

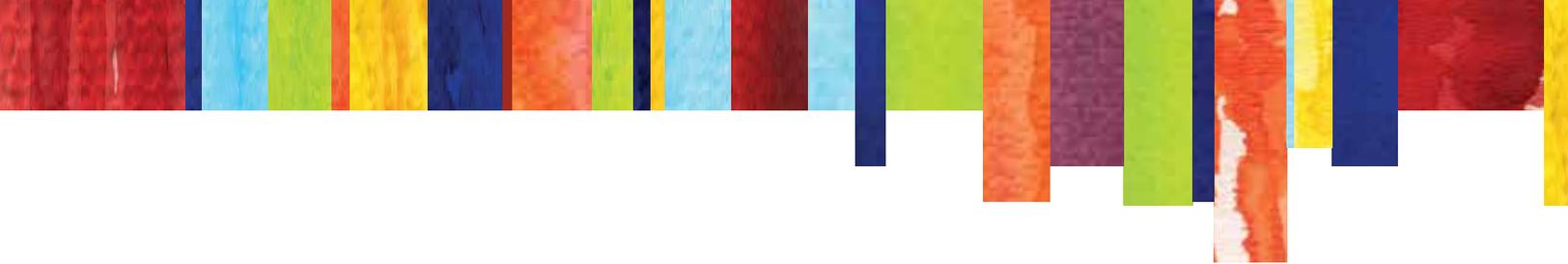
# FURCA 2018

March 12-15

The Festival of Undergraduate Research and Creative Activities (FURCA) is the U of A's campus-wide, interdisciplinary celebration of  
**YOUR QUESTIONS AND IDEAS!**

For more information and latest schedules visit [www.uab.ca/uri](http://www.uab.ca/uri). All events are open to the public.

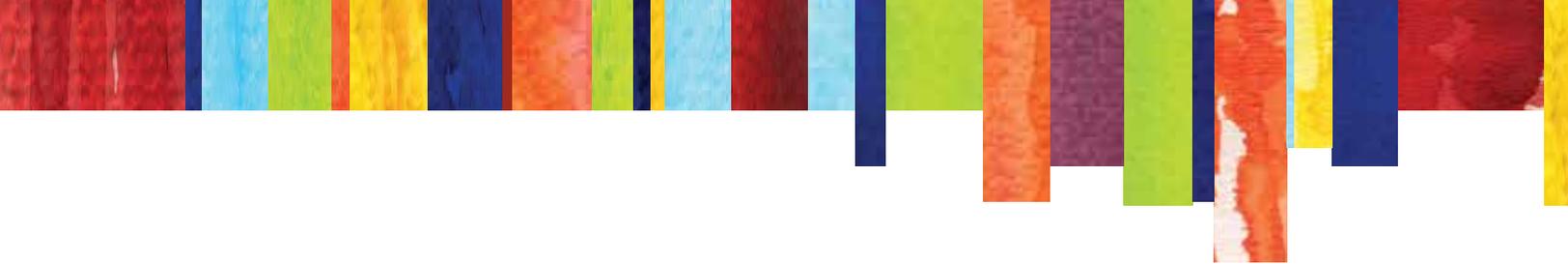




# Welcome

In 2011, the Students' Union, with the support of the Undergraduate Research Initiative, held the U of A's first Undergraduate Research Symposium with the goal of fostering cross-disciplinary awareness of undergraduate research and promoting broader student participation in research and creative activities. The success of the Undergraduate Research Symposium, along with a growing number of other, similar events on campus, provided the inspiration for a campus-wide Festival of Undergraduate Research and Creative Activities (FURCA), which celebrates the achievements of undergraduate researchers across all disciplines.

Over the years, FURCA has grown to feature an array of posters, performances, visual art exhibits, and oral presentations. This year, more than 100 students will present their work at FURCA, showcasing not only the disciplinary diversity across 14 faculties, but also the diverse perspectives of the presenters themselves.



## Thank you to our sponsors!

FURCA 2018 is made possible through the generous support of:

The Kule Institute for Advanced Study  
University of Alberta Faculty of Science  
University of Alberta Students' Union  
University of Alberta Faculty of Arts  
University of Alberta International  
University Wellness Services

## Special thanks to:

All faculty, staff, graduate students, postdoctoral fellows, and alumni who have generously volunteered their time to judge posters and presentations throughout the week.

University of Alberta Libraries, for their support in coordinating the judging process.

The staff of the Career Centre and URI's Peer Undergraduate Research Liaisons, for their support in planning and logistics.

The Dean of Students' Communications team, for their support in design and promotions for FURCA.

All of the undergraduate researchers, mentors, advocates and donors who are helping year-round to support a culture of undergraduate research at the University of Alberta.

Congratulations to all participants in the  
**FESTIVAL OF UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES**



Undergraduate researchers are the leaders of tomorrow. We are thrilled to be a part of your journey.

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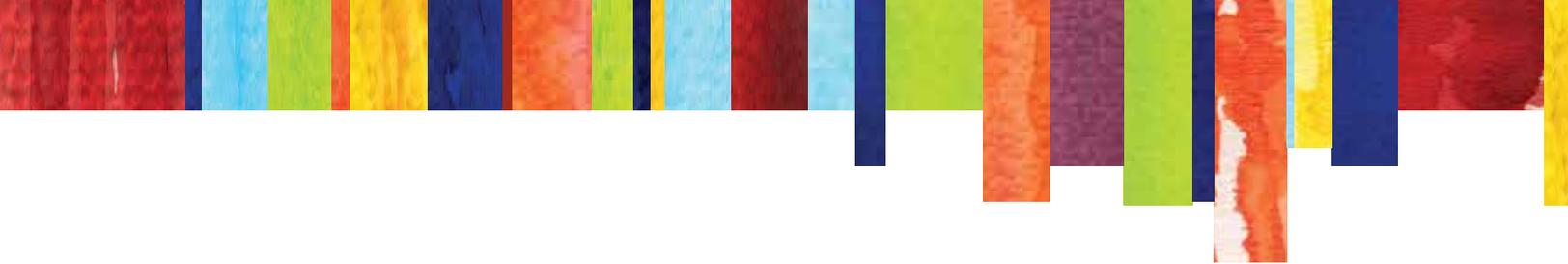
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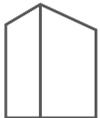
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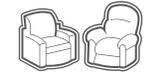
  
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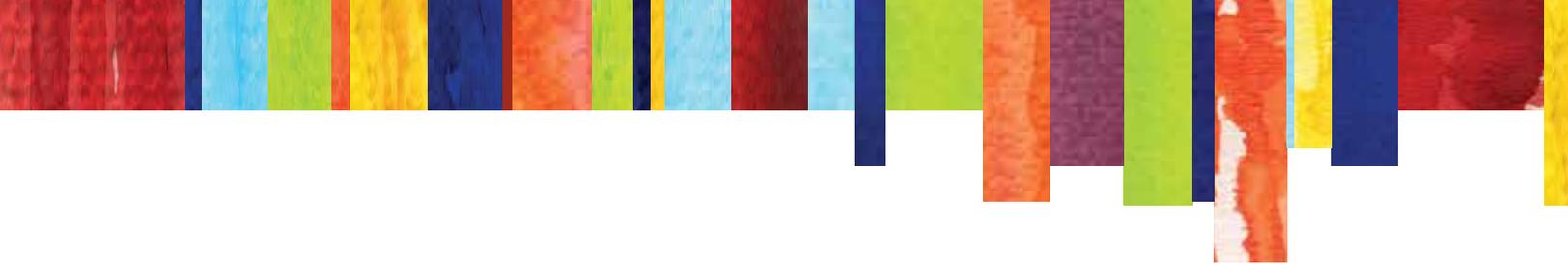
  
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# FURCA Schedule-at-a-Glance

This is provided as an overview only. For the most up-to-date detailed schedule, please visit [www.uab.ca/uri](http://www.uab.ca/uri). All events are free and open to the public; however, we ask you to please RSVP at the URI website, as this helps us estimate food quantities for catered events.

## Monday, March 12

- Performances (12pm-1pm, SUBStage)
- Visual Art Exhibit Presentations (1pm-3pm, Rutherford Galleria\*)
  - \*Exhibits in Rutherford Galleria will remain on display until March 31

## Tuesday, March 13

- Oral Presentations (10am-2pm, Tory Building, B-113, B-125)
  - RSVP here: <http://bit.ly/2ClfUMJ>

## Wednesday, March 14

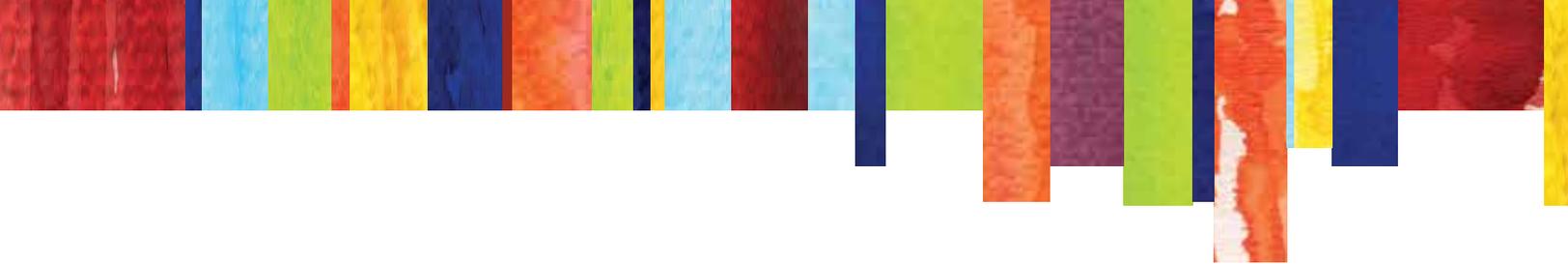
- Poster Symposium (10am-2pm, main floor CCIS)

## Thursday, March 15

- Awards Reception (5-7:30pm, Telus Atrium)
  - RSVP here: <http://bit.ly/2EHAA6w>

# Detailed Oral Presentation Schedule

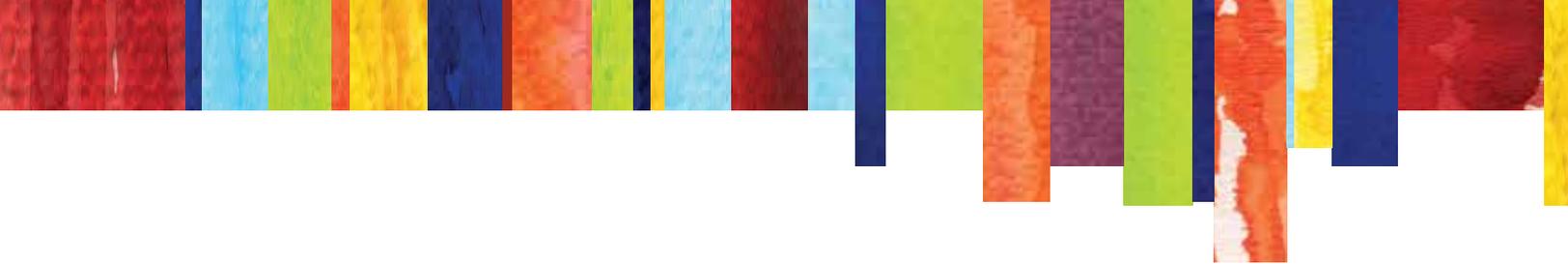
Time	Room 1 – Tory B113	Room 2 – Tory B125
10:00 AM – 10:20 AM	<b>017. Sarah Almas</b> Severe Asthma: an Allergic Disease with an Autoimmune Background?	<b>016. Kesia Dias</b> A Dual Role for TNF-alpha and S1P in Vascular Arterial Tone Regulation and Endothelial Function in Placental arteries during Pregnancy
10:20 AM – 10:40 AM		<b>05. Jonah Dunch</b> “Ahunwar: The Devil’s Long Nap”: Adapting Myth for the Contemporary Stage
10:40 AM – 11:00 AM	<b>01. Amira Assiou</b> Frequency-resolved dynamics of silicon quantum dots	<b>04. Reshma Sirajee</b> Healing Childhood Trauma through Storytelling
11:00 AM – 11:20 AM	<b>03. Joey Ting</b> Ecological Benefits of Trees	<b>07. Emile Vogel-Nakamura</b> Cost-Benefit Analysis of Alberta’s Carbon Levy: The First Four Years
11:20 AM – 11:40 AM	<b>011. Nicole Inglis</b> What Can Nurses Learn from Those with a Diagnosis of Schizophrenia?	<b>06. Gwendolyn Bracken</b> “He Left Me with Nothing at All:” Neglecting to Provide in Northern Alberta, 1914-1919
11:40 AM – 12:00 PM	<b>08. Susannah Mackenzie-Freeman</b> The Tasmanian tiger as a de-extinction candidate	<b>013. Dylan Kaseram</b> Diversity on the Board of Directors
12:00 PM – 12:20 PM	Lunch	Lunch
12:20 PM – 12:40 PM	<b>019. Alannah Piasecki</b> One Man Wolf Pack: A Dissection of Leaderless Resistance Models and ‘Lone Wolf’ Terrorism in the United States	<b>012. Feodor Poukhovski-Sheremetyev</b> This is your brain on neoliberalism: ideology as pathology
12:40 PM – 1:00 PM	<b>09. Hemptact:</b> An Innovative Solution to Sanitary Pads	<b>02. Kaelin Koufogiannakis</b> Rethinking zoning: an alternative to rigid and complex land use bylaws
1:00 PM – 1:20 PM	<b>015. Eden Redman</b> Real brains in virtual environments: An investigation of attention in depth using a novel depth P3 task	<b>010. Madison Pearson</b> Understanding literature on the Digital Divide: Global perspectives and Local Approaches
1:20 PM – 1:40 PM	<b>014. Leah Hrycun</b> Decolonizing the Classroom: Incorporating Land-Based Pedagogy in Canadian Universities	<b>018. John M. Evjen</b> Frat Boys’ Revolution: How Fraternities Can Become Sites of Resistance



## Awards Reception

This year, the Festival of Undergraduate Research and Creative Activities Awards Reception will be held on **Thursday, March 15th 2018, from 5–6:30pm at Telus Atrium**. This will be a night of celebration! Featuring performances from IOLA (an Edmonton dance group comprised of university students who dance to depict their cultural richness), the U of A's Bollywood Dance Club, and Daniela Hernandez & Ryan Seeras (a Bachata pair). These students will also be speaking on research and art!

We strongly encourage all FURCA presenters, peers, and members of the campus community to attend as we celebrate our growing culture of undergraduate research!

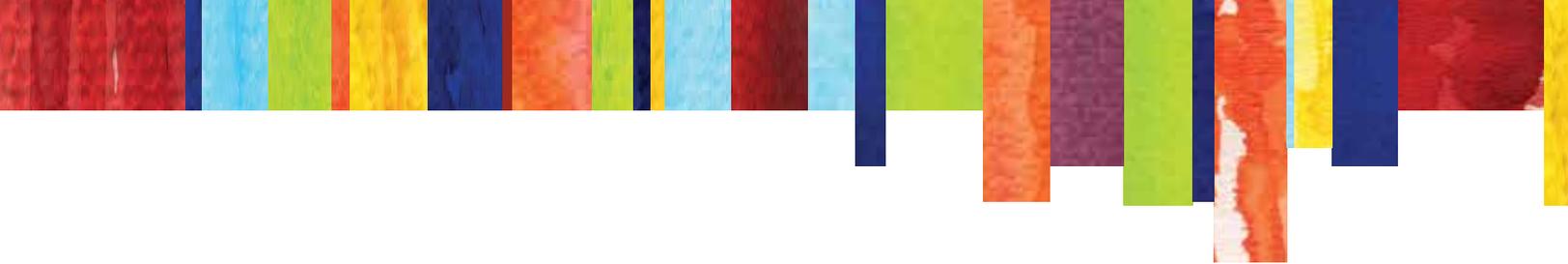


# C1. Flawed C2. Faded Memories

Area(s) of study: Social Sciences & Humanities

**Michael Taylor** | FACULTY OF MEDICINE & DENTISTRY

Creative expression is innately therapeutic. Over the past decade, I have used writing and performance art to convey diverse complexities of the human experience. Through creative writing, familiarities with love, death, failure, distress, and even anxiety often become opportunities for empowerment. As a story-teller, I attempt to share my personal and collective struggles with others. Through candid interpretation(s), I aim to build trust among my peers and inspire the medical community to optimistically tackle their own struggles. Vulnerability has allowed me to encourage catharsis with shared experiences while also informing my peers of their own potential to do the same. I hope to stir your contemplation of regret, guilt, and even joy by performing my poem, 'Faded Memories' and song 'Flawed'.

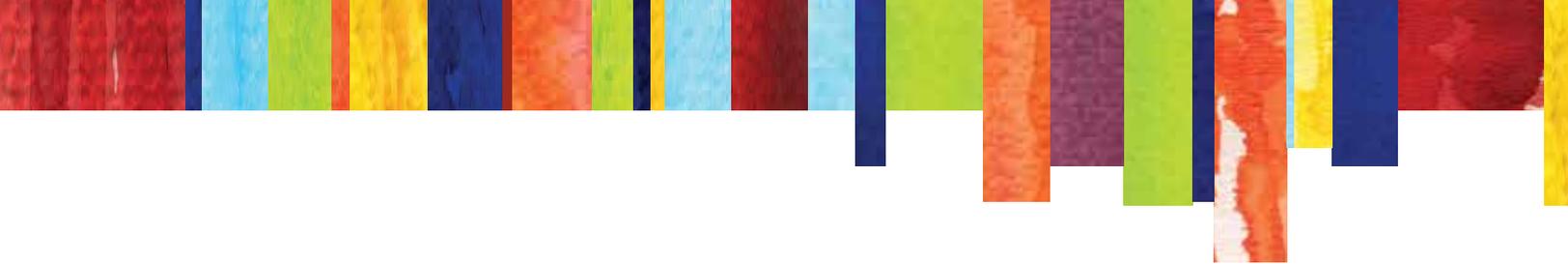


## C3. Enough?

Area(s) of study: Social Sciences & Humanities

**Eanimi Deborah Agube** | FACULTY OF ARTS

Through this poem, I question the many voices that are shutting down stories that should be heard. I try to question when the art of becoming “politically correct” became a way of excluding those who do not identify with problems of political correctness. With the broadened intersectionality that this generation chases, it makes it harder for people to feel enough in their own skins. This makes it so that people are left to search for a place in society. However, all they find is emptiness and a lack of belonging which leads to the questioning of identity. I understand, that identity can be about giving a voice to the voiceless, giving individuals the opportunity to either belong or to stand out. Identity is a great phenomenon, but with the politics that it comes with nowadays, the question we have to answer is when did the oppressed become the oppressors? When did we stop fighting for justice and started a witch hunt to destroy those that do not identify as we want them to? This issue makes the concept so difficult that freedom has become a farther reach for us, and it has made identity a politics that is difficult to understand. So my question is “when did identity stop being enough?”

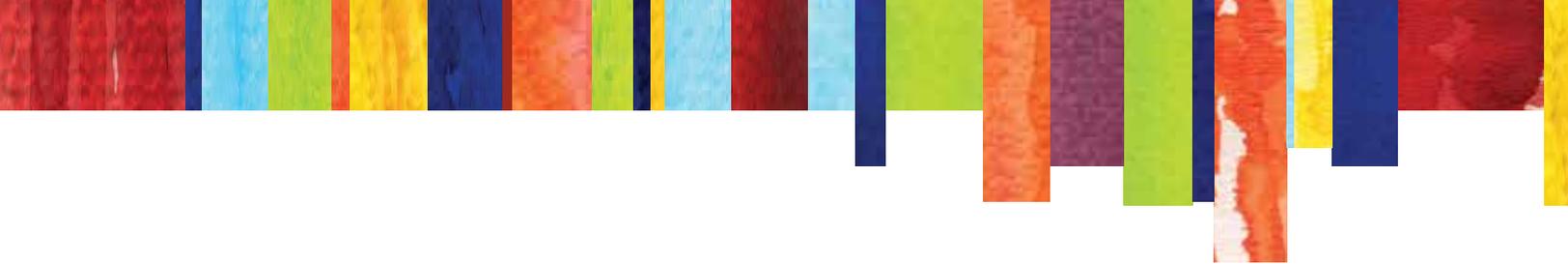


# C4. Minority Report

Area(s) of study: Fine Arts

**Tyra Banda** | FACULTY OF ARTS

Our classes final project in Drama 240, was to create a 10 minute “solo adventure” that was a collage project on whatever topic we wanted, and the adventure had to relate to ourselves as people. I decided to do the project on all the minorities I am (Black, Queer, Depression, etc), and i try to frame all these minorities I am as a positive rather than a negative. I do this through a series of short monologues, some that i wrote myself and some i borrowed from role models (ie: Viola Davis). This project and making it has really helped me with self love and acceptance.

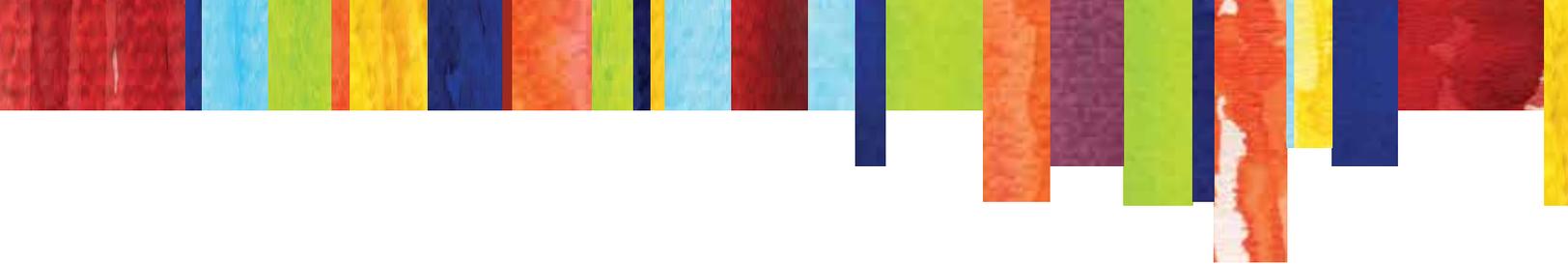


# C5. What (Black) Life Requires

Area(s) of study: Fine Arts , Other/Interdisciplinary

**Mpoe Mogale\***, **Lebogang Disele**, **Adesewa Adeleye**,  
**Brandon Wint** | FACULTY OF ARTS

What (Black) Life Requires is an interdisciplinary performance which fuses modern, contemporary and ballet dance styles with spoken word poetry to explore the resilience, ingenuity, diversity and brilliance of Black Life. The piece is a powerful expression of Black creative unity, diversity, and womanhood, which explores the tension between personal narrative and collective experience within the context of Black life in Canada.



