (Bray, 2018, CA Cancer J Clin). Medical imaging, particularly positron emission tomography (PET), contributes significantly to early detection of tumours. Assessment of tumour images is typically performed via visual examination, and hence subject to human error and inter-observer variability (Miller, 2013, JNM).

Recently, two quantitative paradigms have emerged, enabling a more consistent and unbiased assessment: 1) radiomics, where manually-defined features that quantify tumour shape and texture are computed from the images, and 2) an artificial intelligence method termed "deep learning", where relevant features are learned automatically by an artificial neural network. The latter approach is newer and more general; however, it is unknown whether it can completely replace radiomics.

Our objective was to test the ability of deep convolutional neural networks (CNNs) to estimate tumour features - shape and texture - directly from the images. To this end, we simulated tumour PET images using a stochastic computational model of tumour growth. The features were computed from the simulated images, and the CNN was trained to estimate the feature values. Statistical analysis of the ground truth and CNN-inferred feature values was performed.

Initial results demonstrate that the CNN can estimate the feature values with 10% to 30% error, with clear propensity for learning and further accuracy improvement. This suggests that deep learning indeed represents a more general and powerful approach than radiomics and may therefore improve the quantitative assessment of tumour growth and response to treatment, yielding better health outcomes.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: VARBIS: Virtual Acoustics: Real-time Binaural Simulation

Presenter(s): Anders Grasdal

Abstract

Virtual Reality (VR) is an area of increasing research with an expanding scope of applications including education, entertainment, and therapy. Audio processing in VR settings often neglects or insufficiently models the impact of the listener's body on incoming sounds. This can lead to lessened immersion as the sounds do not behave as the listener is accustomed to. Head Related Transfer Functions (HRTFs) are a technique which can simulate these interactions. VARBIS consists of a wireless head-tracking device and a generic HRTF playback unit with support for four discrete simultaneous sound sources. The system processes the sounds in real time and accounts for the current position and orientation of the listener's head. Scenes created in this environment are played for listeners through wireless headphones which let them to explore the scene unimpeded. The current version without position tracking allows the listener to explore a scene by moving their head and selecting from pre-programmed positions. In the future VARBIS will be used with active position tracking to create a 3D audio installation that the listener can move through.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard



Theme: Innovation and Technology

Title: Using a Digital Multimedia Platform to Teach Anatomical Sciences

Presenter(s): Kamal Moghrabi

Abstract

The Doctor of Medicine Undergraduate Program (MDUP) has employed video tutorials including anatomy procedures, to prepare students ahead of attending gross anatomy laboratory sessions. The theory is that students who watch these videos will be better prepared to maximize learning from the laboratory sessions, using this time more effectively to achieve learning outcomes. This project produced a video to support the MDUP video series, offering a gross anatomy laboratory dissection guide to outline and present significant anatomical and physiological components of the chest and lungs. Through student survey feedback, we determined the usefulness of videos in helping students achieve anatomy learning objectives and which areas of the videos were most helpful in doing so. If successful, the content of this video production can also be incorporated into the curriculum of other disciplines (healthcare related or otherwise) including, but not limited to, the physical therapy programs, doctor of dental medicine (DMD) programs, bachelor of nursing programs (BSN), and undergraduate physiology and kinesiology degree programs.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Innovation and Technology

Title: Differentiating metabolites in R.macaques using a Multi-omic Approach

Presenter(s): Kimia Nozadi

Abstract

Metabolomics is a novel, bioanalytical approach to the field of genetics as it has been found to reflect the underlying biochemical state of both cells and tissues within an organism. The noninvasive nature of metabolomics makes for an ideal research method with the potential to track the trends of our own metabolome for drug and treatment purposes with more precision than prior tactics. Rhesus macaques are widely utilized in the field of biomedical research as a nonhuman primate species due to their genetic and physiological similarities to Homo sapiens. Although Rhesus monkeys have made contributions towards the development of biology and various disciplines, little has been investigated into the mechanisms behind the biochemistry of their metabolome. Recent studies suggest that rhesus monkeys can be used to effectively model human infant metabolism, pathogenesis and immunity. Unfortunately, results have often been gender-neutral. In this study, we aimed to differentiate metabolites in male and female macaques using a multi-omic approach.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Investigation of How Temperature Impacts the Growth Rate of *Tetrahymena thermophila*