## C6. 12 Pack

Area(s) of study: Social Sciences & Humanities, Fine Arts, Other/Interdisciplinary

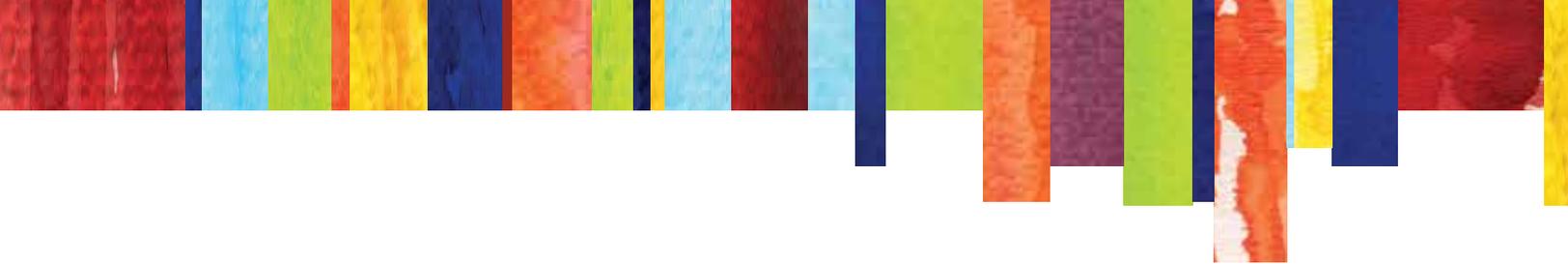
**Deano Dei** | FACULTY OF ARTS

If you're reading this, tell them the Tlicho fool sent you. I am a Dene woman born during a midsummer dream and my research reflects the hopes of an entire nation, the Tlicho nation, the nation I howl at the moon for. It is my duty as a spirit worker, storyteller, and healer. It is my duty to spread the dogspel because my ancestors have carved out a space for me since the very beginning. I don't know the dogrib legend for that, but I do know Sky Woman fell from heaven to give birth to two spirits. July 28th. Leo. Almost a full moon.

My debut album titled "12 Pack" will be released by the next kisepisim. That's Native American speak for New Years. I am using the methodology of a pseudo-science (astrology) to engage with my understanding of my Tlicho roots. Like astrology, we are thoroughly misunderstood. We are not simply ONE sign—we have all twelve inside of us. Astrology is the practice I brought with me to Unit 62—but here, we are soldiers of every faith and more. My songwriting must be condensed into 12 songs, a holy number, and maybe a few bonus tracks. This is difficult when we shine as bright and long as the sun. There must be some meaning about Treaty in this, but it's your job to find out.

I'm prepared to do a 20 minute set. I will have one guitarist, whether that is myself or my nicimos.

Don't forget. Watch me play. I need you to listen.

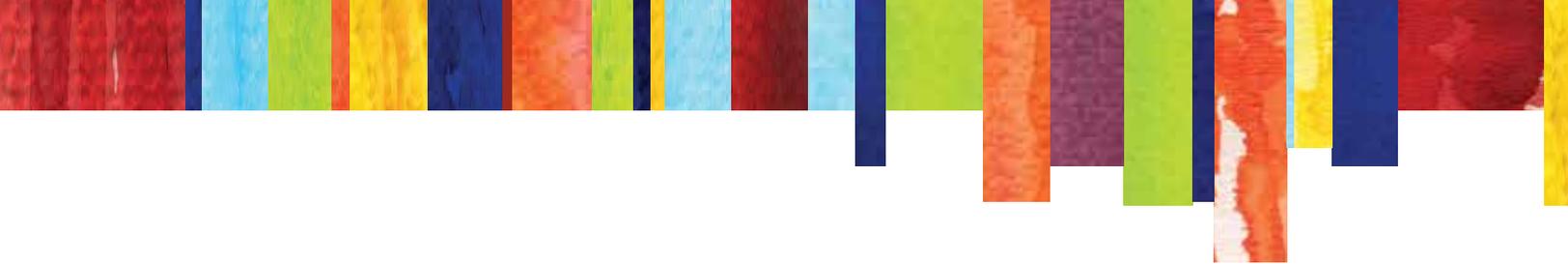


# C7. Understanding the Concept Belonging and the Link between Language and Social Capital

Area(s) of study: Social Sciences & Humanities

**Timiro Mohamed** | FACULTY OF OTHER

As a second generation immigrant much of my work centers around themes of home, displacement, belonging and coming to terms with a variety of identities. I hope to participate in FURCA by sharing spoken word poetry during the performance portion. Specifically, I hope to share my piece "Orchestra" which deals with the complexities of language, and the struggles of new immigrants. It simultaneously explores the trauma of losing one's language and culture as a second generation immigrant and the difficulties of coming to a new country as a first generation immigrant. Often new immigrants who carry a wealth of experiences and speak multiple are denied a number of opportunities due to language barriers. In a settler state which oppresses new immigrants and the Indigenous peoples native to these lands within the same postcolonial framework people of color are denied agency and voice. Ways of knowing, valuable cultural teachings and traditional ways of life do not translate to or hold value within a western framework. Furthermore, those who earn degrees overseas often spend many years trying to gain equivalency or in many cases do not have their education recognized. Post-secondary education grants one access to social and material capital and when minorities are systemically denied this access, it cuts off entire communities from many opportunities. Although all of these themes may not translate directly in a three minute spoken word piece, I touch on many of these ideas.

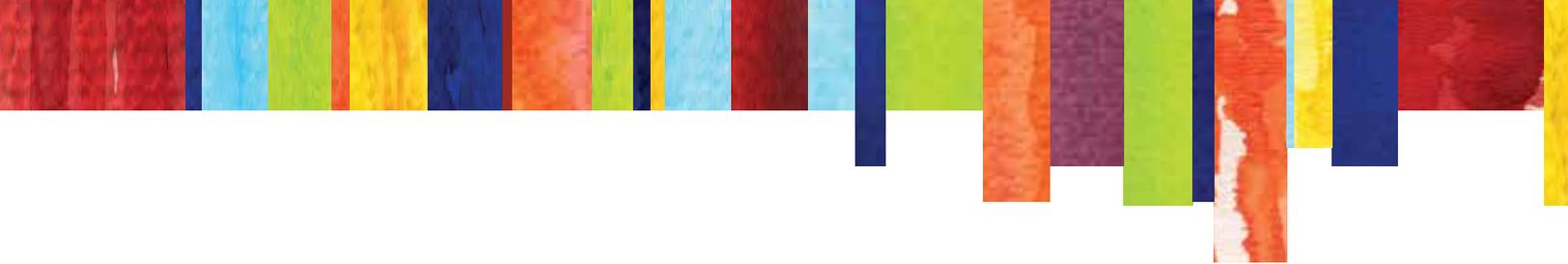


# E1. International Bound: Travelling while Young, Black & Muslim

Area(s) of study: Fine Arts, Other/Interdisciplinary

**Maymuuna Yusuf** | FACULTY OF EDUCATION

My research explores the experience and journey of taking my education outside of the folds of a traditional practicum in Edmonton. This piece of work demonstrates the challenges of pursuing something new and exciting, whilst keeping in mind the numerous obstacles awaiting in pursuing this trip. My methodical approach is a mix between journal entries and poetry, these two styles of writing worked together to express and highlight my experience from start to finish. I learned that in this day and age, we believe that there are too many things restricting us from pursuing what we want. While it is true in certain instances, we also serve as a roadblock in our own success. This piece serves as a personal reminder to myself as to what I was able to accomplish. This serves as an appreciation to the University for having programs like this for students. This serves as an encouragement to people who look like me and want to follow their aspirations despite the obstacles that face them.

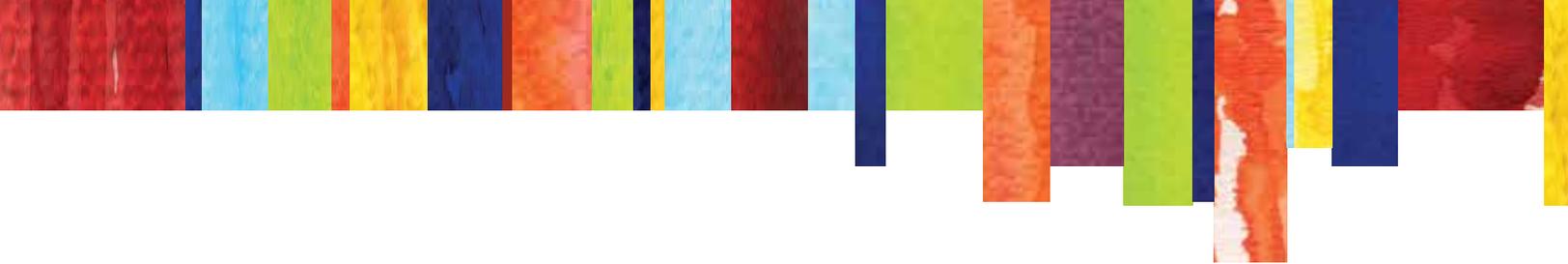


## E2. Re-creation of Pauline Baynes' Illustration in C.S. Lewis' The Chronicles of Narnia: "The Horse and His Boy"

Area(s) of study: Fine Arts

**Niabi Kapoor** | FACULTY OF ARTS

In my last year of high school, we did a project based on landscapes and scenery. The majority of students got their inspiration from scenic photography that they had either taken themselves or found on the internet. I decided to get my inspiration from my first and favourite book series, C.S. Lewis' The Chronicles of Narnia. Pauline Baynes' illustrations in these books captivated me from a young age. The vibrant hues and the use of color and ink (my favourite combination to work in) was something that added to my appreciation of the fictional stories. My rendition is of her drawing of Tashbaan from the fifth book in C.S. Lewis' The Chronicles of Narnia series: "The Horse and His Boy". Tashbaan is the capital city of Calormen, built on an island in the River Calormen at the northern border of the empire. I really hope that my version of her illustration does her work justice, and rekindles childhood memories about books or fictional escapes that students experienced when they were younger.



## E3. The ‘Self’ Within Self-Portraits

Area(s) of study: Fine Arts

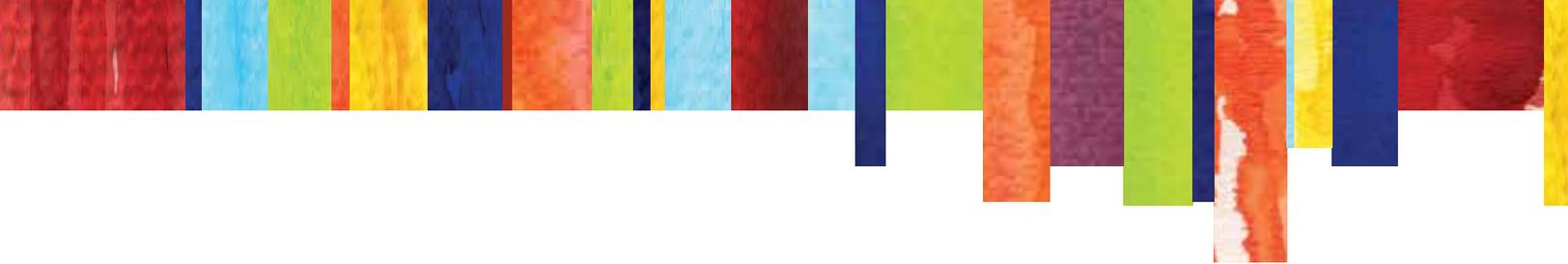
**Hibo Mohamed** | FACULTY OF ARTS

I'd like to submit my 3 self-portrait paintings done in acrylic paint. The work explores my identity and how I see myself. The work features the three self-portraits I painted from observation while looking in a mirror and using a clamp light as a source of light. All three paintings feature myself in the same pose, however, the color is different in each painting. The first painting is in black and white, which was challenging because I had a difficult time mixing and finding the right shade of grey to paint the color of my skin. I struggled to find the right shade is because there aren't many famous paintings of dark-skinned people like myself, therefore, I had no point of reference.

The second painting, I painted in pink, blue and purple. I choose these colors because they are feminine; and I wanted to deal with my hatred of femininity and its perceived weakness and of course, my internalized misogyny.

For the third painting, I painted myself in the natural colors. I see myself as an expressive person so I wanted to show that by using expressive brush strokes. I made many mistakes in this painting; like, the right is droopy and the position of the lips are too low. However, these mistakes enhanced the painting's beauty and appeal.

While painting these self-portraits, I learned about the under-representation of dark-skinned people in visual arts, I attempted to confront my internalized misogyny and I realized that mistakes are an important part of life that I shouldn't attempt to avoid. I hope these self-portraits and what've learned through them can show that art is worthwhile and important.



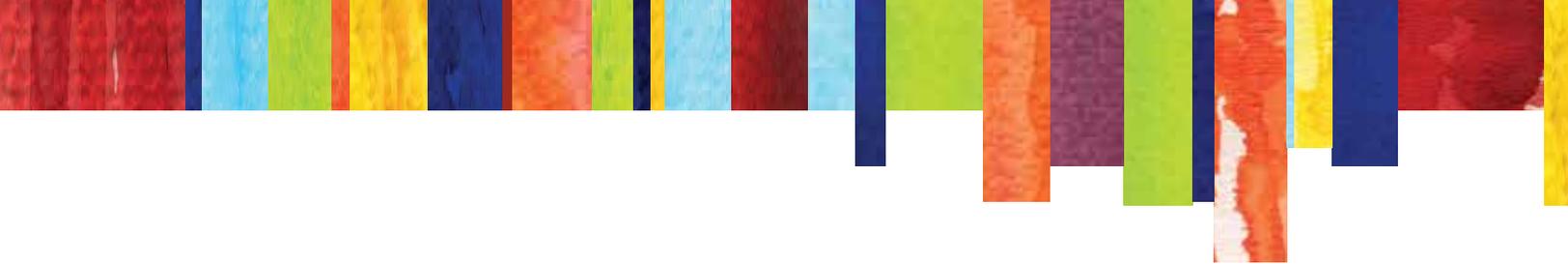
# E4. Mediating the Abstract Complexities of Climate Change Through Art

Area(s) of study: Social Sciences & Humanities

**Meghan Wise** | FACULTY OF ARTS

In the narrow context of people's daily lives climate change is a profoundly abstract concept. It is difficult to see the magnitude of climate change in the context of minutes, hours, days, or even weeks. Climate change is thus ethereal in one regard, yet an overt consequence of human modernity. Modernity and climate change intersect social, economic, and political realms of the individual, the species collective, and the global natural environment. In this presentation, I explore how art can expressively mediate the ambiguous presence of climate change in our daily lives. Using my own artwork, and drawing from the theories of Weber, Lukács, Hegel, Benjamin, Baudelaire, I seek to illuminate art's unique ability to convey meaningful and effective understanding of the difficult to define and articulate reality of climate change.

To do this I draw from philosophical, sociological, and political science to investigate how modernity breaks down meaning in our daily lives, making it hard for individuals to see large networks of association and meaning as intimately related to us as individuals. Networks that traverse time, species, class, ethnicity, gender, and land. Art, I suggest, allows for a visual, emotional, thought-stimulating reintroduction to important existing relationships that are obscured through the processes of modernity. Reconstituting meaningful networks through art can help to make sense of an abstract issue like climate change.



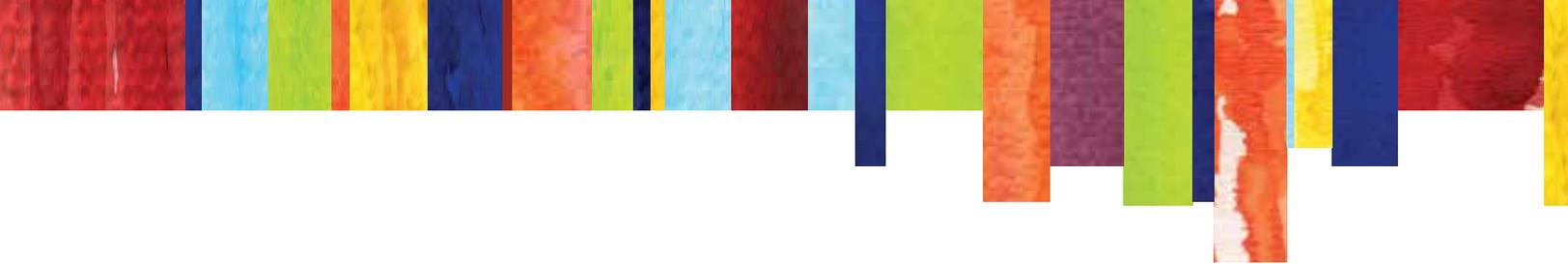
# 01. Silicon-Based Light Source: A Study of the Luminescence Dynamics of Silicon Quantum Dots

Area(s) of study: Natural Sciences & Engineering

**A. Aissiou\*, W. Morrish, M. Jakob, A. Islam, M. Greben,  
A. Meldrum** | FACULTY OF ARTS

Silicon quantum dots (SiQDs) represent an environmentally friendly, non-toxic nanotechnology being developed by chemists, physicists, and engineers for use in environmental monitoring, industrial process control, photonic devices, and optical displays. SiQDs have photoluminescent properties which give them the ability to “glow” when exposed to ultraviolet light. Essentially, when a SiQD absorbs ultraviolet light, it enters a higher energy or “excited” state. After some time, it returns to the ground state, emitting lower-energy radiation. This process is somewhat similar to the glow you might see on your analogue watch dial, but it occurs over much shorter timescales. Thus, a key point is exactly how long the luminescence takes to decay. Unfortunately, the luminescence decay times of SiQDs remain incompletely understood.

The object of this work was to use a frequency-based technique (called QFRS) for measuring the “speed” of the luminescence. This technique ideally allows one to extract more information from the sample than by merely measuring the luminescence decay time. Some unexpected results were uncovered, including a surprisingly fast luminescence process that we do not yet understand completely. Studying the luminescence of SiQDs with the QFRS method thus seems likely to contribute to a better characterization of the luminescent properties of SiQDs, which in turn might help overcome the technological barriers towards a generation of efficient silicon light sources.



## 02. Rethinking Zoning: An Alternative to Rigid and Complex Land Use Bylaws

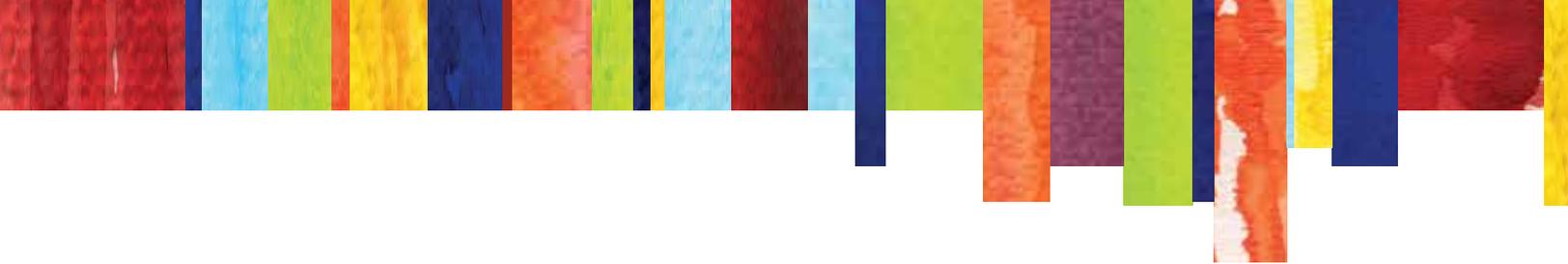
Area(s) of study: Social Sciences & Humanities, Other/Interdisciplinary

**Kaelin Koufogiannakis** | FACULTY OF SCIENCE

Zoning is one of the most fundamental and widespread tools available to urban planners. It involves the division of urban areas into zones in which only specified uses can occur, and the prescription of regulations and guidelines for the buildings and land within those zones. Throughout much of the 20th century, zoning emphasized a stringent separation of uses. In recent decades, planners have sought to promote a greater mix of land uses in order to create more livable and sustainable communities. In this study, I investigate key principles underlying both traditional and contemporary zoning bylaws, and suggest an updated approach that is more accessible to the public and more closely aligns with contemporary planning objectives.

The research involved a three-part methodology. First, I explored the historical and contemporary contexts of land use regulation. Second, I developed a local contextual understanding by reviewing the costs and benefits of Edmonton's current zoning bylaw and conducting key informant interviews with practicing planners. Third, I created an alternative zoning bylaw based on this context and the degree of political will for change.

This alternative bylaw seeks to address several shortcomings of traditional zoning, including overly complex regulations, limited flexibility, and a lack of design-based elements. As a mock-up, it is intended to influence Edmonton's Zoning Bylaw Renewal project taking place over the next three years. Ultimately, my research aims to improve the practical outcomes of zoning, and enable clear two-way communication between planners and citizens regarding the future form and design of Edmonton's communities.

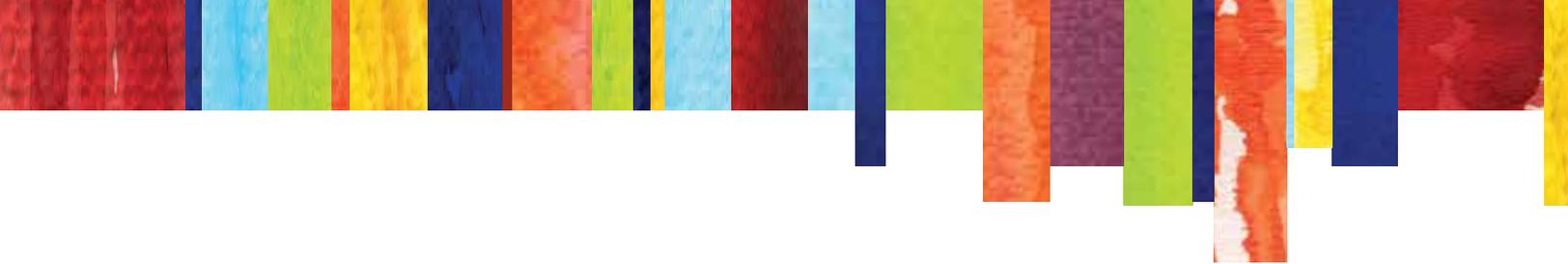


# 03. Ecological Benefits of Trees

Area(s) of study: Natural Sciences & Engineering

**Joey Ting** | FACULTY OF ENGINEERING

Trees are an important part of an ecosystem. They provide numerous benefits, such as carbon removal, pollution removal, and shade. Using the i-trees eco software, we attempt to provide a monetary value to each tree based on their ecological benefit. In the two fields that were surveyed, it was determined the trees provided 7 million pounds in structural value and over 1000 pounds in yearly benefits. This information will help aid in management decisions, as well as provide awareness to the importance of trees.

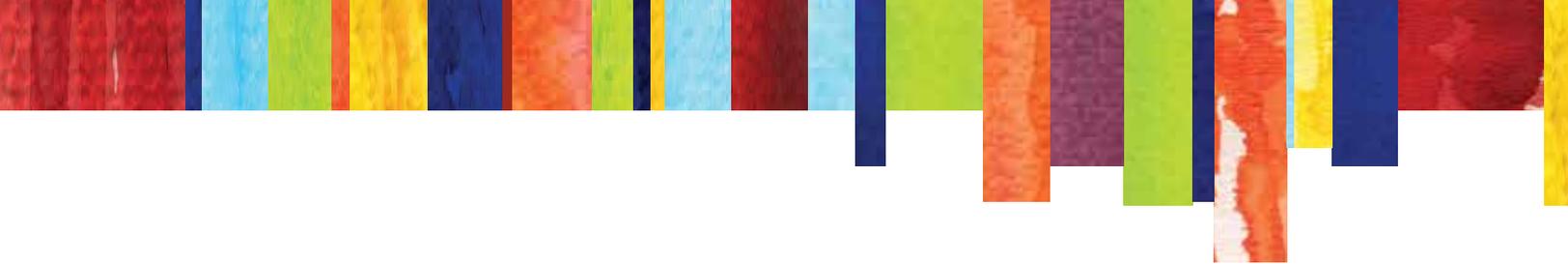


# 04. Healing Childhood Trauma through Storytelling

Area(s) of study: Social Sciences & Humanities, Other/Interdisciplinary

**Reshma Sirajee\*, Dr. Natalie Kononenko** | FACULTY OF SCIENCE

Non-profit organizations such as the Edmonton Mennonite Centre for Newcomers (EMCN) can provide the safe space for refugee, immigrants and other newcomers to help them integrate into Canadian society. In my work from last year, I worked with a Syrian refugee at the EMCN to create a map where he could narrate his challenges from growing up in the Middle East to coming to Edmonton and integrating into the culture. But what if the children do not have the story-building vocabulary to speak about their experiences? How can children tell the stories that will allow them to overcome the trauma that impacts physical, behavioral, cognitive functioning and relationships throughout an individual's lifetime? My thesis is that storytelling can help children as well as adults. The purpose of this research is to develop a story-telling template and to test it, finding out whether storytelling can provide the needed structure and distance to allow children to speak of their traumatic experiences and deal with the past. Our plan is to create a structured storytelling template for Kindergarten to Grade 6 students, giving them a starting point for creating a fictional story that will provide distance and flexibility to personalize the narrative. The template will be developed in coordination with the EMCN and we will use it to see if it helps children interact with community volunteers and share their fictional/non-fictional stories. We hope that a story template will give students the courage to narrate the past and move towards healing.

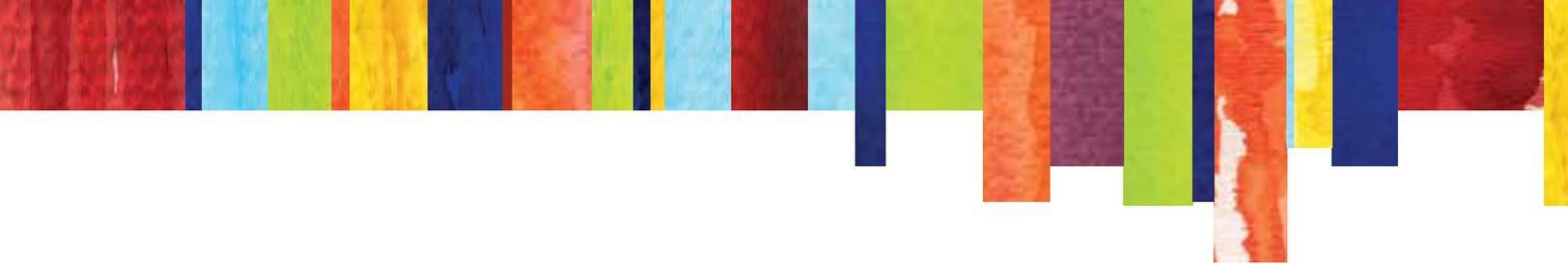


# 05. “Ahunwar: The Devil’s Long Nap”: Adapting Myth for the Contemporary Stage

Area(s) of study: Fine Arts

**Jonah Dunch** | FACULTY OF ARTS

How can a playwright discover and realize the dramatic possibilities of myth when adapting for the contemporary stage? This was the question which informed my playwright’s process when writing *Ahunwar: The Devil’s Long Nap*. I freely adapted the play from the *Bundahishn*, an early medieval Zoroastrian text describing the religion’s cosmology. In the *Bundahishn*’s third chapter, Jeh, a demoness, rudely awakens Ahriman, the supreme devil, from a three-thousand-year slumber. Jeh convinces the reluctant and cranky Ahriman to get up by exciting him with talk of annihilating their enemy, Ohrmazd, the supreme god. The episode’s idiosyncratic dialogue and immature characterizations of dreaded figures intrigued me. In my version, Ahriman awakes without memories or knowledge of his identity, and must come to terms with his self and his fated future. I investigate problems of cosmic justice, predestination, personal identity, and freedom in this contemporary approach to a story from another time and place. Through close reading of the source text, workshops with senior playwrights and dramaturges, and a staged reading with actors and a director, I developed successive drafts of this play, honing my writer’s craft while investigating the modern concerns of a medieval text. I intend for this creative process to serve as a starting point for future projects in adaptation – both in my own practice and in collaboration with my peers in the new generation of Canadian theatre artists – and hope to develop blueprints and best practices for adapting across genre, culture, language, and history in the contemporary global theatre.

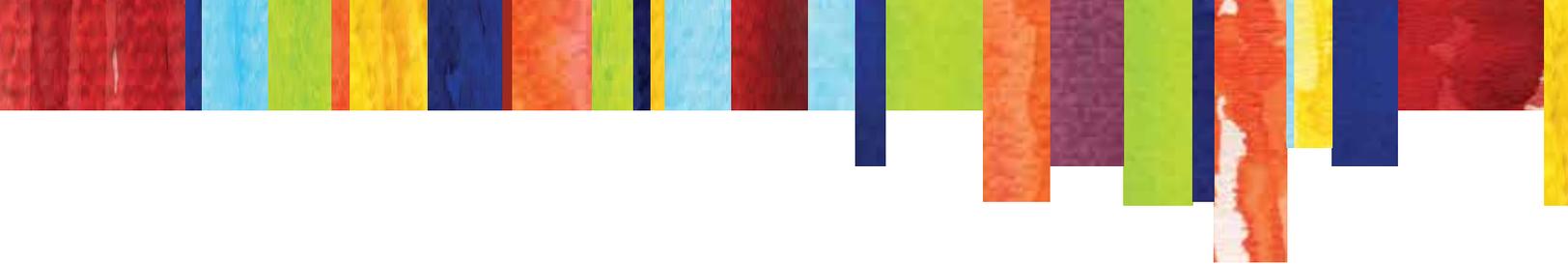


# 06. “He Left Me with Nothing at All:” Neglecting to Provide in Northern Alberta, 1914-1919

Area(s) of study: Social Sciences & Humanities

**Gwendolyn Bracken** | AUGUSTANA CAMPUS

In a time when divorces were not readily available and rarely sought, Canadian women could resort to Section 242 of the Criminal Code of Canada, ‘duty of head of family to provide necessaries,’ to seek legal aid in coercing support from their husbands. Very little scholarly work exists on the offence of non-support or neglecting to provide. Gender studies scholar Annalee Lepp devoted a chapter of her dissertation on marriage breakdown to neglect and non-support cases in Ontario (1830-1920). Mirroring Lepp’s approach, I analyze a corpus of 25 cases of non-support prosecuted in the Northern Alberta criminal jurisdiction between 1914 and 1919 found in the Provincial Archives of Alberta. I consider how magistrates enforced the laws of the period, how women and families used the courts as an avenue of justice, and how witnesses frame depositions. Similarly to Constance Backhouse’s research, I question how the legal system treated women. What do these cases reveal about marriage expectations and gender roles? How do the cases expose women’s experiences with the law?

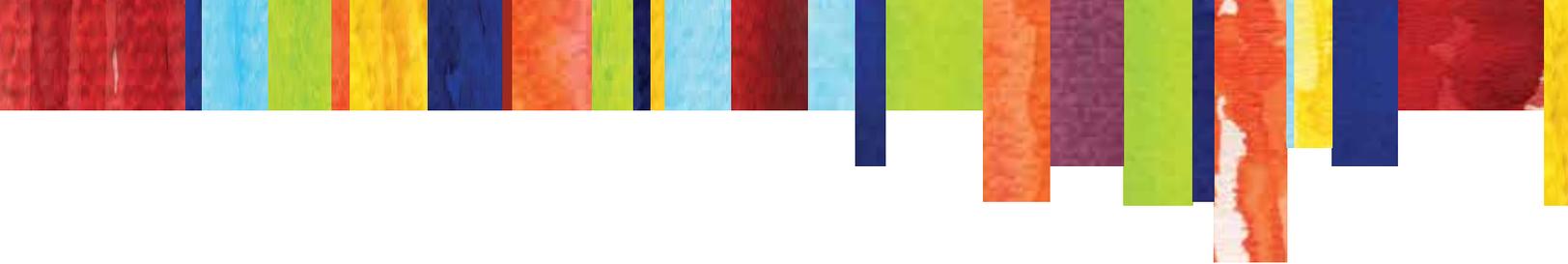


# 07. Cost-Benefit Analysis of Alberta's Carbon Levy: The First Four Years

Area(s) of study: Social Sciences & Humanities

**Emile Vogel-Nakamura\*, Dachang He** | AUGUSTANA CAMPUS

This paper performed a cost-benefit analysis on Alberta's newly-implemented carbon tax. Using Statistics Canada's Social Policy Simulation Data and Model (SPSD/M) and government estimates, cost and benefit values were discounted to assess the net present value of the levy over the next four years. While two other alternative policies were identified, they were not explored in this paper due to the lack of data available. One of those alternatives, carbon capturing, was dismissed on the grounds that it is not a forward-thinking approach to solving environmental issues. The other, cap-and-trade, could be a viable option although it faces higher implementation costs. It was found that the levy will provide net benefits of \$475 million dollars to Albertans over the first four years, and is thus a viable policy. The viability of the carbon levy, however, is highly dependent on the accuracy of the estimates provided. It is possible that the net present value of this policy will actually be negative, if costs have been underestimated or if emissions reductions have been overestimated. It follows logically that further analysis will be required at the end of the first four years to determine whether or not the levy should continue to be implemented in the future



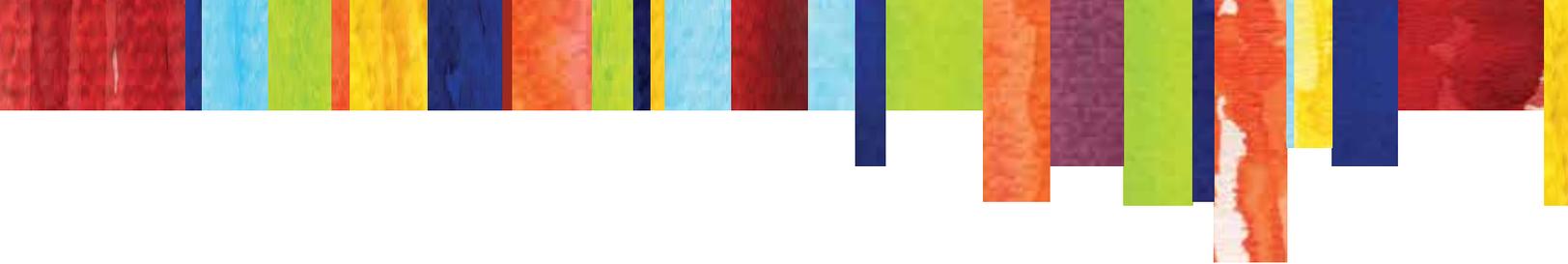
# 08. The Tasmanian tiger as a de-extinction candidate

Area(s) of study: Other/Interdisciplinary

**Susannah Mackenzie-Freeman** | FACULTY OF ARTS

De-extinction, the act of reviving extinct species, is something seemingly reserved for fictional movies, such as Jurassic Park. However, with advancements in genetic technology, de-extinction is becoming a reality. In 2016, the International Union for Conservation of Nature (IUCN) created a document titled, “Guiding Principles on Creating Proxies of Extinct Species for Conservation Benefit.” In it, the IUCN explores ethical and economic issues, costs and benefits, and guidelines, relevant to de-extinction.

In my presentation, I will use an extinct species as a case study for whether the IUCN document needs to be revised. The Tasmanian tiger, or thylacine, was hunted to extinction in the early 1900s. Since it became extinct so recently, reviving it is a possibility. One relevant ethical issue concerns justice: it is wrong that the thylacine was hunted to extinction, so we should investigate actions that can repair such wrongs. A difficulty that arises is that only living individuals can be subjects of moral duties, since the dead cannot be harmed. However, I will examine how we have duties to living beings that are harmed by the thylacine’s absence. In turn, I will provide an ecological restorationist argument, which is as follows. Tasmanian ecosystems have been imbalanced since the thylacine’s extinction, and upon its re-introduction they will be restored. Therefore, it is a good idea to revive the thylacine. Overall, by examining thylacines in relation to the IUCN document, I will thereby examine the costs, benefits, and economic and ethical issues that are relevant to de-extinction.



# 09. Hempact: An Innovative Solution to Sanitary Pads

Area(s) of study: Natural Sciences & Engineering

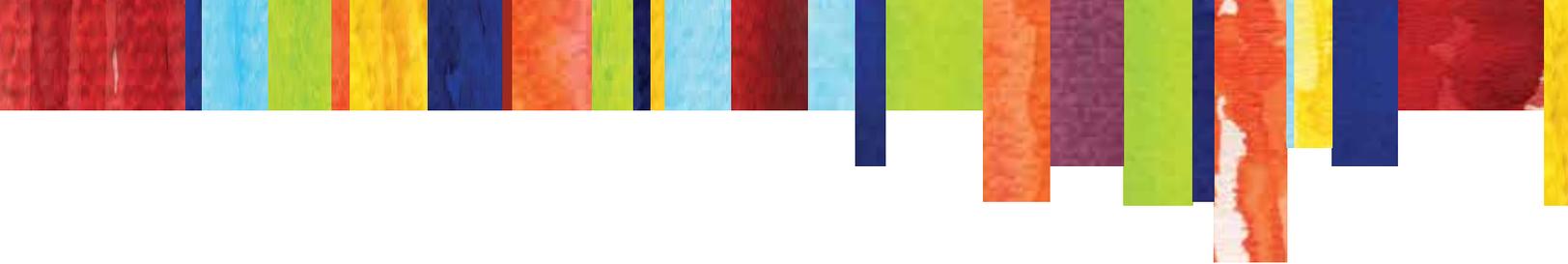
**Nikki Chau, Jason Leung\*, Jenny Li\*** | ALBERTA SCHOOL OF BUSINESS

Did you know that the average woman menstruates for 38 years —during which 35 pounds of plastic waste is created through the use of existing menstrual products. Meanwhile, in rural Alberta, over 20,000 acres of hemp parts are considered agricultural waste due to their lack of THC, the desirable chemical extract from their marijuana counterpart.

Hempact is a student-led, social entrepreneurship project partnered with Enactus UAlberta which started up in Summer 2017. It aims to limit the production of agricultural and menstrual waste by providing an eco-friendly solution through the replacement of commonly used cotton material with hemp fibre in sanitary pads. The hemp material has been known for its biodegradable nature and absorbency along with being three times more durable than cotton making it an ideal substitute in creating an environmentally sustainable sanitary pad.

In order to assess the feasibility of using hemp fibre as the main component of the pads, our group has conducted over 15 experiments from testing the various properties of hemp material to creating the components necessary to assemble the layers into its final product. Further research and testing will be required in the near future with hopes of creating a fully functioning prototype by Spring 2018.

Overall, this oral presentation aims to provide an overview of the experiments conducted over the course of this school year and highlight its successes and failures which acted as the foundation towards creating a well performing sanitary pad to be released into the marketplace.

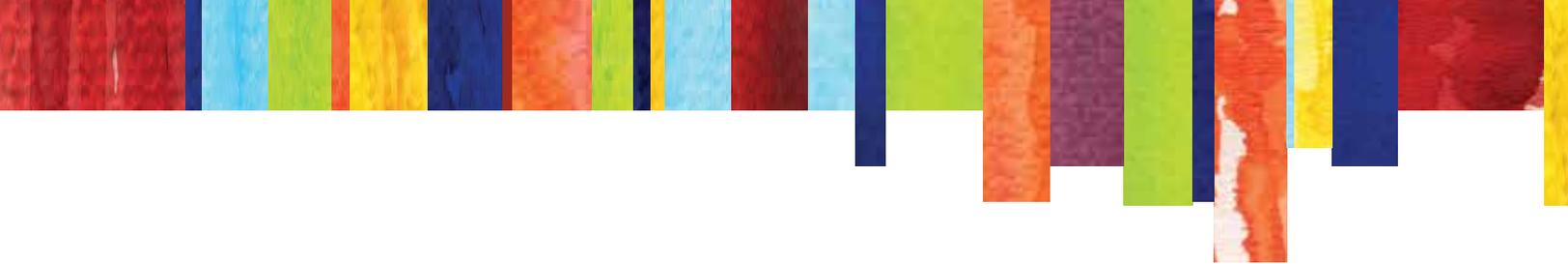


# 010. Understanding literature on the Digital Divide: Global perspectives and Local Approaches

Area(s) of study: Social Sciences & Humanities, Other/Interdisciplinary

**April Heinrich, Dr. Lars Hallstrom,  
Madison Pearson\*** | AUGUSTANA CAMPUS

I work for the Alberta Center for Sustainable Rural Communities (ACSRC) under Dr. Lars Hallstrom. I am a research assistant on a SSHRC Knowledge Synthesis grant regarding access to the Internet in rural areas. This review of the literature on the topic of rural Internet (which is also referred to as rural broadband) looks specifically at the ways that the government can encourage people to access the Internet. In our study, we have found that while much of the literature focuses on how to encourage institutions to offer broadband, very little of the literature focuses on how to make broadband cost- and capacity-efficient for residents. This project examines over 400 articles, both in grey and academic literature, to better understand not only how rural communities might increase the use of broadband, but also the effects of different broadband strategies on community development and sustainability. We have learned that there is much potential for broadband programming that includes digital literacy and education. This is because for people to make broadband a priority in their lives, they must understand how to utilize broadband and the benefit that broadband can have in their lives. We have also learned that the traditionally economic-based approach to encouraging broadband uptake and availability limits understanding of the problems of broadband, in addition to limiting possibilities for innovative solutions. This research finds the gaps in academic and policy-based understanding of broadband uptake and availability, leaving room for innovative perspectives and solutions to problems with broadband use.

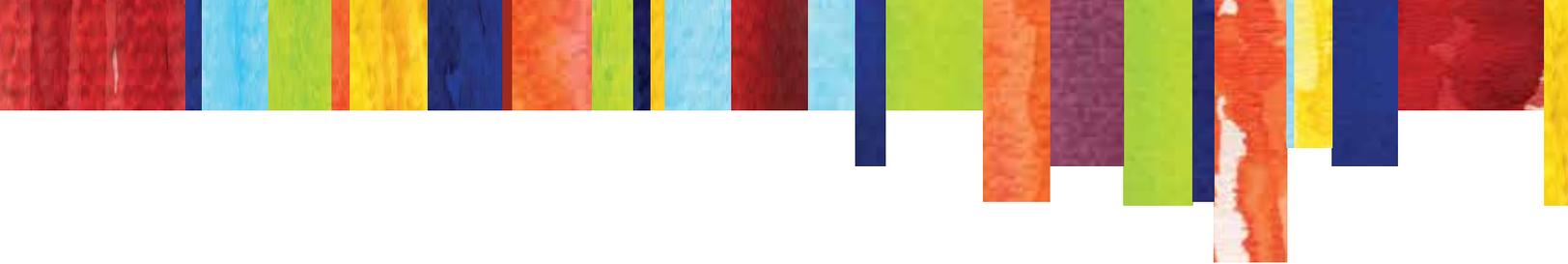


# 011. What Can Nurses Learn from Those with a Diagnosis of Schizophrenia?

Area(s) of study: Health Sciences

**Nicole Inglis** | FACULTY OF NURSING

Schizophrenia is a severe and complex mental illness that is treatable. Although schizophrenia is treatable, the priorities for care sometimes differ between people with a diagnosis of schizophrenia and their health care providers. Additionally, people with schizophrenia often report that they are marginalized in health care as well as society. Current research rarely seeks to understand the experience of young adults with schizophrenia and their recovery, and often only focuses on singular aspects of the disease. Drawing on literature, statistical reports, and world health organization definitions, this proposal lays the groundwork for how the experience of young adults with schizophrenia who are in recovery will be explored, and the ways in which this can be considered when planning holistic interventions and care. The introduction defines the relevant concepts to this research proposal and its connection to nursing care, which is followed by a literature review that explores the current understanding of the experience of people with schizophrenia and recovery. Through the use of a phenomenology approach and qualitative research methods, young adults with a diagnosis of schizophrenia will be explored.