Presenter(s): Jocelyn Cheng, Sung Ju Lee

Abstract

Global temperatures are increasing as a result of climate change (Hansen et al., 2010). Alterations in temperature have the potential to significantly impact all ecosystems and the species that inhabit them. *Tetrahymena thermophila* (*T. thermophila*), a freshwater phagocytic ciliate, is one of many species that may be impacted by rising water temperatures. The objective of this study was to measure the differences in the population growth rate of wild-type *T. thermophila* at 11°C, 20°C, 30°C, and 40°C, respectively. This experiment was executed by initially diluting the stock solution of *T. thermophila* with *Tetrahymena* media, SSP growth medium. This step was performed to provide optimal conditions and avoided restricting growth rates of *T. thermophila* by limiting space and nutrients. A sample was taken to be counted at each respective temperature every 2 hours for a total of 8 hours and lastly, at the 26-hour mark to complete the growth curve. A one-way ANOVA analysis was performed comparing the growth rates of different temperature treatments and a p-value of 0.04706 was obtained. Then, using a post-hoc Tukey-Kramer HSD test on the one-way ANOVA results, it was determined that there was a significant difference in the population growth rate for the 11°C and 40°C treatment groups. Thus, with 95% confidence, temperature does in fact have an effect on growth rate. Overall, it was noted that as temperature increases, growth rate increases as well. With continued warming of water temperature with global warming, *T. thermophila* will outcompete other plankton species and thus, offsetting the well-balanced food chain.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Exploring Groundwater Options for the City of Vancouver

Presenter(s): Beste Pazarozuyurt

Abstract

As climate change starts showing its effects more, water usage has been getting more attention. In the greater Vancouver area, the groundwater that is pulled out for construction is being pumped into the sewer system, which is out its limit for Vancouver. So the City has been looking into how they can the groundwater. The aim of the report is to look into the viability of groundwater use in an urban environment. The study discusses case studies that align with environmental constraints and objectives that Vancouver may wish to employ. These case studies include groundwater viability information in Sydney, Australia; Orange County, California, USA; Yakima, Washington, USA. Although these areas do not share the same climate or hydrology as Vancouver, they are cases where the governing bodies have identified water resources as a priority and explored conjunctive use of groundwater with surface water and reuse sources to develop resilient water supply systems. Based on these cases, conjunctive use of groundwater with surface water and reusing sources are being recommended for the case of general Vancouver area. Given the sewer system is near full capacity, using groundwater as a source and implementing it with conjunction with surface water would help the water resiliency of the city.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Determining the efficacy of motion activated sprinkler deterrents to improve human-coyote coexistence in Vancouver, British Columbia

Presenter(s): Brynn McLellan

Abstract

Human-coyote conflict has become a growing issue in urban environments. Non-lethal deterrent devices can improve human-wildlife coexistence in urban settings by deterring coyotes from residential areas and reducing the number of coyotes lethally removed due to human-coyote conflict. While previous literature has focused on the use of light, auditory and olfactory deterrents for coyotes in rural, agricultural environments, there have been no studies assessing the efficacy of tactile deterrent devices for urban coyotes. The aim of this study is to determine the short-term efficacy of motion activated sprinklers for deterring urban coyotes from residential areas in the metropolitan region of Vancouver, British Columbia. Motion activated trail cameras were used to monitor the presence of coyotes in residential yards over two 30-day phases: a pre-deterrent phase when trail cameras were present, and a treatment phase when trail cameras and a motion activated sprinkler were present. Preliminary results from one study site indicate a reduction in the frequency of coyote visits by 72% after the placement of the deterrent device. Preliminary results suggest that sprinklers may be a method to reduce coyote presence in urban, residential areas for the short term and can inform urban coyote management practices to improve human-coyote coexistence. Future research is required to determine the efficacy of sprinkler deterrents for longer time periods.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Moss Under Pressure: How Wide Are Your Hyaline Cells?