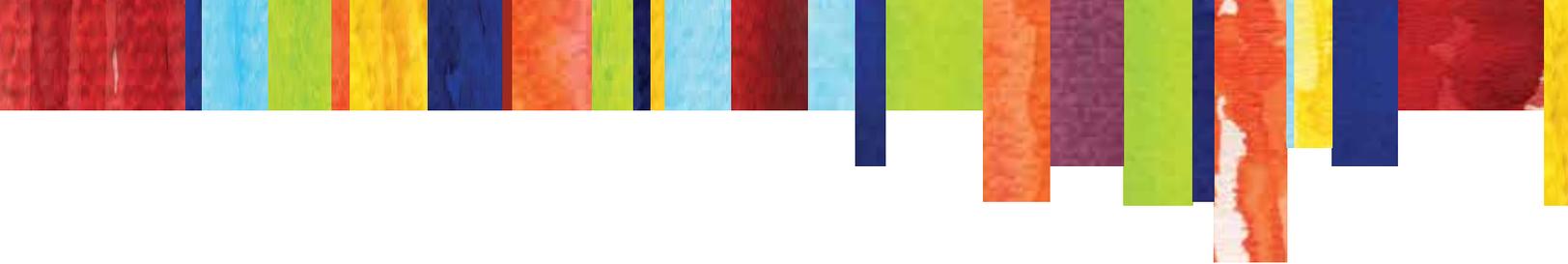
# 012. This is your brain on neoliberalism: ideology as pathology

Area(s) of study: Social Sciences & Humanities

**Feodor Poukhovski-Sheremetyev, BA Candidate (2019)**

CAMPUS SAINT-JEAN

While the “biopsychosocial” approach has become increasingly ubiquitous in clinical psychology, the “social” aspect of this model rarely looks beyond immediate circumstances such as income and family situation. Conversely, the sociological field has spent well over a century examining how large-scale social factors can affect the psychology of the individual. This presentation seeks to marry these two lenses by examining how neoliberalism, the dominant socioeconomic ideology of our time, can have a profound negative effect on mental health. With current and future clinicians in mind, a brief introduction to the isolating tenets of neoliberalism will be followed by an examination of how this ideology produces distinct psychopathologies and damages the mental healthcare system itself. Developing an awareness of the ideology we live under and how it affects practice is critical for any clinician hoping to apply the biopsychosocial approach with greater efficacy and nuance.



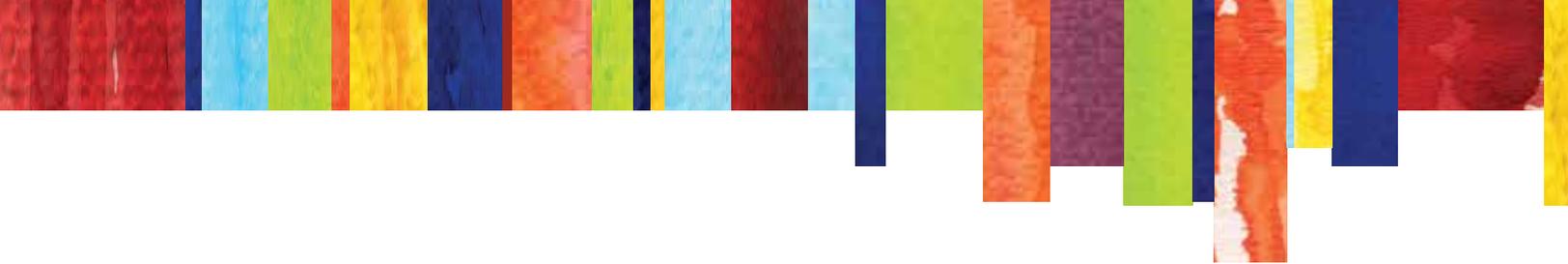
# 013. Diversity on the Board of Directors

Area(s) of study: Other/Interdisciplinary

**Dylan Kaseram\*** | ALBERTA SCHOOL OF BUSINESS

This current study focuses on the diversity of members on the board of directors. There exist many forms of diversity that affect firm financial and accounting performance as well as organizational behavior of board members. Furthermore, director heterogeneity could have both positive and negative effects on corporate boards. Nowadays, gender diversity is becoming increasingly important in a financial and management context. In the interest of promoting gender diversity, many governments around the world have enacted legislation requiring that state-owned and public companies respect pre-established quotas of women on their board of directors. Other countries have opted for an informal system in which state-owned and public companies must justify the absence of women on the board of directors. Even though there is still room for improvement, firms are taking steps toward fostering more diverse corporate boards. I execute an empirical analysis that examines director heterogeneity's influence on the market value of U.S. firms. My results indicate that diversity's positive effects are primarily driven by age. In conclusion, it is fair to say that the outlook for diversity on corporate boards seems to be positive.

Keywords: diversity, board of directors, gender, firm performance, organizational behavior



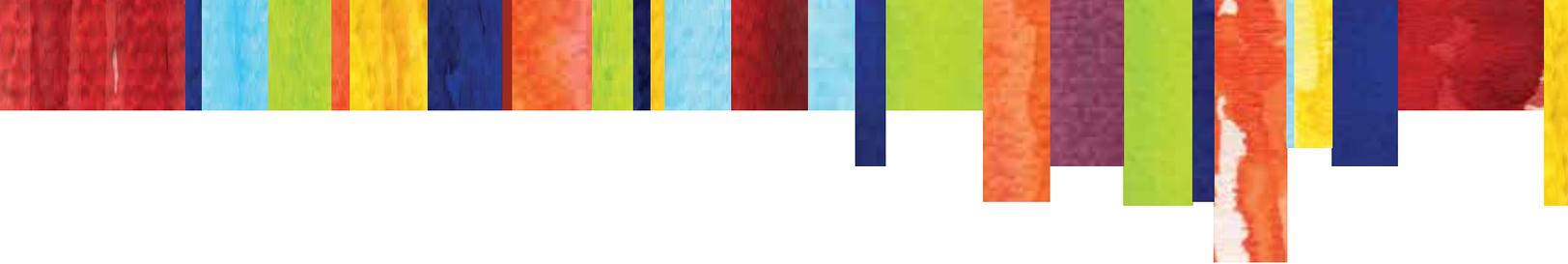
# 014. Decolonizing the Classroom: Incorporating Land-Based Pedagogy in Canadian Universities

Area(s) of study: Other/Interdisciplinary

**Leah Hrycun** | FACULTY OF NATIVE STUDIES

In recognizing that current education systems have contributed to the broken relationship between Indigenous peoples and settlers, it is the responsibility of educational institutions to mend those broken relationships. Michi Saagiig Nishnaabeg scholar, Leanne Betasamosake Simpson, has written extensively on the effects of current educational systems and argues that a return to land-based education would work toward decolonizing education. Indigenous knowledge and ways of knowing are integral to the education system and one way of incorporating these is through a return to land-based pedagogies (Simpson 2014). What, if anything, can be gained in moving students from the classroom to the land? How effective are land-based pedagogies to Indigenous and non-Indigenous students and what purpose do they serve? If they are effective, how can educational institutions incorporate land-based pedagogies into their curriculums?

My research includes a survey of Canadian Universities to determine the value on land-based pedagogies and whether or not land-based learning was forming a part of the current curriculum. While much can be learned from any educational institution in Canada engaging in land-based learning, this project surveys only recognized Universities in Canada which are engaging in land-based pedagogy in both for credit and not for credit capacities. In response to the Truth and Reconciliation Commissions' Calls to Action, Universities are expanding their research to include Indigenous ways of knowing and scholars are exploring different ways in which land-based learning can be incorporated into curriculum in the future.



# 015. Real brains in virtual environments: An investigation of attention in depth using a novel depth P3 task

Area(s) of study: Natural Sciences & Engineering

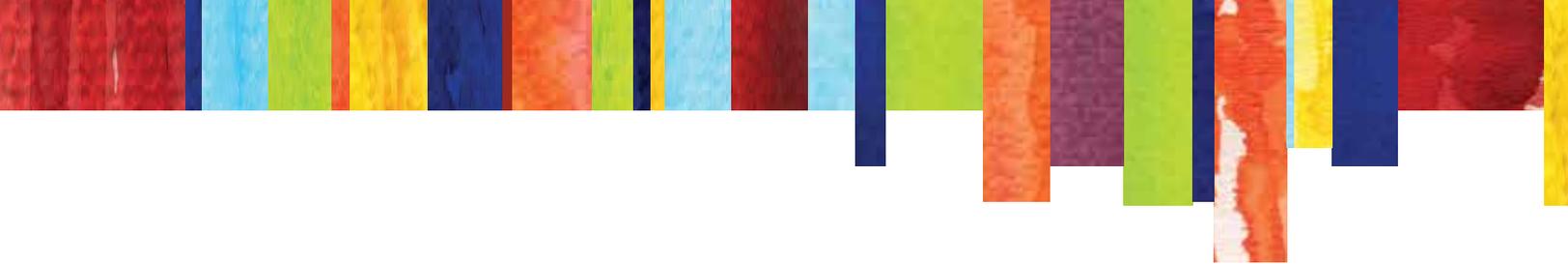
**Eden X. Redman\*, Jonathan W. P. Kuziek, Abdel R. Tayem,  
Jeff Murray, Jenna Reinen, Aldis Sipolins, Kyle E. Mathewson**

FACULTY OF SCIENCE

Electroencephalography (EEG) research is typically conducted in a highly controlled laboratory setting. However, this often limits the generalizability of results to real-world situations. Contemporary research has shown that alternative means of stimulus presentation can yield results comparable to traditional EEG methods.

Currently, we are exploring the use of virtual reality for presenting stimuli within an EEG study. This may serve to characterize brain states in novel or otherwise inaccessible research environments. In the present study we used an HTC Vive head mounted display (HMD) within a Faraday chamber to assess brain states during a novel depth-based P3. For this task, stationary participants responded to either near or far (size-matched) target orbs within a virtual environment. Standard orbs were presented 80% of the time and target orbs only 20%. Typical oddball task EEG waveforms such as the MMN and P3, negative and positive deflections respectively, were elicited following target orb presentation. Additionally, horizontal electrooculography (EOG), fitted to measure eye convergence and divergence, was shown to be related to orb depth.

Further research will differentiate how neural activity is modulated by objects presented at varying depths. Additionally, it may also be possible to use informative cues to promote attention at specific depths. Current results suggest that virtual reality can serve as a valid means of stimulus presentation in novel or otherwise inaccessible environments for EEG experimentation.

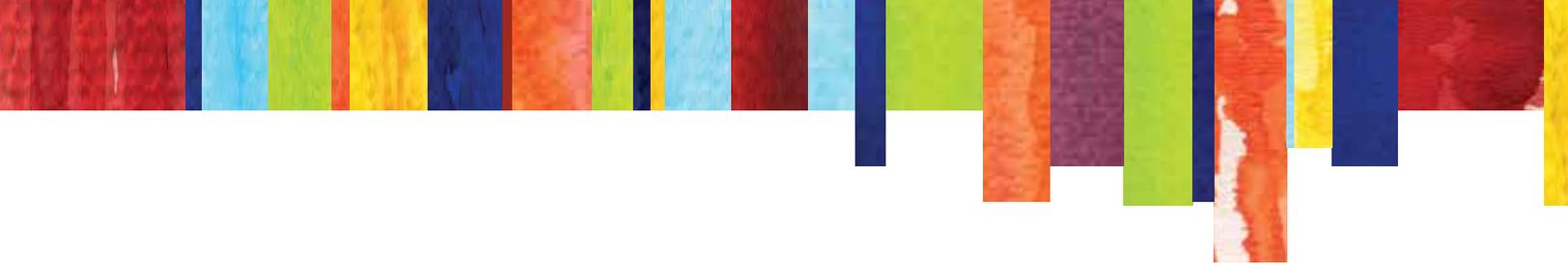


# 016. A Dual Role for TNF-alpha and S1P in Vascular Arterial Tone Regulation and Endothelial Function in Placental Arteries during Pregnancy

Area(s) of study: Health Sciences

**Kesia Dias\*, Denise G. Hemmings** | FACULTY OF MEDICINE & DENTISTRY

Preeclampsia is a disorder characterized by the onset of high blood pressure with proteinuria after 20 weeks of pregnancy. Inflammation in the placenta likely increases vasoconstriction in placental arteries. The decrease of blood flow results in decreased oxygenation, nutrients, ions, water and waste exchange to the fetus. We found that a bioactive lipid called sphingosine 1-phosphate (S1P), is an important regulator of constriction and dilation. A greater overall constriction effect by S1P is dependent on whether S1P binds to S1P receptors located on the outer smooth muscle cells of the arteries or the inner endothelial cells. Tumour necrosis factor-alpha (TNF- $\alpha$ ) is a major cytokine induced during inflammation that may have an indirect effect on constriction by activating the S1P pathway. S1P and TNF- $\alpha$  have each been linked to preeclampsia; however, the association between the two and their contribution to preeclampsia is unknown. Human arteries from normal placentas were dissected, mounted between two glass cannulas and pressurized on a pressure myograph system to simulate physiological conditions. S1P, TNF- $\alpha$  and/or inhibitors were infused inside the arteries or added to the bath and the resulting vessel diameters were recorded. We show that infused TNF- $\alpha$  stimulates constriction but only when the potent dilator, nitric oxide, is inhibited. We also demonstrated that S1P induces dilation through nitric oxide. Interestingly, TNF- $\alpha$  in normal placentas may in fact cause dilation, rather than constriction, by producing S1P, a process we are now investigating. Understanding these pathways will help us target malfunctioning biochemical pathways to treat patients with preeclampsia.



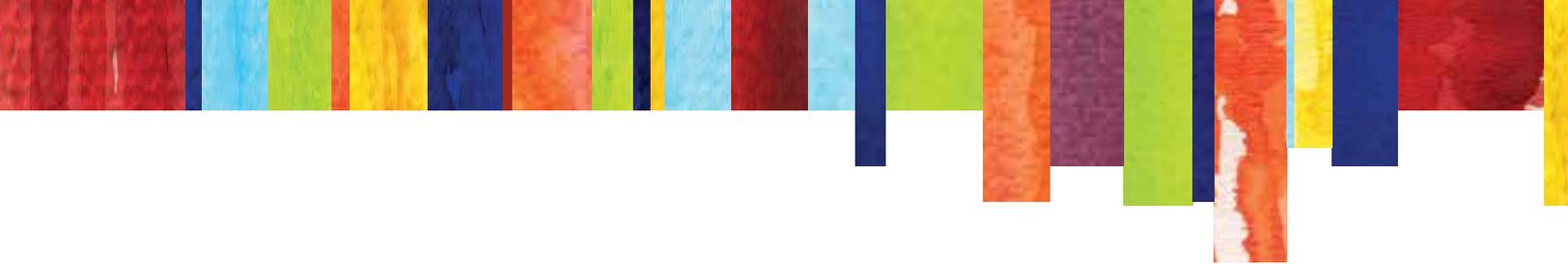
# 017. Severe Asthma: an Allergic Disease with an Autoimmune Background?

Area(s) of study: Health Sciences

**Sarah Almas\*, Lindsey Felix, Manali Mukherjee, Sruthi R. Thomas, Svetlana Davydchenko, Hui F. Lim, Melanie Kjarsgaard, Katherine Radford, Diane Robins, Nader Khalidi, Parameswaran Nair, Paige Lacy**

FACULTY OF SCIENCE

Asthma is an inflammatory disease caused by lung recruitment and activation of white blood cells including eosinophils, and ~50% of asthmatics have elevated blood and tissue levels of eosinophils. Eosinophils are highly granulated and generate proteins including eosinophil peroxidase (EPX), which can provoke an immune response. An autoimmune disease known as eGPA (eosinophilic granulomatosis with polyangiitis) exhibits a clinical resemblance to severe asthma. In autoimmune diseases, the body attacks its own tissues such as by creating antibodies against its own proteins (autoantibodies). We hypothesize that autoantibodies to eosinophilic components are generated in patients with severe asthma. To test this, airway sputum (mucus) and serum from blood samples were collected from patients with asthma ( $n = 4$ ), eGPA ( $n = 6$ ), and healthy controls ( $n = 4$ ). Human eosinophils were purified from a separate individual, then adhered to glass coverslips before fixation. Sputum and serum autoantibodies (immunoglobulin G, IgG) samples were incubated with fixed eosinophils, and fluorescent dyes were used to detect binding by sputum and serum autoantibodies. Cells were imaged using super resolution microscopy. Sputum antibodies from asthmatics had increased binding to eosinophilic cellular components compared to healthy samples, indicated by punctate cytoplasmic staining ( $p < 0.05$ ). There was increased sputum IgGs colocalization with EPX in asthmatics compared with healthy samples, followed by eGPA patients, when comparing individual cells ( $p < 0.001$ ). No significant difference between serum samples was observed. These findings suggest a novel 'autoimmune' endotype of severe asthma and highlight the need for improved therapeutic strategies in the management of disease.



# 018. Frat Boys' Revolution: How Fraternities Can Become Sites of Resistance

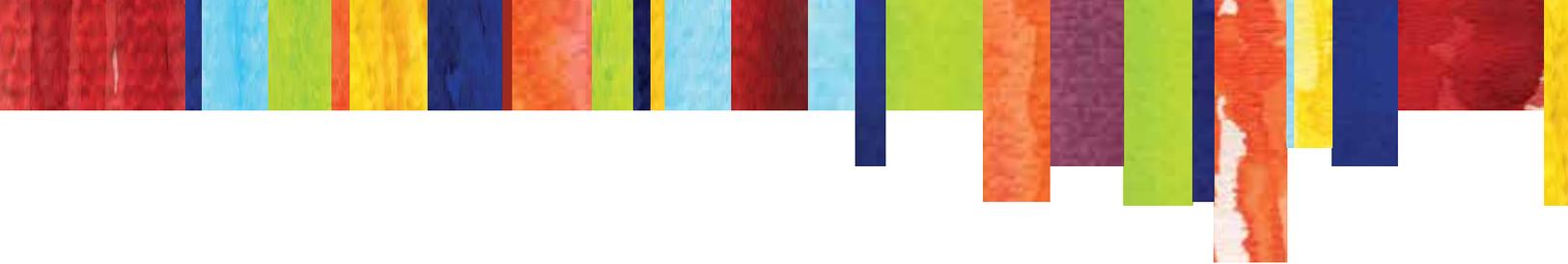
Area(s) of study: Social Sciences & Humanities

**John Evjen** | FACULTY OF ARTS

Fraternities have long been topics in the media around deviant performances of masculinity. Their roots patriarchal and heteronormative belief have led to the normalization of violence, in particular violence against women in their systems. Researchers have found that fraternity members are so high risk that it is an acceptable generalization to assume a non-member is far less likely to commit sexual assault than a fraternity member. Despite these findings in the literature, other academics suppose that there is ray of hope in fraternity culture based on the mechanisms that perpetuate the toxic masculinities within the fraternity.

The literature resoundingly shows that fraternities perpetuate negative behaviour because of the environment of the fraternity rather than the individual members. While fraternity environment is usually used to perpetuate sexist behaviour, fraternity environment can also be a vehicle for counter-hegemonic practices in an effort to reduce sexual assault on campus.

Using the examples of two fraternities at the University of Alberta, I seek to show how fraternities can become a site of resistance by initiating change from within. Delta Upsilon, a fraternity at the University of Alberta, uses the strategy of mandatory sexual assault prevention workshops as a method, where Kappa Sigma utilizes social media to debunk rape myths and claim responsibility for sexual violence. Both of these strategies are viable, but are they truly resisitive? This paper seeks to answer this question by interrogating their actions against the student affairs literature on fraternities as well as feminist literature on sexual assault.

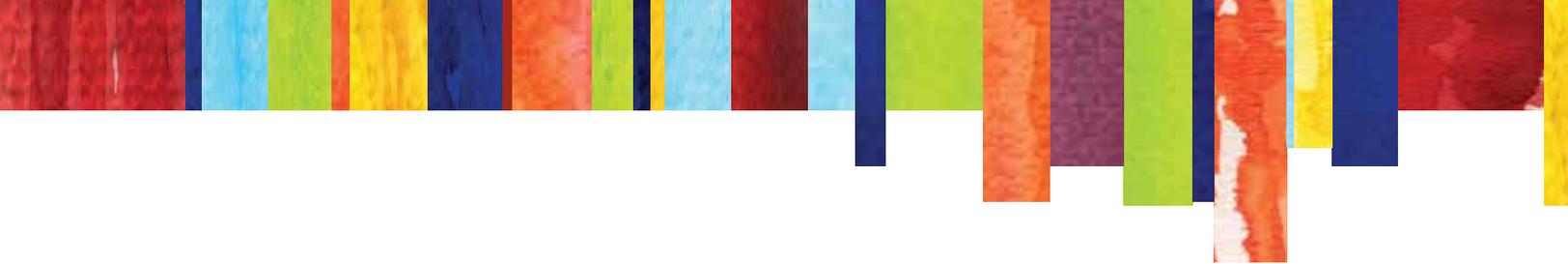


# 019. One Man Wolf Pack

Area(s) of study: Social Sciences & Humanities

**Alannah Piasecki** | FACULTY OF ARTS

On April 19, 1995, Timothy McVeigh and Terry Nichols blew up the Alfred P. Murrah Federal Building in Oklahoma with a homemade bomb; becoming known as the first “lone wolf” terrorists on U.S. soil. Since the events of 1995, it appears that this kind of violence, as opposed to that committed by organized groups, has become more frequent. The apparent rise of lone wolf attacks, particularly in the United States, suggests that it is becoming the predominant form of domestic terrorism (Michael 2012). Despite the rise in these “lone wolf” displays of violence, the academic understanding of the term and how it fits within contemporary understandings of terrorism remains vague. This vagueness brings forth an essential question: how has the development of leaderless resistance models in the United States changed the way we understand individual perpetrators, better known as “lone wolves”, in the context of domestic terrorism? By analyzing the historical background of leaderless resistance models (the model of social association that individual perpetrators of domestic violence fit in to), pinpointing the origins of the “lone wolf” actor, and utilizing case studies, I seek to better understand how we currently are, and ultimately ought to be, understanding individual violent actors as they relate to domestic terrorism.



# P1. A two year retrospective analysis: Why are our veterans falling?

Area(s) of study: Health Sciences

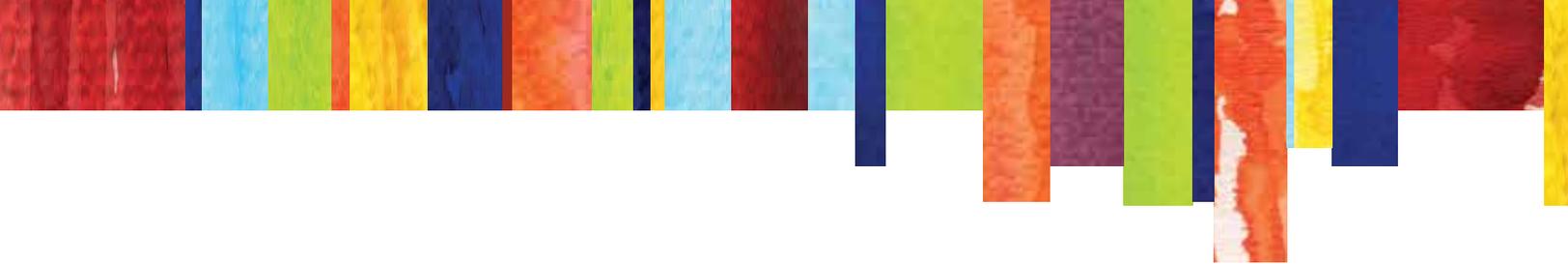
**Vivan Tran\*** | FACULTY OF SCIENCE

**Background:** Fall-related injuries are a major health concern in the growing older population. Approximately 5-10% of all falls results in either major injuries or death. The objectives of this study were 1) to provide staff at a long-term care (LTC) facility insight into the rates of falls at their facility and 2) guide future fall management strategies and interventions.

**Methods:** This study focuses on residents admitted to the LTC facility from October 1, 2014 to September 30, 2016. The final sample consisted of 158 residents. Data was collected retrospectively using incident reports, an electronic health records system, and resident charts. Some variables collected include: residents' length of stay, time of fall, location of fall, and injury type.

**Results:** 355 falls occurred during the study period. Approximately 10% of falls resulted in a head injury or a major injury. In addition, a large proportion of falls occur during shift changes, evening shifts, as well as in resident rooms and dining rooms. Surprisingly, 50% of falls occur during the first 75 days upon a resident's admission, allowing for targeted interventions in the future.

**Discussion:** Although the frequency of falls is high at this site, the proportion of falls with injury and falls without injury are consistent with previous research. Based on the results of this study, several factors can be targeted as parts of a new falls management strategy. Currently, this LTC site is focusing on the interventions during the admission process and strength training exercises to help prevent future falls.



# P2. Vibrational Analysis of Brain Cancer Cells Using Laser Trapping

Area(s) of study: Health Sciences

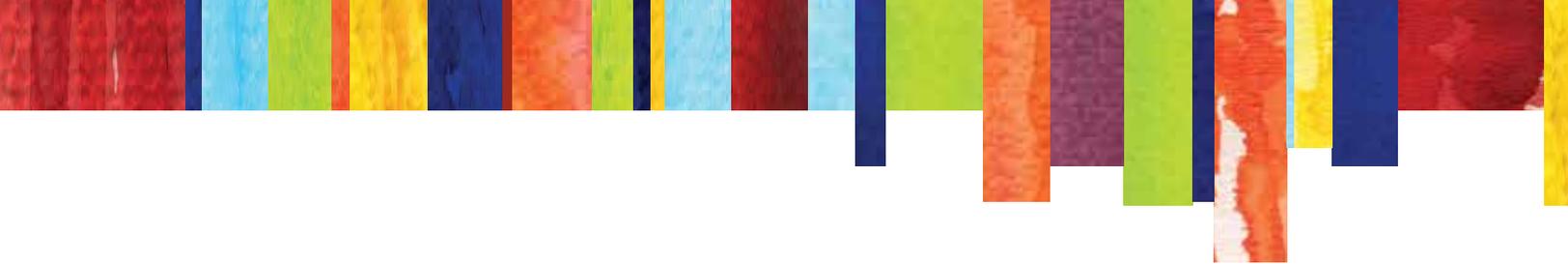
**Irene Shkolnikov\*, Jack Du, Jared Topham** | FACULTY OF SCIENCE

**Background:** With current neuroimaging and biopsy technologies, problems arise when differentiating heterogeneous tumors. This complicates diagnosis and delays treatments. To better differentiate tumor cells, we developed methodology of measuring cellular vibration using optical tweezer force microscopy. Vibrations reflect internal cellular mechanisms like metabolism and membrane fluidity and they can be measured. **Hypothesis:** Analysis of distinct cell vibrations is a method to distinguish between cells and cell types.

**Objective:** The primary objective of this experiment was to differentiate glioblastoma cell lines (BT53, BT48) from human fetal astrocytes (HFA) by analyzing vibrational profiles. **Methods:** Using optical tweezer microscopy, vibrational profiles of BT48, BT53, and HFA cells were recorded as force deflection over time signals. Data was analysed and compared based on Root Mean Square (RMS) propagation to measure magnitude of vibrational signal. Fast Fourier Transform (FFT) to distinguish unique vibrational frequencies.

**Results:** BT53 cells exhibited significantly higher RMS values than BT48 cells and HFA cells ( $p = 0.0001$  and  $0.001$ , respectively). While some vibrational frequencies were shared between all cells, select frequencies provided a fingerprint identification for specific cell types. Notably, at  $\sim 40500$  Hz, BT48 and BT53 shared a common peak, but was absent in HFA suggesting relation to tumor-specific activity. A peak at  $\sim 44500$  Hz presented in BT53 cells, not BT48, and may act as a marker between strains.

**Conclusions:** Evidence shows vibration peaks were cell/cell type specific. Hypothesis that cell types are identifiable by their vibration patterns was confirmed. This could lead to development of future clinical/diagnostic tools.



# P3. How Nurses Restore and Maintain Mobility in Hospitalized Older People: An Integrative Literature Review

Area(s) of study: Health Sciences

**Stephanie Constantin B.Sc\*, Dr. Sherry Dahlke PhD, RN, CGN(C)**

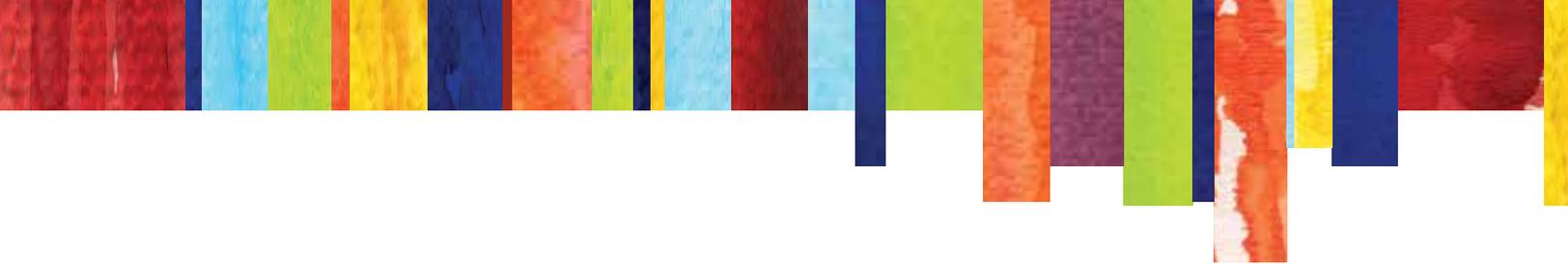
FACULTY OF NURSING

**Research Problem:** Older persons make up the majority of healthcare recipients and they are at risk to experience significant decline in their mobility once hospitalized. This can result in longer hospitalizations or nursing home admissions. Currently, it is not well understood how nurses maintain and restore mobility of hospitalized older persons. The purpose of this literature review was to evaluate and summarize current research about how nurses are maintaining and improving hospitalized older persons' mobility levels in acute care units.

**Methods:** An integrative literature review using key concepts related to hospitalized older people, mobility and nursing care was conducted. Two reviewers screened resources from computerized databases published in English during 1990-2017. Reviewers used the CASP and MMAT quality appraisal tools to assess included articles.

**Findings:** 13 articles are included in this integrative review (qualitative n= 6; quantitative-descriptive or non-randomized controlled study n=5; mixed-methods n=2). The literature focused on mobility as a routinely missed nursing task, which is a result of low confidence and knowledge in mobility exercises, and the assumption that mobility is the responsibility of physiotherapy. Successful units embodied the unit expectation to mobilize patients, and trained nurses to feel empowered in initiating mobility opportunities for their patients.

**Conclusion:** Nurses consider mobility assessments to be the responsibility of physiotherapy and are not confident in their abilities to safely ambulate patients. When units invest in educating and training nurses on mobility, supply mobility resources and adequate staffing levels, nurses were more likely to take ownership over their patient's mobility needs.

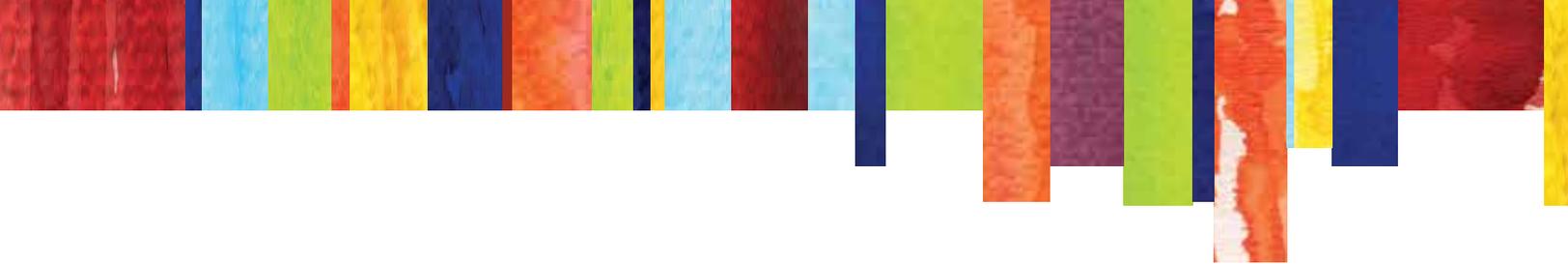


## P4. Complex Structural Studies of a Triple Negative Breast Cancer Target and its Activator

Area(s) of study: Health Sciences

**Jaslyn Rasmuson\*, Steffane McLennan, Jitendra Kumar, Rajesh Sundaresan, Michael Overduin** | FACULTY OF SCIENCE

According to the Canadian Cancer Society, 1 in 8 women will develop an invasive breast cancer throughout her life and an estimated 1 in 31 will die from it. While many subtypes of breast cancer can be effectively treated with chemotherapy, triple-negative breast cancer (TNBC) lacks the markers that these therapies target. This makes it particularly difficult to treat this aggressive subtype, and in advanced stages often only palliative care can be offered to patients. The CAMSEED Consortium has identified a Triple-Negative Target (TNT) for this disease: an enzyme that is overexpressed in 80% of TNBC tumors and leads to increased cell proliferation. They are designing small drug-type molecules to inhibit this protein, a therapy that could better treat patients with triple-negative breast cancer. The goal of this project is to understand the natural activation mechanism of TNT, which is crucial in developing this new and upcoming therapy. We hypothesize that the protein's activator binds to the Binding Domain of TNT to activate enzymatic activity.



## P5. Containment Products and Quality of Life in Men with Urinary Incontinence: An Exploratory, Mixed Methods Study

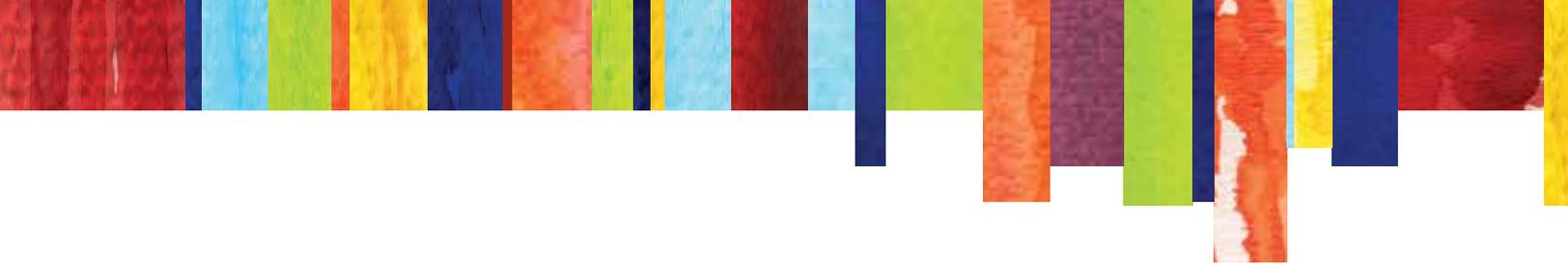
Area(s) of study: Health Sciences

**Cody Lindeman\*, Megan McCreary, Stephanie Gartner, Saima Rajabali , Ian Milsom, Kathleen Hunter, Adrian Wagg**

FACULTY OF SCIENCE

Urinary incontinence (UI) is estimated to affect one in ten men. Little is known about how pads affect quality of life (QoL).

This exploratory study assessed the feasibility of a formal trial of pad use and QoL in men, and provided insight into men's perception of UI and pads. Quasi-experimental, mixed methods study. Men,  $\geq 18$  years with UI and had never used pads were recruited by a wide advertising campaign. Individuals with faecal incontinence and cognitive impairment were excluded. QoL, demographic, incontinence-severity, and pad satisfaction questionnaires were administered at baseline and six weeks later. Participants were given a six-week supply of pads, and invited to participate in a semi-structured interview. Nine participants of mean age 69 (16) were included. Baseline mean(SD): ICILUTSQoL = 31.0 (5.5), EQ-5D= 83.3 (11.8); 6 weeks mean(SD): ICILUTSQoL = 33.3 (7.3), EQ-5D= 86.5 (9.4); Effect size, dz ICILUTSQoL = 0.35, EQ-5D= 0.29. Finding first-time pad users proved difficult, as pads are readily accessible in stores. Qualitative interviews revealed pad design and tight undergarments required to hold pads in place as challenges. Men viewed pads and male UI as a stigmatized and hidden subject, but found pads improved their confidence in public. Valuable information was provided from which a formal fully powered trial can be planned. Further recruitment is required to obtain a more robust estimate of effect size for changes in QoL prior to this. A greater understanding of the stigma surrounding male UI and pad usage, and some barriers men encounter when searching for solutions was obtained.



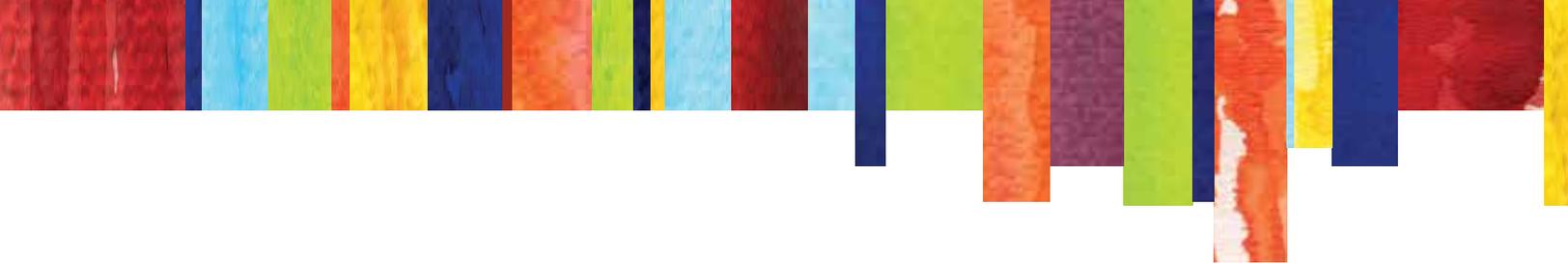
# P6. Hereditary Phospholamban Mutants Regulation of SERCA

Area(s) of study: Health Sciences

**Ivy Porter\*, Gareth Armanious and Dr. Howard Young**

FACULTY OF SCIENCE

Most known phospholamban mutations that cause dilated cardiomyopathy (DCM), alter regulation by phosphorylation. The sarcoplasmic reticulum calcium pump (SERCA) is a key component of cardiac muscle contraction-relaxation and phospholamban (PLN) reversibly regulates SERCA to fine tune cardiac output. Phosphorylation of PLN by protein kinase A (PKA) relieves inhibition. R14del and R9C PLN cannot be phosphorylated and are linked to lethal DCM. Y6D, I12T, I12V, A11V and L44P PLN were chosen for this project to investigate if the molecular mechanism by which mutations near the PKA recognition motif, (Arg13Arg14Ala15Ser16), alter PLN function or phosphorylation in a way that is distinct from the more severe PLN mutations (e.g. R9C). Molecular biology was utilized to generate mutant PLN, then mutant PLN was purified and reconstituted with SERCA into a membrane. A Ca-ATPase assay determined the ability of the mutants and phosphorylated mutants of PLN to inhibit SERCA. SERCA and wild-type PLN were run as controls. PKA assays measured PLN mutant's ability to be phosphorylated. I12T and L44P PLN mutants have normal regulation of SERCA. L44P was predicted to be loss of function due to similarity with the hypertrophic cardiomyopathy (HCM) associated Leu39X mutant. Further structural analysis of L44P is required. Y6D, I12V and L44P phosphorylated at a faster rate than wild-type PLN and are candidates for further study of disease potential. I12T did not phosphorylate, thus SERCA regulation could not be reversed. Phosphorylation of wild-type PLN and L44P relieved SERCA inhibition. I12T PLN did not phosphorylate, this may result in chronic SERCA inhibition.



# P7. The Role of Hypoxia Inducible Transcription Factors in Renal Cell Carcinoma Angiogenesis

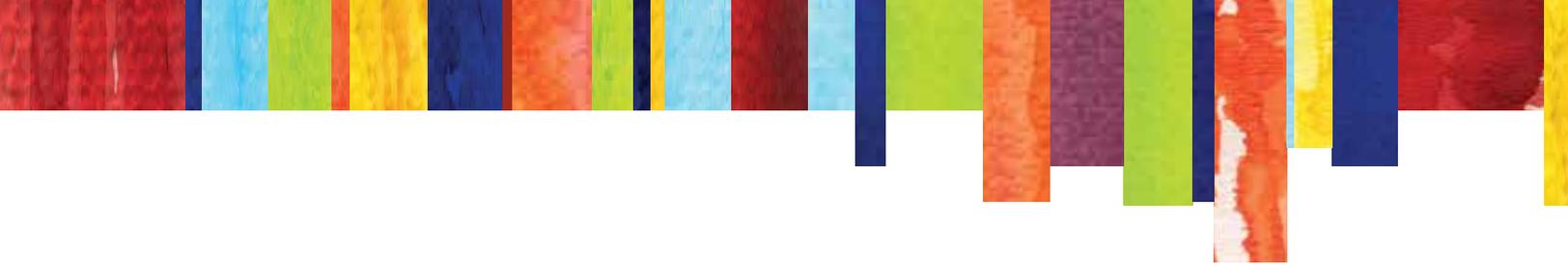
Area(s) of study: Health Sciences

**JoAnn Thai\*, Hua Chen, Abul Azad, Ron Moore**

FACULTY OF SCIENCE

Clear cell renal cell carcinoma (ccRCC) is often characterized by a mutation in the von Hippel-Lindau (VHL) gene, which is associated with the activation of hypoxia-induced transcription factors (HIFs) such as HIF2 $\alpha$ . These transcription factors activate pro-tumorigenic target genes that eventually lead to angiogenesis and survival pathways for the cell. Angiogenesis is the process by which blood vessels emerge from pre-existing blood vessels in normal physiological conditions. In phases of rapid tumour growth, cancer cells release growth factors to encourage endothelial cells to grow and differentiate to aid in the growth of the tumour, thus leading to blood vessel formation. Autophagy has been identified to be one of the mechanisms through which HIF2 $\alpha$  is degraded.

In this study, we investigated the role of HIF2 $\alpha$  in ccRCC angiogenesis and the behaviour of these transcription factors within the cell. We used an angiogenesis fibrin bead assay to observe that growth factors released by cancer cells promote angiogenesis in human umbilical vein endothelial (HUVEC) cells. Using western blots and cell cytotoxicity assays in ccRCC cells both with and without a VHL mutation, we compared the presence of HIF2 $\alpha$  in ccRCC cells. We found that cells treated with autophagy inhibitor bafilomycin A1 had increased levels of HIF2 $\alpha$  and survived better compared to cells re-expressed with VHL. These results indicate that HIF proteins like HIF2 $\alpha$  are a possible therapeutic target for kidney cancer. Although the mechanism of action remains to be established, these HIFs offer a possible route to treat unwanted angiogenesis within a tumour.