Presenter(s): Louisa Tambunting, Nicole Jung

Abstract

Sphagnum, a type of moss, is integral to forming peat bogs. Peat bogs are a type of wetland environment essential for the world's carbon storage and biodiversity. Peat bogs, however, are at risk of dying due to human activity. Understanding Sphagnum's water retaining abilities is vital for conserving peat bogs as global temperatures rise. Sphagnum, since they do not have roots, use hyaline cells to store water. If Sphagnum dries out, hyaline cells release stored water. This water-release, known as air-seeding, occurs as increasing pressure outside the hyaline cell squeezes an air bubble into the cell. This causes the displacement of stored water from the hyaline cell into the surrounding tissue. In other words, the differential pressure between the inside of a hyaline cell and its surroundings controls the air-seeding process. The factors that influence air-seeding, however, have not been deeply explored. We use a novel approach to investigate the effect of hyaline cell width on differential pressure during air-seeding through microscopic analysis and the Hagen-Poiseuille equation. The Hagen-Poiseuille equation is an equation that relates a liquid's flow rate (in our case, water) through a cylindrical pipe and the differential pressure between the pipe's interior and its surroundings. Our results are consistent with previous research: as the average cell width increased, the mean differential pressure decreased. We found, however, that larger cell widths had a greater variation in differential pressure. This did not match trends in past studies, which suggests air-seeding may be more complicated than previously imagined.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Location Confirmation of Sockeye, Chum and Pink Salmon Species on the Coast of British Columbia

Presenter(s): Simryn Atwal

Abstract

Migration patterns of Pacific Salmon are changing, and previous literature has suggested that monitoring species location and abundance is essential in recording their dynamic patterns. The constant movement of salmon migrations in open ocean has posed limitations to standard population monitoring models, however using commercial catch survey methods as the fish return to predictable spawning locations could resolve this problem. Commercial catch survey methods utilize fisherman catch as a cost-effective way of attaining many samples in a short period of time to monitor salmon populations but have not been employed for monitoring British Columbia (B.C) salmon populations. Therefore, we conducted a survey of salmon species using samples from 13 fisherman selling at Steveston Harbour, Richmond, B.C to provide a snapshot of confirmed salmon species in various locations where they were caught along the coast of B.C on October 28, 2018. Our data is a preliminary step to creating model tracking population abundance and migration patterns, which would require a compilation of many similar snapshots. Analysis of samples from fisherman using DNA isolation and PCR techniques yielded a broad geographical distribution. Sockeye (*Oncorhynchus nerka*) were found in Nanaimo and the Fraser River, chum (*Oncorhynchus keta*) were found in Nanaimo and the Lasqueti Islands, and pink (*Oncorhynchus gorbuscha*) were found in Haida Gwaii. This information can be used as preliminary data towards a larger scale projection of salmon populations and migration patterns.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: An Exploration on the Productive Methods of Microalgae Biofuels Production

Presenter(s): Ophela Zhang, Bhavi Polavarapu, Alina Chalaunchpong

Abstract

In exploring the cost effective and highly productive methods of microalgae biofuels production and extraction, this project aims to maximize the productivity of microalgae to reduce the costs of production that prevent it from becoming a feasible alternative fuel source. The species of microalgae used in the project, *Chlorella vulgaris*, is optimal for wastewater treatment as well as the production of biofuels. Through growth in synthetic wastewater, microalgae can be used as a treatment to reduce levels of phosphates and nitrates. Ionic liquids extraction is able to efficiently separate the grown algae into lipid-rich and sugar-rich components, providing the opportunity for simultaneous biodiesel and bioethanol production. Potential byproducts such as glycerols produced during transesterification processes in the production of biodiesel also contribute to upmost productivity when purified through their application in cosmetic, pharmaceutical and nutraceutical production.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Effect of Temperature on the Rate of Vacuole Formation in *Tetrahymena thermophila*