## P8. Zika virus infection in oligodendrocytes and its effect on myelin synthesis.

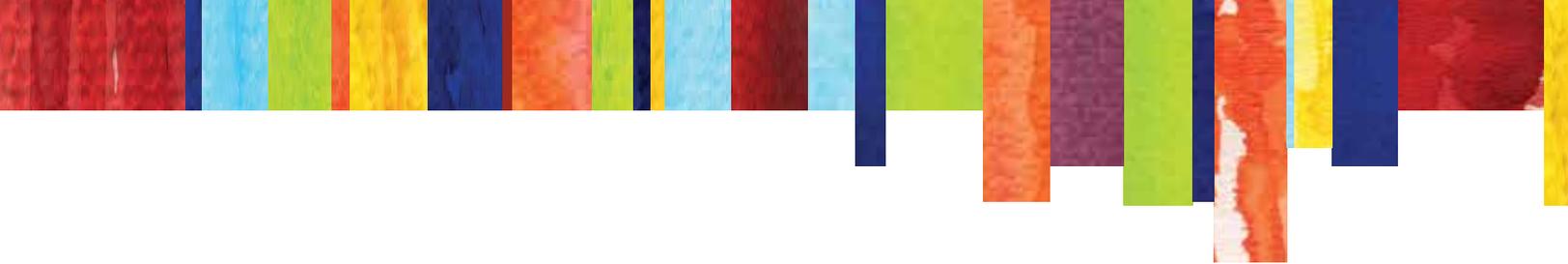
Area(s) of study: Health Sciences

**Julia Lu\*, Daniel Limonta, and Tom Hobman**

FACULTY OF SCIENCE

Zika virus (ZIKV) is an emerging pathogen that caused worldwide alarm in 2016 during the outbreak in Brazil. ZIKV infections were linked to serious birth defects in developing fetuses including microcephaly as well as Guillain-Barré syndrome (GBS) in adults. In many cases, the manifestation of GBS follows viral or bacterial infections and is characterized by demyelination of peripheral nerves. The onset of GBS results in muscle weakness throughout the body and can lead to paralysis.

In this study, we are investigating whether oligodendrocytes (ODCs) are susceptible to ZIKV infections and whether the virus can disrupt the myelination process. ODCs are also found within the central nervous system and are responsible for producing myelin, a fatty white substance critical for electrical insulation of neurons. If ODCs are affected by ZIKV, then this may be another mechanism by which the virus causes damage to the fetal brain following in utero infection. An ODC-hybrid cell line (MO3.13) is being used for this study. MO3.13 cells can synthesize proteins important for myelin formation including myelin basic protein (MBP), myelin protein zero (MPZ), and UDP-glycosyltransferase-8 (UGT8). Data obtained from our studies show that ODCs are highly permissive to ZIKV infection. Moreover, qRT-PCR and confocal microscopy suggest that UGT8 and MPZ levels in ODCs are dysregulated by ZIKV infection. Further studies to elucidate how ZIKV affects other aspects of the myelination process are ongoing.

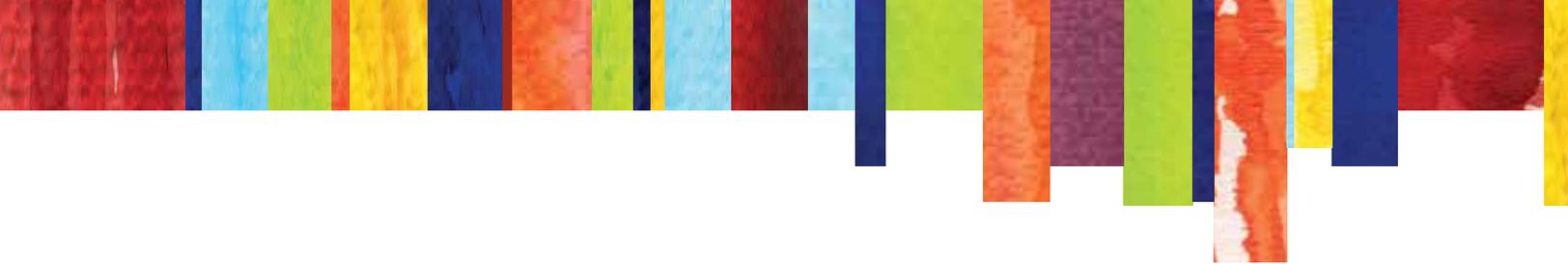


## P9. Exploring the Feasibility of Remote Delivery of an Exercise Program in Patients With Postural Orthostatic Tachycardia Syndrome (Pots)

Area(s) of study: Health Sciences

**Mirna Matta\*, Eric Mathieu, Meghan Linsdell,  
Dr. Lawrence Richer** | FACULTY OF SCIENCE

Postural tachycardia syndrome (POTS) is a condition characterized by an inability to stand for long periods due to excessive tachycardia causing dizziness and generalized weakness. Exercise has shown to be an effective intervention based on limited adult studies, however these interventions require large time commitments and expensive equipment – yielding poor adherence. This study's goal was to investigate the feasibility and tolerability of an exercise program comprised of short duration - high intensity circuits, no equipment requirement, and personalized to the participants' symptoms. Feasibility and tolerability were primarily defined as participant ability to complete and willingness to continue the program. Participants (n=9), aged 13-18 years and diagnosed with POTS, completed surveys to evaluate their symptom burden and beliefs about exercise before and after the 28-day exercise program. Adherence was tracked via daily exercise logs while functional outcomes were measured via a 6-minute exercise circuit videotaped at home. In a post-study debriefing session, participants evaluated the quality of the program. Ultimately, 6 participants completed the program, resulting in a completion rate of 67% compared to the 41% of previous adult exercise studies. Additionally, 85% indicated a desire to continue the exercises with their regular activities and 100% were able to modify and perform the exercises at home. However, video monitoring was difficult due to issues with uploading videos and not wanting to be filmed. Overall, the results demonstrate that the exercise program is and well tolerated by participants; however, future intervention studies need to explore other methods of remotely monitoring performance.



# P10. Effect of Pad Use on Quality of Life in Women with Urinary Incontinence

Area(s) of study: Health Sciences

**Megan McCreary\*, Saima Rajabali, Kathleen Hunter,  
Ian Milsom, Adrian Wagg** | FACULTY OF SCIENCE

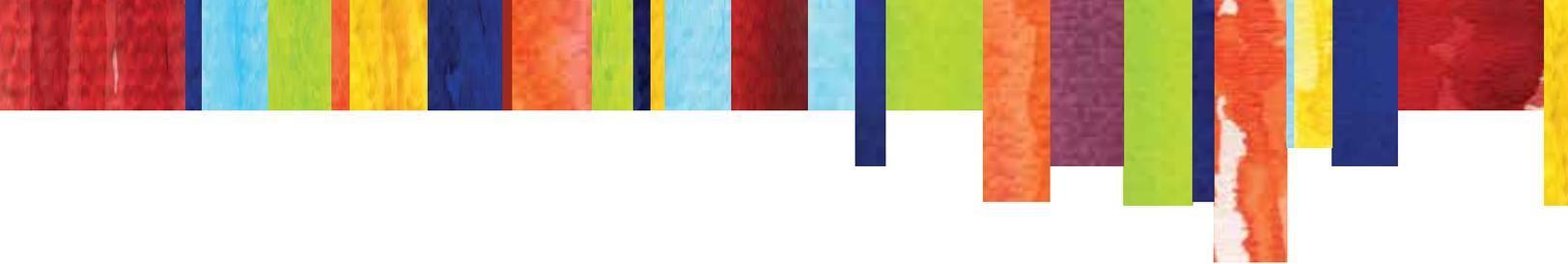
Urinary incontinence (UI) is a common condition affecting 10-44% of adult women. Many delay seeking healthcare or do not seek it at all and instead rely on pads to manage their incontinence. Despite their wide usage, little is known about how pad use affects quality of life (QoL). This study aimed to investigate the effect of pad use on QoL in women naïve to incontinence product use. This quasi-experimental, mixed methods study consisted of a quantitative assessment of QoL followed by a qualitative phase of semi-structured interviews. Participants were recruited using print and digital media. Women  $\geq 18$  years with UI and had never used pads were included. Women with faecal incontinence and cognitive impairment were excluded. Questionnaires on demographics, UI severity, and QoL were administered at baseline and 6 weeks later. Women received a 6 week supply of pads.

Preliminary analysis was conducted on 18 women. The mean (SD) age was 61 (17.2) years and had moderate UI (mean (SD) Sandvik severity score 4.8 (2.1)).

	<b>Baseline</b> mean (SD)	<b>6 Weeks</b>
ICI LUTSQoL ( - = better)	35.6 (7.5)	34.7 (11.6)
EQ-5D ( + = better)	8.6 (9.4)	80.7 (10.8)

Finding first-time pad users proved difficult. Qualitative data suggested a feeling of security when wearing pads was common. Some felt their reduced anxiety allowed them more time to focus on the task at hand. Despite these described benefits, cost of pads was still an important factor.

Further recruitment is ongoing to assess the significance of the effect of pad use on women's QoL.

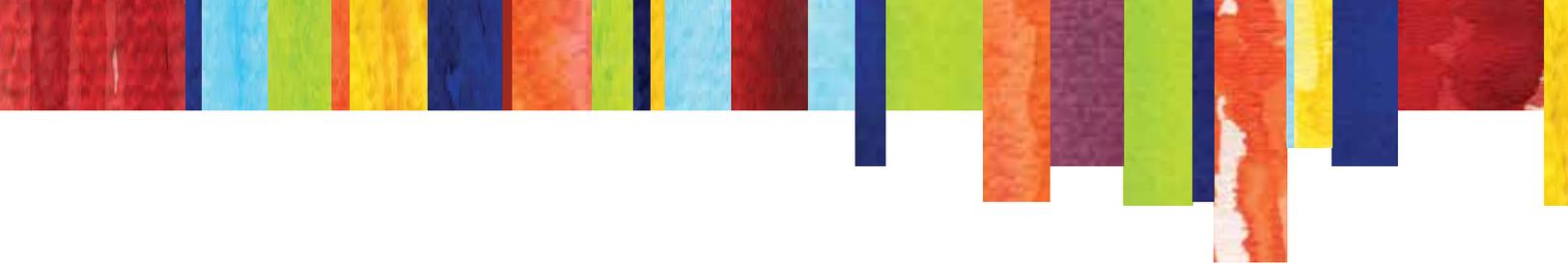


# P11. Fecal Microbiome Transplants From Resveratrol-Fed Mice Improves Glucose Homeostasis in Obese Mice

Area(s) of study: Health Sciences

**Abrar Alam\***, Ty T. Kim, Miranda M. Sung, Emmanuel Denou, Carrie-Lynn M. Soltys, Nikole J. Byrne, Grant Masson, Heekuk Park, David S. Wishart, Karen L. Madsen, Jonathan D. Schertzer and, Jason R. B. Dyck | FACULTY OF SCIENCE

Obesity and type 2 diabetes (T2D) are global epidemics and the number of individuals affected by T2D is rising. Resveratrol (resv), a polyphenolic compound found in certain plant-based foods, has shown promising results in the prevention and treatment of T2D. While oral administration of resv can improve glucose homeostasis in obese individuals, the majority of ingested resv will pass unmetabolized to the colon because of its low bioavailability. In fact, the interaction of resv with the gut microbiota may be a major mechanism by which resv improves glucose homeostasis in obesity. Based on this, our hypothesis is that fecal microbiome transplants (FMT) from healthy resv-fed mice is sufficient to improve glucose homeostasis in obese mice. Conventional raised 8 week-old C57Bl/6 mice were maintained on a high-fat high-sucrose diet for 6 weeks to induce impaired glucose homeostasis. Fecal matter was then transplanted from donor mice maintained on either a control diet (Chow) or a Chow + 0.4% resv diet for 8 weeks to obese mice. Additionally, to confirm that live bacteria are required for the beneficial effects of FMT, the same experiment was repeated with heat-killed fecal slurry. While ingestion of resv for 2 weeks is not sufficient to rescue impaired glucose tolerance in obese mice, obese mice receiving resv-FMT show improved glucose tolerance and peripheral insulin signaling within 11 days of the first transplant. FMT using heat-killed resv slurry also show similar improvements. These findings demonstrate that FMT from resv-fed mice is more potent than an oral treatment of resv, and highlight the potential importance of non-living bacterial, metabolites or other components of the fecal material as a central mechanism by which resv improves glucose homeostasis in obesity.



# P12. Construction of DNA Motors Using Streptavidin-coated Gold Nanoparticles

Area(s) of study: Health Sciences

**Divya Shah, Ami Vora, Jing Yang Xu, Hongquan Zhang\***

FACULTY OF SCIENCE

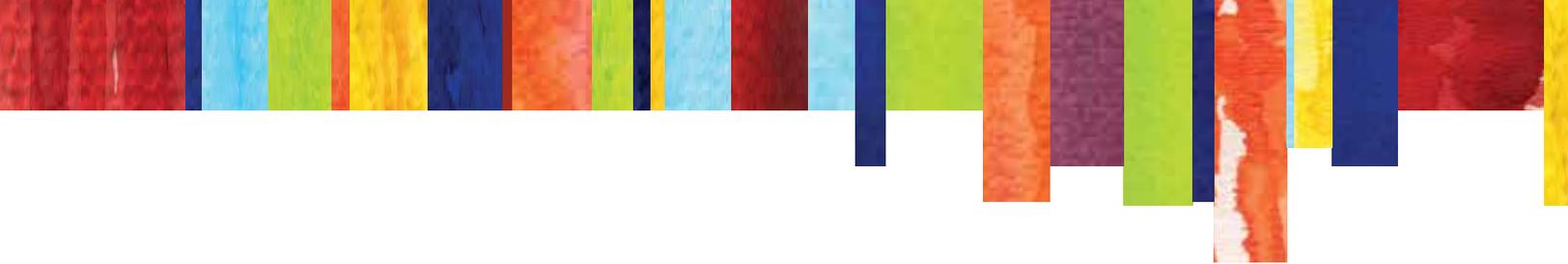
Gold nanoparticles (AuNPs) are used as scaffolds for DNA tracks that allow DNA motors to function. AuNPs can be used with DNA motors to detect various biological targets, including nucleic acids and proteins. However, the use of antibodies as affinity ligand causes high background signal because AuNPs can non-specifically adsorb proteins. The objective of this study was to construct DNA motors using AuNPs that can obviate the nonspecific adsorption.

By coating the AuNPs with streptavidin (STA), nonspecific interaction between AuNPs and other proteins can be reduced-decreasing background signal. Then, using STA-biotin chemistry, it is possible to use antibodies as affinity probes in constructing DNA motors for detection of more biological targets.

The main purpose was to increase the loading amount of STA per AuNP, increasing the density and loading amount of DNA strands on AuNPs. Higher loading amount of track strands can enhance signal amplification. We compared buffers with different pH for loading of STA onto AuNPs. Two methods were used to determine the loading amount of STA and DNA track strands.

The loading amount of STA is increased with decreasing pH. Increasing STA loading amount directly increases the number of track strands conjugated to AuNPs through STA-biotin chemistry. The quenching efficiency of this system is 95% at pH 3.0 and comparable at pH 4.0.

STA-coated AuNP can provide an efficient scaffold for construction of DNA motor systems. Use of STA-coated AuNP can allow antibodies to serve as affinity ligands in DNA motor systems, broadening the applicability of DNA motors.



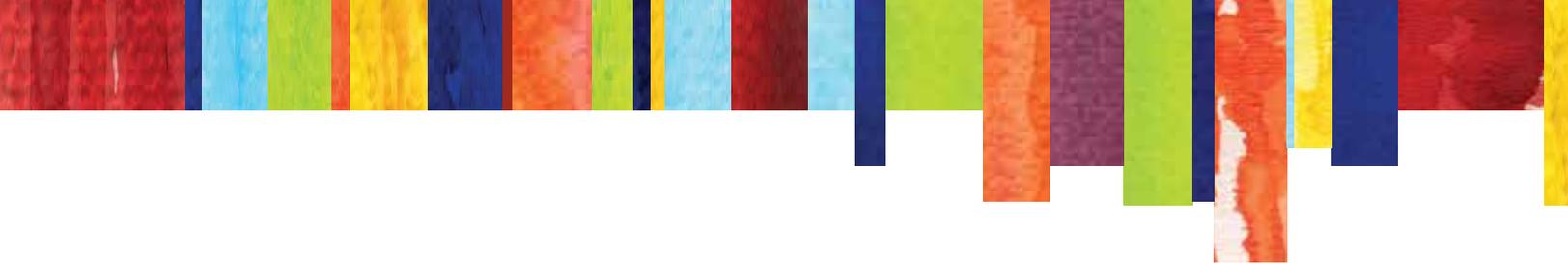
# P13. High-frequency rTMS in Ameliorating Depressive Symptoms and Stimulating Myelination in Rat Model of Depression

Area(s) of study: Health Sciences

**Di Zhang, Xiao Jing (Lily) Sun\*, Xin-min Li**

FACULTY OF MEDICINE & DENTISTRY

Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive therapy that produce electrical stimulation of the brain through a magnetic coil. High-frequency rTMS has been put forward as a new technique to treat people with depression that do not respond to the available pharmacological treatments. The main purpose of this project is to investigate the underlying mechanisms of high-frequency rTMS in treating depression. Rats were given Cuprizone, a chemical that destroys oligodendrocytes (supporting cells of the central nervous system), to generate a rat model of depression. Behavioural tests such as tail suspension test and sucrose preference test showed rats that undergone rTMS treatment demonstrated less depressive symptoms. Immunohistochemical staining of cell markers demonstrated rTMS to rescue oligodendrocytes by promoting its maturation. Significant neurogenesis was not found after rTMS treatment but further investigation is needed with better quantification methods. By alleviating depressive symptoms in animal model, rTMS may have therapeutic benefits for patients with depression. If the underlying mechanism of rTMS involves increasing oligodendrocyte maturation and neurogenesis, rTMS may be a potential treatment for other neurological disorders that involves the degeneration of supporting cells in the brain.



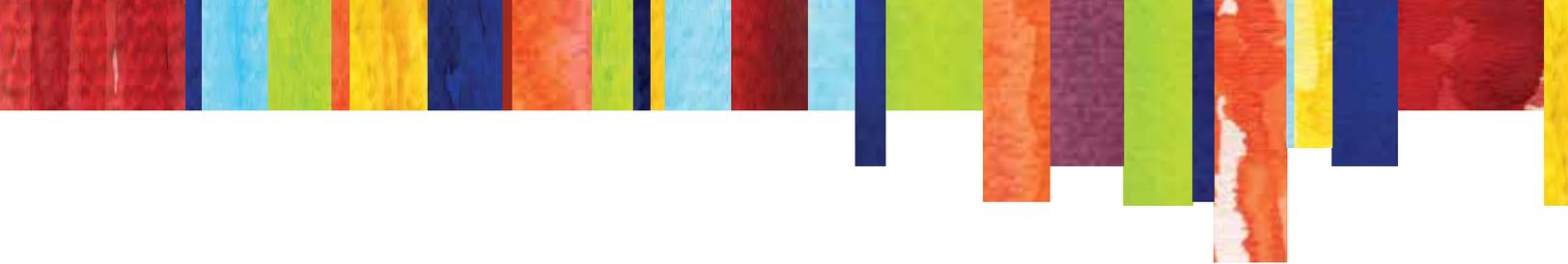
# P14. Patient preferences for continence care at end of life: a qualitative study

Area(s) of study: Health Sciences

**Nicholas Smith\*, Saima Rajabali, Kathleen Hunter, Robin Fainsinger, Adrian Wagg**

FACULTY OF PHYSICAL EDUCATION & RECREATION

Urinary incontinence, constipation and faecal incontinence are common at the end of life, and the burden of these symptoms may surpass that of pain. Generic end of life guidance about symptom management state patient preferences should be followed; however, little is known about what patient preferences are for continence care at the end of life. This qualitative exploratory study sought to determine what approaches to continence care palliative care patients prefer using individual semi-structured interviews. Patients in palliative care units in Edmonton who were incontinent and had sufficient cognitive function were identified by staff and were asked to participate. Private interviews were conducted until saturation was reached. Following a conventional content analysis approach, two researchers coded the interviews independently, and then collaborated to develop the coding framework and identify themes. Fourteen patients were recruited, 7 males and 7 females (mean age = 73 years). Three themes were identified: 'losing control', 'finding a way to manage', and 'caregivers can help and can hinder'. Most participants did not recall being asked about their care preferences. Many were not concerned with loss of dignity or embarrassment as many had accepted their situation. Staying clean and avoiding pain was a greater concern at end of life. Having to wait for staff to go the washroom or be changed caused patients pain and misery. Preferences of care varied based on the individual; however, patient preferences and concerns are important for healthcare providers to incorporate when developing a personalized continence care strategy at end of life.