Presenter(s): Hannah Xiao

Abstract

Tetrahymena thermophila are protists that are primarily found in ponds near vegetated shores. *T. thermophila* undergo a physical transformation during feeding that involves the formation of vacuoles through phagocytosis. Since *T. thermophila* are involved in the freshwater ecosystem, and temperatures varies between location and season, it is important to know whether temperature will affect *T. thermophila* feeding. We visualize feeding by using black watercolour that is incorporated into vacuoles while they form. We incubate *T. thermophila* in 3 different temperatures (13°C, 30°C, and 34°C) to determine the rate of vacuole formation in temperatures under, in, and above their optimal range. We found that the rate of vacuole formation is not significantly different from each other in the different temperatures. This may be due to *T. thermophila* ability to correct oral abnormalities during development that may occur due to the temperature.

WAVE 4 | POSTER PRESENTATIONS

ABSTRACTS | 3:20PM - 4:30PM

Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Climate Change in the High Alpine Zone: Responses of Central Karakoram-Himalaya Flora

Presenter(s): Kelly Hurley

Abstract

Climate change significantly alters biodiversity and threatens alpine plant species' habitat. As suitable habitat shifts upslope in response to rising temperatures, the future of high-elevation species is uncertain. There is lack of direct floristic documentation in the Central Karakoram Himalaya. Many of these species are unique to the region, where they are restricted to north-facing aspects and limited elevation belts, making local extinction more likely. This project aims to provide a baseline documentation of species composition for future studies and to act as an indicator of climatic-related changes. By comparing this data with historical documentation from the early 20th century, we can learn more about factors influencing species' range shifts in response to climate change. Plant species were surveyed in five sites, along 50m elevation bands in the high alpine zone (3800 – 4400m) in order to document how plant species richness changed with elevation. We observed that the rate at which species were lost with increased elevation was the same rate at which they were gained. This means that there was not significant habitat mixing between altitudinally-distinct species, leaving us with further questions about competition, coexistence and the future of species found at the highest elevations. Looking ahead, we will soon begin comparing our data to historical sources from a century ago in order to quantify how Karakoram species' upper-elevation limits have changed. These data will help us better understand how climate change is altering some of the most fragile ecosystems on Earth.

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Ballroom || Ponderosa Commons: Oak House, 6445 University Boulevard

Theme: Sustainability and Conservation

Title: Investigating ploidy of Fraser River white sturgeon (*Acipenser transmontanus*) cultured at Vancouver Island University

Presenter(s): Csilla Vasarhelyi

Abstract

Sturgeon are considered ancient fishes, remaining relatively unchanged for millions of years. While scientists do not fully understand their success, one of the theories is the extreme plasticity in the sturgeon genome allows the fish to handle changing and challenging environments. White sturgeon are octoploids, they have eight full copies of each chromosome type within their genome. However, recent discoveries show that these fish can also be decaploid (10n) and dodecaploid (12n). The multiple ploidy levels within one species and even population lead to two umbrella questions; what causes these changes in ploidy, and what affects does this have on the fish? So far it is known that the genetic makeup of the parents (inherited polyploidy), hatchery practices (spontaneous polyploidy), and gamete quality have some influence with the ploidy of offspring, and that 10n sturgeon have delayed or non-existent reproductive potential. For proper management of the fish at the International Center for Sturgeon Studies, it is crucial to know what ploidy the fish have, and if spawning methods are altering the ploidy of the younger generations. This work can shed some light on egg maturation/spawning practices, broodstock management, conservation, and production of white sturgeon; it is a fundamental first step into better management and understanding of the sturgeon at the ICSS and will act as a baseline for future studies