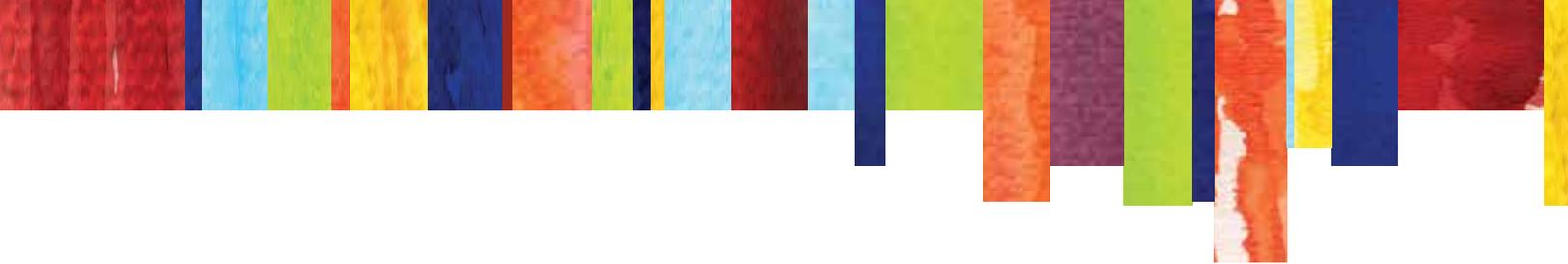
# P15. Adenosine transporters modulate baseline activity of the brain network that generates breathing: implications for apnea of prematurity

Area(s) of study: Health Sciences

**Megan Hansen\*, Sara Frangos, Robert Reklow, Gregory Funk**

FACULTY OF SCIENCE

The brain depends on a constant supply of oxygen - if this fails for even a few minutes permanent brain damage or death can result. Some infants born prematurely suffer from apnea of prematurity – a condition that features frequent apneas (periods when breathing stops), reflecting that the brain network that produces breathing (preBötzinger Complex; preBötC) is immature. “Apneas” can lead to life-threatening reductions in brain oxygen. Our research in animal models indicates that when brain oxygen falls two chemicals, ATP and adenosine, increase in the preBötC. ATP, is beneficial because it stimulates breathing. However, ATP degrades into adenosine which inhibits breathing, causing even greater, potentially fatal reductions in brain oxygen. The balance between these two chemicals appears key in determining the overall level of breathing. The main treatment for apnea of prematurity, caffeine, blocks adenosine actions. However, alternate treatments are required because caffeine does not work in all infants. In other brain regions, equilibrative nucleoside transporters (ENTs) are key in controlling the ATP- adenosine balance. ENTs transport adenosine across cell membranes along its concentration gradient. We used a brain slice preparation from newborn rats that “breathes” in a dish to determine whether ENTs affect ATP and adenosine signalling in the preBötC. Blocking ENT activity with a drug (NBMPR) increased baseline breathing frequency, whereas under conditions of elevated adenosine, as happens during hypoxia, it reduced breathing frequency. Data show that ENTs modulate the preBötC and that potentiation of ENTs may be a strategy to counteract the depression of breathing by hypoxia.



# P16. Effects of ganglioside GM1 on the immune proteins C1q and C3 in Huntington's disease

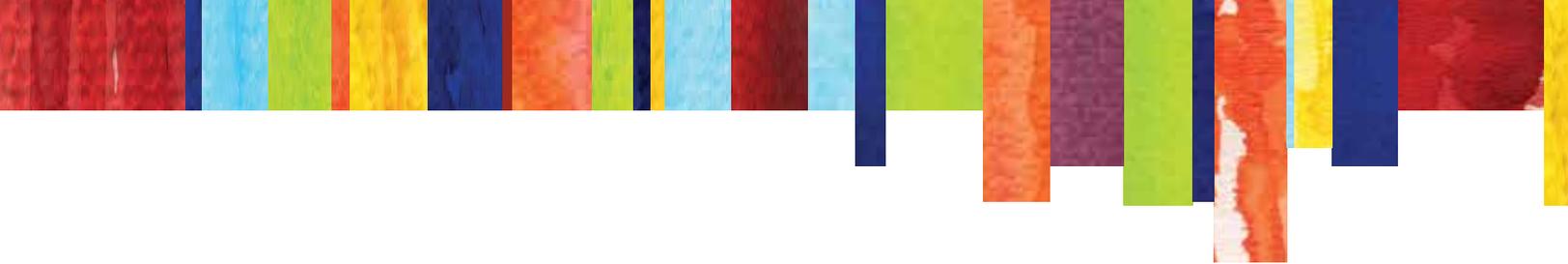
Area(s) of study: Health Sciences

**John Monyror\*, Danny Galleguillos, Melanie Alpaugh, Simonetta Sipione** | FACULTY OF SCIENCE

Huntington's disease is an incurable neurodegenerative disorder characterized by motor impairment, psychiatric symptoms, and cognitive decline. These symptoms are due to a wide array of dysfunctions that affect brain cells and make them degenerate. Previous studies have shown that a lipid called ganglioside GM1 is present at lower levels than normal in HD brains. In addition, proteins involved in immunity, C1q and C3, accumulate in the HD brain and perturb brain cell function, a phenomenon that also occurs in mouse models that lack GM1. Restoring normal GM1 levels in HD models protects brain cells and improves disease symptoms. We hypothesize that the beneficial effects of GM1 are mediated, at least in part, by restoration of normal levels of C1q and C3.

To test this hypothesis, I have measured levels of C1q and C3 in a mouse model of HD, at two different ages, and compared them to healthy mice. My results suggest that C1q levels are normal at 8 month of age, but they decrease in older HD mice (12 months). This is in contrast with previous reports in younger mice, and suggests a biphasic pattern of C1q expression during HD progression. On the contrary, C3 levels were elevated in older HD mice. In 8 month-old mice, treatment with GM1, while abrogating HD symptoms, did not affect C1q levels.

In conclusion, my preliminary data shows that C1q levels fluctuate during HD progression, and suggests that the beneficial effects of GM1 in HD models might be independent from changes in C1q.

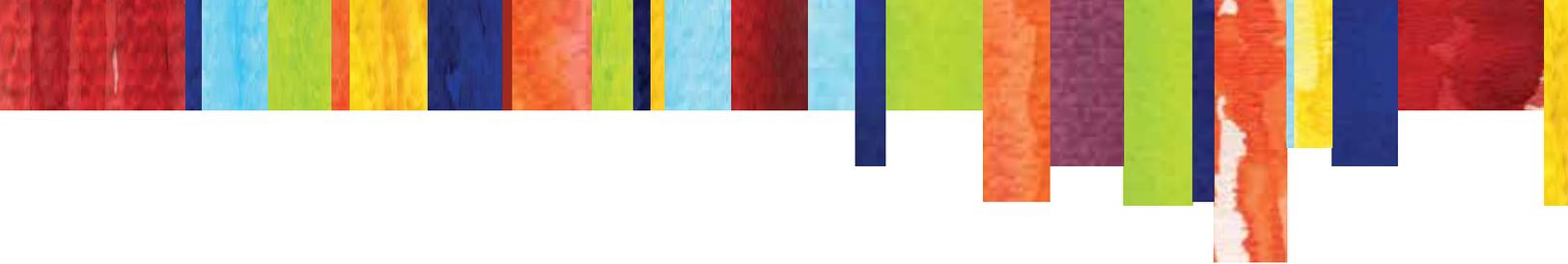


# P17. Improving quality of Resident Assessment Instrument – Minimum Data Set (RAI-MDS) 2.0 oral health assessments in nursing homes

Area(s) of study: Health Sciences

**Lily Lu\*, Matthias Hoben, Minn N. Yoon, Muhammad Moolla, Angelle Kent, Nadia Kobagi, Alix Clark, and Carole A. Estabrooks** | FACULTY OF NURSING

Nursing home residents often experience poor oral/dental care, leading to severe consequences, such as dental pain or oral inflammations. Lack of accurate oral/dental screening is a major reason for these gaps. The Resident Assessment Instrument – Minimum Data Set 2.0 (RAI) is a robust tool to assess residents' clinical/functional characteristics. However, its oral/dental components are not very accurate. The purpose of this study is to improve accuracy of RAI oral/dental assessments. This study consists of four components: (1) comparing regular staff RAI oral/dental assessments with assessments completed by trained research assistants (RAs) and dental hygienists (DHs) (assessment of accuracy of the RAI oral/dental items); (2) assessment of how well care staff understood the RAI oral/dental items, using 4 focus groups; (3) evaluation of assessment processes (same focus groups); and (4) development of strategies to improve accuracy of assessments. We found that RAs detect more oral/dental issues than care staff, suggesting that assessment quality can be improved by proper training and resources. However, agreement among two RA assessments of the same resident is less than optimal, while agreement of DH assessments is acceptable. Our next step is to derive suggestions for strategies to improve the accuracy of the assessments.



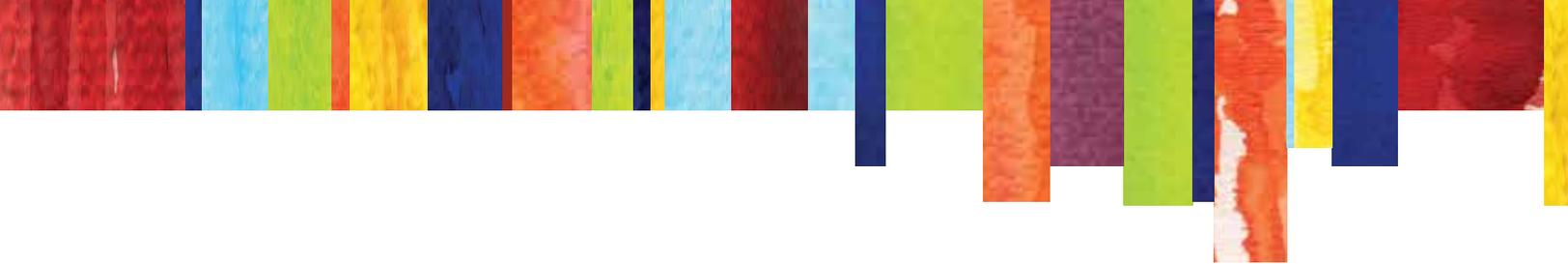
# P18. Characterization of Novel Na<sup>+</sup>/H<sup>+</sup> Exchanger Inhibitors for Use in Triple Negative Breast Cancer

Area(s) of study: Health Sciences

**Deborah Yee\*1, Xiuju Li1, Benjamin Buckley2, Michael Kelso2, and Larry Fliegel1** 1Dept of Biochemistry, University of Alberta 2Illawarra Health and Medical Research Institute, Wollongong, NSW, Australia

FACULTY OF AGRICULTURAL, LIFE & ENVIRONMENTAL SCIENCES

Breast cancer is the most common cancer diagnosis in Canadian women – being the second leading cause of death from cancer. One type of particular concern is triple negative (TN) breast cancer (negative for estrogen, progesterone, and ERBB2 (HER2) receptors), which tends to be more aggressive with a poor response to chemotherapy. The Na<sup>+</sup>/H<sup>+</sup> exchanger isoform one (NHE1) has been shown to facilitate metastasis in TN breast cancer. NHE is a plasma membrane transport protein that regulates pH by exchanging one extracellular proton for one intracellular sodium. Excess activity of NHE1 occurs in TN breast cancer, causing extracellular acidification and triggering metastasis. The objective of this project was to determine the effect of five novel inhibitors on the TN breast cancer cell line MDA-MB-231 cells. The hypothesis was that 6 substituted hexa methyl amiloride (HMA) derived inhibitors of NHE1 would prevent the metastatic behaviour in TN breast cancer cells. To test this hypothesis, a fluorometric assay was used to determine the NHE1 activity. Then, cell migration was analyzed with a wound-healing assay and cell proliferation was measured using a hemocytometer. Additionally, colony formation was evaluated with an anchorage dependence assay and cytotoxicity was measured using an MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. The results indicated that all the HMA-derived inhibitors significantly decreased NHE1 activity, with BB2-50F having the strongest effect. Testing of AA1-111 showed a decrease in cell migration and colony formation with no cytotoxic effects. AA1-135 had a similar but stronger effect, while also decreasing cell proliferation. These inhibitors showed favourable results towards decreasing the metastatic behaviour in TN breast cancer and may be potentially useful in identifying and developing more effective treatments for women diagnosed with TN breast cancer.



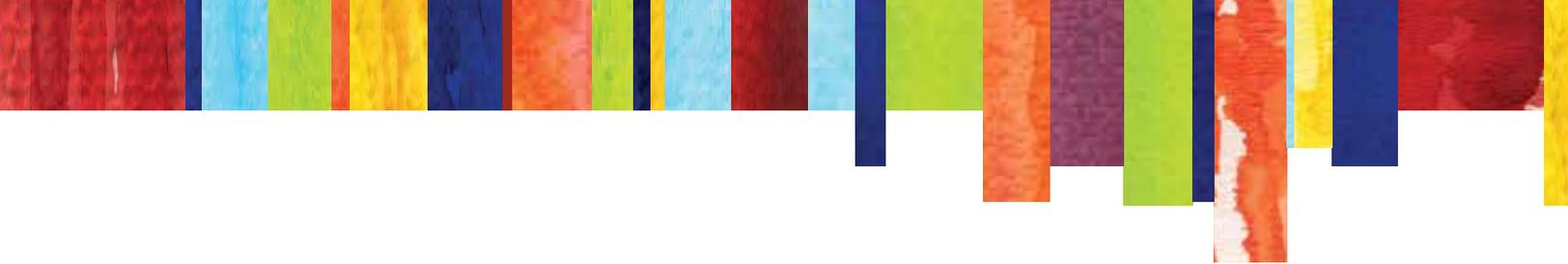
# P19. Improving Donor Blood Stability through Modulating Red Cell Senescence

Area(s) of study: Health Sciences

**Lu Kun Chen\*, Katherine Badior, Joseph Casey**

FACULTY OF SCIENCE

As red blood cells (RBCs) circulate, they become increasingly damaged and dysfunctional. Clearance of aged RBCs is essential to maintenance of circulatory function. Anion Exchanger I (AE1) is a senescence marker for red blood cells. During senescence, circulating immunoglobulin G antibodies bind to two sites on AE1, signalling the cell for macrophage degradation. Two regions of AE1 were identified as accessible on the extracellular surface, but a recently published crystal structure shows intracellular localization of one of the antigens. To reconcile these inconsistencies, we propose that senescence antigen forms when the cytosolic antigen becomes transiently accessible extracellularly upon a significant conformational change of AE1. To test this, we will attempt to trap this conformation, using a disulphide bond. Cysteine residues were introduced into the two halves of the antigen (one half is outside and the other is intracellular prior to conformational change). Cysteine double mutants were cloned using the Q5 mutagenesis kit on a cysteine-free AE1 cDNA background. These mutants were expressed in HEK 293 cells. Crosslinking of cysteine residues requires the use of the oxidizing agent, Cu-o-phenanthroline. To identify crosslinked products on SDS-PAGE gels, AE1 was proteolysed at K743 site, between the two antigenic regions. Crosslinked fragments indicate that the two Cys residues in the antigen came together, indicating a major conformational change to form the senescence antigen. Understanding the process of RBC senescence antigen formation has significance for understanding biological clocks and in storage of banked blood.

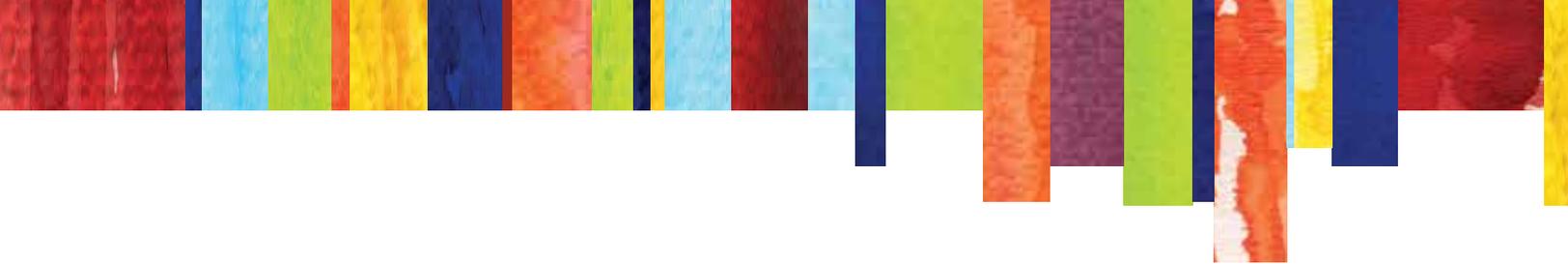


## P20. Does bumetanide improve outcome after intracerebral hemorrhage?

Area(s) of study: Health Sciences

**Cassandra Wilkinson\*, Brittany Fedor, Jasmine Aziz, Colby Nadeau, Frederick Colbourne** | FACULTY OF SCIENCE

Intracerebral hemorrhage (ICH), a bleed into the brain, is a devastating type of stroke that has no accepted treatment to limit injury or improve recovery. ICH causes damage and dysfunction through multiple mechanisms. Notably, ICH alters the concentrations of several elements, such as chloride in the brain, which is linked to brain swelling and altered electrical functioning. Bumetanide blocks a chloride channel, and thus should attenuate the increases in chloride to lessen brain swelling and improve electrical functioning after ICH. We will test this idea in an established rat model. After inducing an ICH in rats, we will treat them with bumetanide for three days (vs. vehicle control), after which we will measure behaviour along with water and chloride content in the brain. We expect that bumetanide will improve behaviour and lessen brain swelling and injury after ICH; and, if so, this would be a promising treatment for ICH patients.



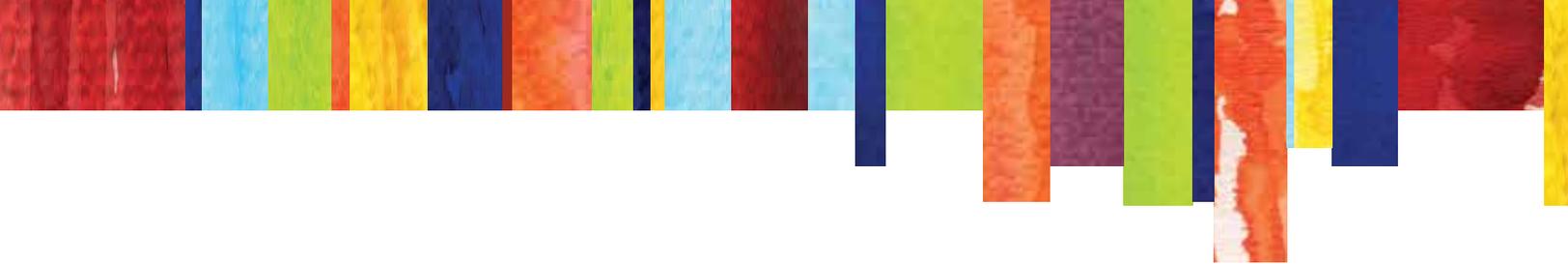
# P21. Assessing the Roles of Vitamin D on the Activity of TRPV1 Channels

Area(s) of study: Health Sciences

**Shubham Soni\***, Wentong Long, Koenraad Phillipaert,  
**Amy Barr, Peter Light** | FACULTY OF SCIENCE

Type 1 diabetes is an autoimmune disease characterized by a T-cell-mediated attack on the pancreatic beta-cells. The activation of T-cells is dependent on calcium influx through ion channels present in immune cells, such as TRPV1. Although TRPV1 is not the main target of vitamin D (VitD), previous lab results have shown the application of VitD to reduce TRPV1 activity in the presence of a channel agonist. Thus, our aim was to characterize the interaction between TRPV1 and VitD by using HEK and human T-cell models. We hypothesized that application of VitD directly inhibits calcium influx through the human TRPV1 channel in a concentration-dependent fashion. In doing so, we may reveal the mechanism by which T-cell activation can be reduced by VitD, and therefore, identify the importance of VitD in the development of type 1 diabetes.

Although the human T-cell model has native TRPV1 expression, we had to transfect HEK cells with human TRPV1 and a fluorescent protein, mCherry, to identify successfully transfected cells. Cells were incubated with a calcium-sensitive fluorescent dye (Fluo-4-AM) prior to imaging. Calcium signals were recorded for selected cells while they were perfused with control (buffer, ethanol, DMSO) and experimental (capsaicin, VitD) solutions. Functional TRPV1 expression in HEK cells was confirmed by comparing capsaicin-induced calcium influx to untransfected cells. Capsaicin-induced fluorescence showed rapid, high-slope fluorescence responses in TRPV1+ but not TRPV1- cells. A concentration-dependent response to capsaicin was optimized in preparation to observe modulatory effects of VitD application on calcium signalling.



## P22. Does pregnancy adversely impact the health-related quality of life among women?

Area(s) of study: Health Sciences

**Nicole Rodriguez\***, Lindsay Ambrosio, Reed Sutton,  
Levinus Dieleman, Brendan Halloran, Karen Kroeker,  
Farhad Peerani, Karen Wong, Richard Fedorak,  
Vivian Huang | FACULTY OF SCIENCE

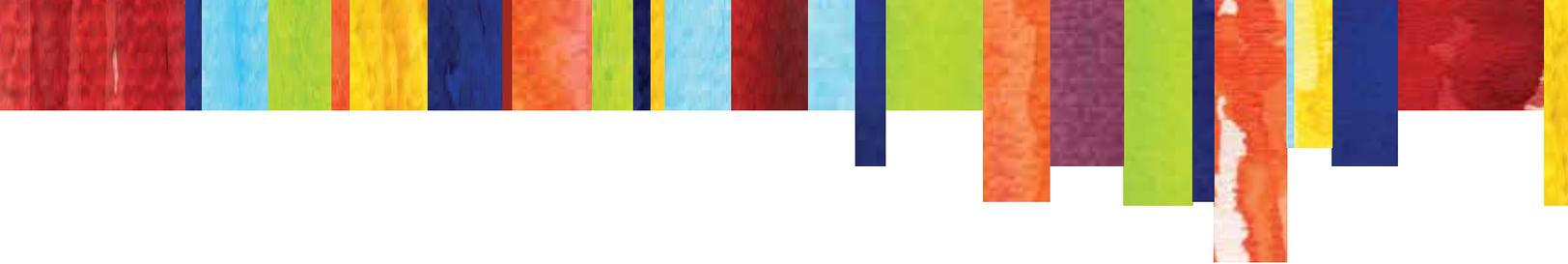
**Background:** Active IBD has been associated with poor health related quality of life (HRQoL). However, whether pregnancy-related changes also influence HRQoL of life is still unknown.

**Aims:** To assess the impact of pregnancy on the health related quality of life (HRQoL) among women with IBD and the impact of IBD disease activity on HRQoL in pregnant women with IBD.

**Methods:** Participants completed disease activity indices, Harvey Bradshaw Index (HBI) for CD or partial Mayo score (pMayo) for UC. Clinically active disease was defined as mHBI  $\geq 5$  or pMayo  $\geq 2$ ; whereas c-reactive protein  $\geq 8.0$ mg/L and fecal calprotectin  $\geq 250$ mg/kg indicated objectively active disease. Short IBD quality of life (SIBDQ) scores were collected during each pregnancy stage and compared between groups for diagnosis and disease activity. SIBDQ scores were compared using independent samples median t-test and differences between categorical variables were analyzed using chi-square test.

**Results:** A total of 70 women completed the SIBDQ survey during the follow up period. There were 11 (15.7%) healthy volunteers, 36 (52.4%) with UC, and 23 (32.9%) with CD. There was no difference in SIBDQ scores between healthy and IBD subjects. SIBDQ scores were lower in IBD patients than in healthy participants in trimester 2 of pregnancy. Furthermore, SIBDQ scores were significantly lower in patients with clinically active disease.

**Conclusions:** HRQoL was reduced in women with IBD and especially during clinically active disease during pregnancy. Women with inactive IBD during pregnancy have similar IBD related quality of life as women without IBD.

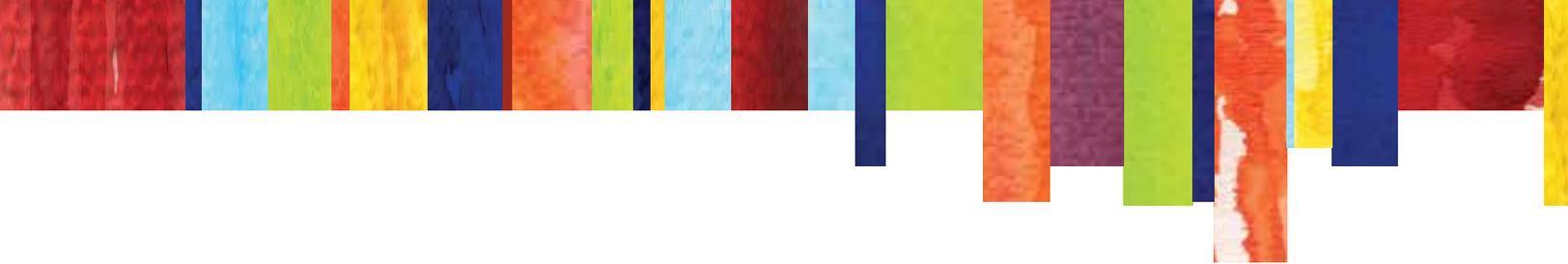


# P23. Magnetic Resonance Spectroscopic Biomarkers in Amyotrophic Lateral Sclerosis: A Multicentre Study

Area(s) of study: Health Sciences

**Ojas Srivastava\*, Chris Hanstock, Sneha Chenji,  
Dennell Mah, and Sanjay Kalra** | FACULTY OF SCIENCE

Amyotrophic lateral sclerosis (ALS) is a neurodegenerative disorder characterized by progressive upper and lower motor neuron (UMN and LMN) degeneration, manifesting in limb, speech and swallowing paralysis, and death within 2-5 years of diagnosis. Delays in diagnosis average 12 months, in part due to the lack of a sensitive and objective measure of cerebral degeneration. Magnetic resonance spectroscopy (MRS) is a MRI technique that non-invasively measures neurochemicals. It shows promise in providing markers of cerebral degeneration such as N-acetylaspartate (NAA), a metabolite localized to neurons. The objective of this study was to investigate cerebral neurochemistry in ALS. We hypothesized that (1) MR spectroscopic markers of neuronal integrity will be abnormal in the motor cortex and prefrontal cortex in patients with ALS, and (2) patients' cerebral metabolite ratios will correlate with clinical signs of UMN dysfunction and with disease progression. Sixty-five patients and 43 age-matched controls were studied. Subjects were recruited prospectively from Calgary, Edmonton, Montreal, and Toronto as part of a study in the Canadian ALS Neuroimaging Consortium (CALSNIC). There were significant differences in NAA in the motor cortex between patients and controls (NAA/Cr p-value<0.001, NAA/Ino p-value: 0.002). Moreover, cerebral metabolites in the motor cortex significantly correlated with disease progression (p-value: 0.03) and markers of UMN dysfunction (finger tapping p-value: 0.01, foot tapping p-value: 0.0001). Our prospective multi-centre investigation revealed that MRS is sensitive to detecting abnormalities in the motor cortex and has promise to provide a biomarker of cerebral degeneration and for use as a diagnostic aid in ALS.



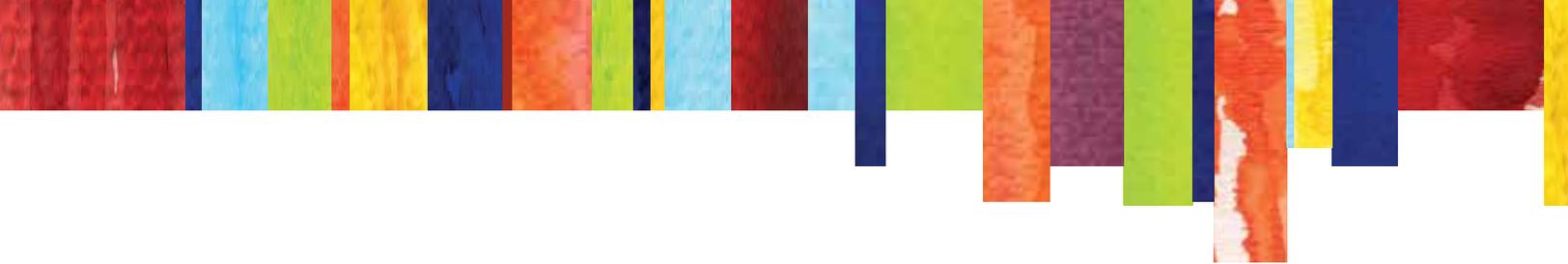
# P24. Acetylation and Succinylation Control of Cardiac Energy Metabolism in the Hypertrophied Newborn Heart

Area(s) of study: Health Sciences

**Simran Pherwani \*, Sonia Rawat, Arata Fukushima, Cory S. Wagg, Liyan Zhang, and Gary D. Lopaschuk**

FACULTY OF SCIENCE

In newborn patients with congenital heart defects (CHDs), the type of energy substrate used by the heart greatly affects its ability to withstand ischemic stress post-corrective surgery. Normally, there is a dramatic increase in cardiac fatty acid  $\beta$ -oxidation (FAO) post-birth, while glucose oxidation remains low until weaning. Hypertrophy (heart tissue thickening), occurring in many forms of CHDs, delays this normal maturation of FAO. Post-translational modifications (PTMs) like lysine acetylation and succinylation, on metabolic enzymes may impact these maturational changes. We examined whether these PTMs regulate the hypertrophy-dependent changes in newborn heart metabolism. 7-day old rabbits were given an aorto-caval shunt or sham surgery to induce hypertrophy. At 21 days, sham and hypertrophied hearts were subjected to isolated working heart perfusions. Left ventricles were processed for immunoblotting and immunoprecipitation. Heart tissue from newborn patients with CHDs was used alongside rabbit tissue. FAO rates decreased and glycolysis rates increased significantly with hypertrophy ( $p < 0.05$ ), while glucose oxidation rates were unchanged. Total ATP production significantly decreased with hypertrophy. Total acetylation in human hearts showed no significant difference, while total succinylation showed a significant decrease with hypertrophy. Rabbit heart protein expression of the FAO enzymes  $\beta$ -hydroxyacyl CoA dehydrogenase ( $\beta$ HAD) and long chain acyl CoA dehydrogenase (LCAD) were unchanged, however their acetylation significantly decreased with hypertrophy and showed a positive correlation with their enzymatic activity ( $R^2=0.64, 0.58$  respectively). Total succinylation, LCAD expression and succinylation, and mitochondrial deacetylase/desuccinylase SIRT5 expression showed no significant difference. We conclude that decreased acetylation decreases FAO in the hypertrophied newborn heart.

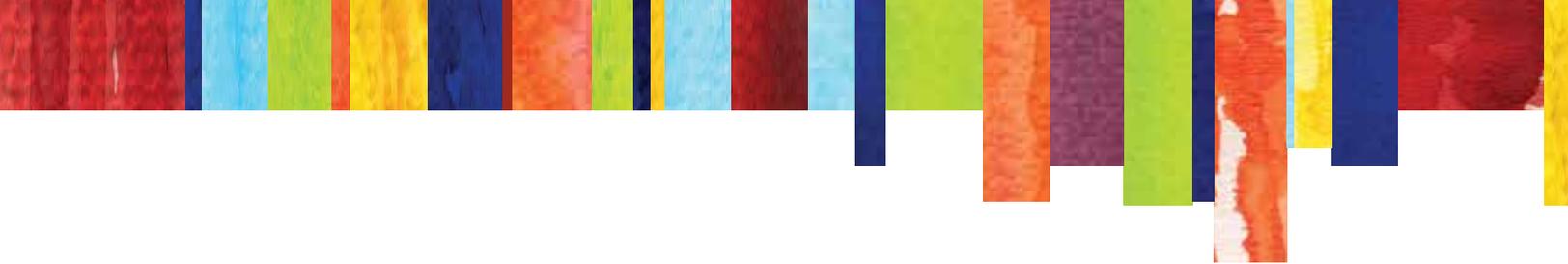


# P25. Genetic Interaction Results in a Novel Patient Phenotype consisting of Motor and Cognitive Impairment

Area(s) of study: Health Sciences

**Easton Munchrath\*, Richard He, Cory Rosenfelt,  
Francois Bolduc** | FACULTY OF SCIENCE

Intellectual disability (ID) affects 3% of the population and manifests with a variety of associated clinical features. Up to 800 genes have been identified in ID. There is significant variation in phenotype between ID patients, even when affected by the same gene. One of the potential reasons is the presence of polygenic interaction. Here we present a 9-year-old female patient born of consanguineous parents presenting with motor and cognitive delay, optic nerve atrophy, visual disorders, and a history of seizure. We performed whole exome sequencing to identify possible genetic anomalies. Variants were identified in the genes GBA2, ATP8A2, and TECTA. Mutation analysis software (SIFT, PolyPhen-2, and MutationTaster2) revealed these variants to have significant disruptive effect on the protein products. Interestingly, the symptoms and signs observed in our patient correspond to the compounded disruption of these genes. Homozygous TECTA mutation results in hearing loss through weakening of the tectorial membrane. Homozygous GBA2 mutation leads to a progressive disorder, with slowly degrading intellectual abilities and motor skills. On the other hand, homozygous ATP8A2 mutation tends to correlate with moderate ID, hypotonia, and chorea. Both GBA2 and ATP8A2 mutations are known to result in the loss of white matter. Interestingly, none of the genes identified so far in the patient are associated with epilepsy. Overall, our report shows that polygenic approaches can help explain better genotype-phenotype correlation in individuals with ID and that description of ID patients with single gene causes may be too restrictive.



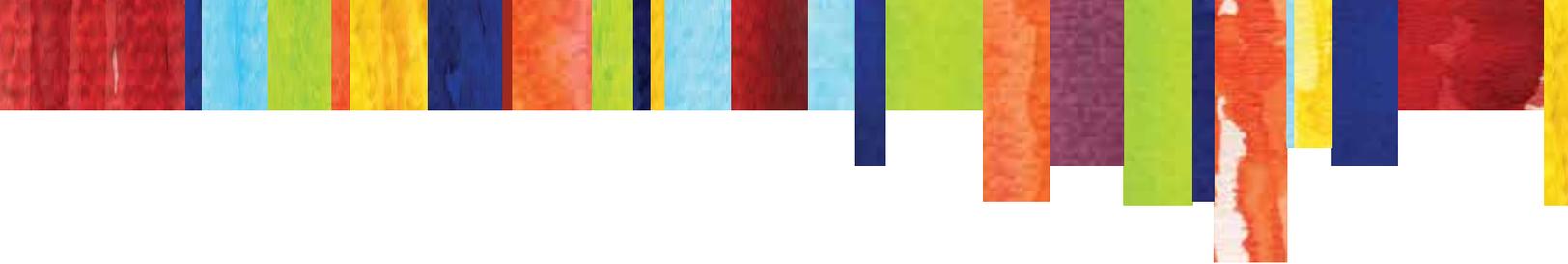
# P26. Finding a Cure for Blood Cancer

Area(s) of study: Health Sciences

**Justine Lai\*, Jing Li, Raymond Lai, Robert Gniadecki**

FACULTY OF SCIENCE

The progression of Mycosis Fungoides (MF), a type of blood cancer affecting the skin, is poorly understood. The progression of the disease is important to understand because patients in early stages of MF have an excellent lifetime expectancy, but if the disease progresses to the tumor phase, the patient survival time greatly decreases. One of the most significant hurdles to the studies of this disease is related to the fact that a very low number of MF cells are typically present in skin biopsy tissue samples. The main objective of this summer project was to develop a protocol to isolate MF tumour cells from a skin biopsy and to analyze their genes, in order to determine the genes involved in MF progression. Using a microdissection microscope, individual tumour cells were collected from the skin biopsy, however the biggest issue was obtaining enough RNA for analysis. After optimizing the RNA extraction protocol and amplifying the RNA, we found that sufficient RNA was collected for Nanostrings analysis, which is a technique used to identify the genes in RNA. Using these new methods that we developed, we identified a number of genes that might be implicated in the progression of MF. Going forward, we will use a larger cohort of MF samples to verify these genes and confirm their role in the disease. Identifying genes involved in the progression of MF are key in creating new therapeutics and diagnostic techniques for MF.

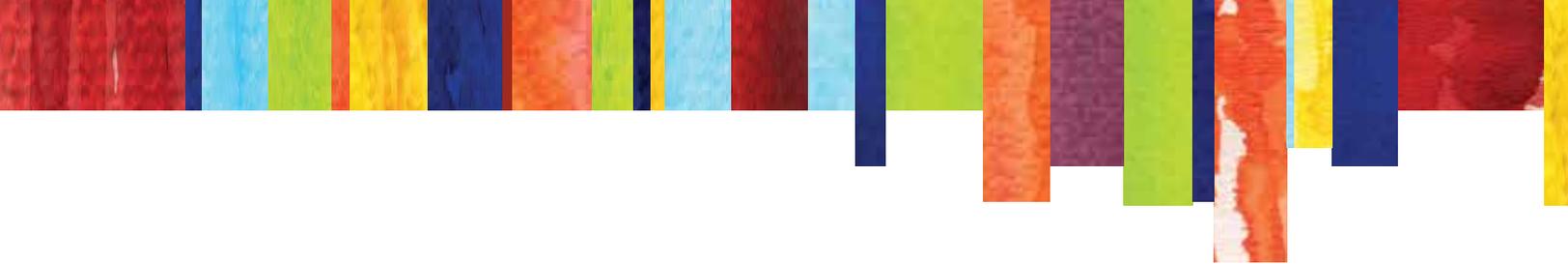


# P27. Inhibition of the Glaucoma-causing Gene, WDR36, Affects Ciliary Structure and Function

Area(s) of study: Health Sciences

**Jingyi Ma\***, **Serhiy Havrylov**, **Suey van Baarle**,  
**Ordan Lehmann** | FACULTY OF MEDICINE & DENTISTRY

Mutations in WDR36 cause primary open angle glaucoma, and contribute to complex glaucoma inheritance patterns. WDR36 is part of a large family, characterized by highly conserved WD-repeat domains. For those members with reported disease phenotypes, an unusually high proportion of WDR genes induce ciliopathies or ciliopathy phenotypes [10 of 29]. In this context, together with cilia having key roles in movement of extracellular fluid, I investigated whether WDR36 mutation caused the glaucoma phenotype by impacting ciliary structure/function. I inhibited WDR36 in murine fibroblasts [NIH3T3] by transfecting cells with 4 separate shRNAs [short hairpin RNAs], and measured WDR36 expression levels with qPCR. Next I used confocal microscopy to measure cilia length after immunostaining cells with appropriate antibodies for the basal body and cilia. Finally, to assess the function of a major cilia-mediated pathway [Hedgehog (Hh) signaling], I stimulated cells with 3nM Smoothed Agonist [SAG] and measured the response by quantifying Gli1 levels [a key effector of Hh pathway]. shRNA inhibition induced a ~40% reduction in WDR36 mRNA levels, and this in turn was associated with a 10-15% alteration in ciliary length. Preliminary data from a single experiment demonstrated an 8% reduction in Gli1 protein levels. These preliminary data are consistent with the hypothesis that WDR36 influences ciliary structure and function. The results require validation in replicate experiments, in which WDR36 is inhibited by shRNA, and separately over-expressed. Such analyses are in progress, together with studies to determine WDR36's cellular position, and whether it localizes to the ciliary axoneme or basal body.

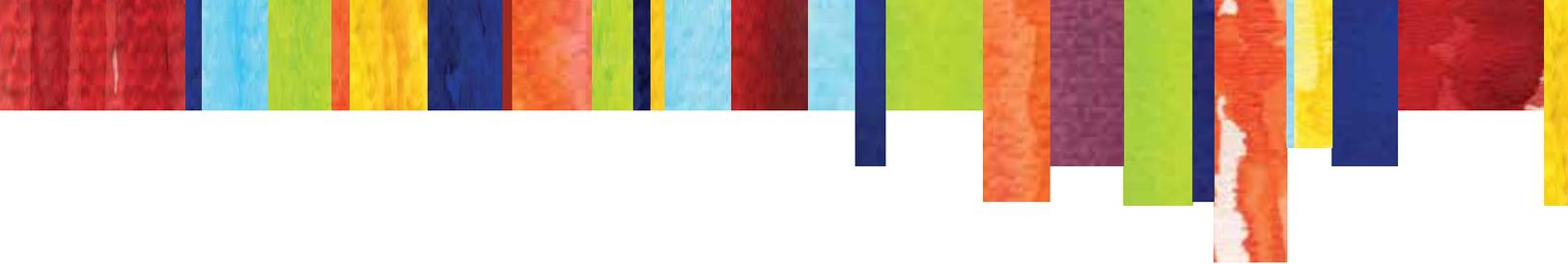


## P28. Interaction between gut microbes and genetic instability in anti-colon cancer immunity

Area(s) of study: Health Sciences

**Jianyin Liu\*, Courtney Mowat and Kristi Baker** | FACULTY OF SCIENCE

Microsatellite instable (MSI) colorectal cancer (CRC) is caused by deficient DNA mismatch repair and constitutes 15% of CRCs. MSI CRC has a better prognosis and stronger immune response than the more common chromosomal instable (CIN) CRC. The colon contains the largest number of bacteria in the body and increasing evidence suggests that gut microbiota have a strong correlation to CRC. Gut microbes and their metabolites can circulate through the whole body and this may contribute to cancer progression and tumorigenesis at either the microbial site or at a distant location from where the microbes originally reside. Microbes can contribute to genomic instability directly through genotoxins and oncoproteins, which induce changes to cellular DNA and impair DNA repair mechanisms, or indirectly by increasing epithelial cell replication and inducing inflammation. To understand if the interactions with intestinal bacteria that are known to promote or protect against CRC contributes to the different immune responses between MSI CRC and CIN CRC, we are going to compare how CRISPR mutated cells lacking MSI or CIN-associated genes respond to stimulation with whole bacteria that are either probiotic or infectious. We expect to observe different activation patterns of pattern recognition receptor (PRR), which regulate host cell recognition of bacterial components, after stimulation of MSI and CIN CRC cell lines with microbial species. We expect these patterns to reflect the magnitude of anti-tumor immune response seen in patients. Furthermore, we anticipate uncovering novel mechanisms for the immunogenicity of MSI CRC and identifying specific molecules or microbes that could be targets for a therapeutic intervention, which would increase anti-tumor immune responses against CRC.



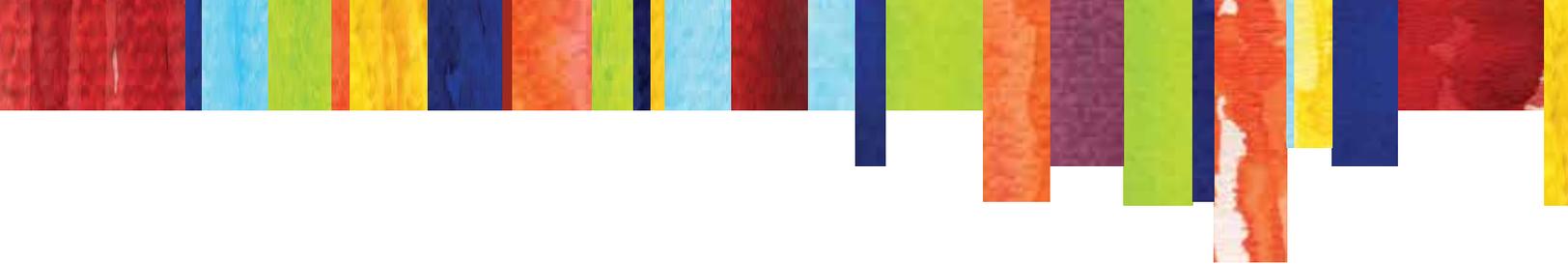
## P29. Intestinal permeability and inflammation in children treated for chronic HIV-1 infection

Area(s) of study: Health Sciences

**Victor Mocanu\*, Jeremy Soo, Jason Brophy, Fatima Kakkar, Ari Bitnun, Lindy Samson, Stanley Read, Hinatea Dieumegard, Aurée Janelle-Montcalm, Doris Ransy, Hugo Soudeyns, Michael Hawkes, EPIC4 Study Group**

FACULTY OF SCIENCE

HIV-1 infection establishes long-term gut barrier dysfunction, permitting the increased diffusion of microbial molecules into the bloodstream which sustains systemic immune activation and inflammation. A key feature of inflammation is endothelial activation (EA) whereby blood vessels change to better facilitate white blood cell egress into surrounding tissues to fight infection. Intestinal fatty acid binding protein (I-FABP) found in intestinal epithelial cells is abnormally elevated in plasma during intestinal diseases. Little research has addressed associations between I-FABP, inflammation, and EA in HIV-infected children. Using enzyme-linked immunosorbent assays (ELISAs), we conducted a cross-sectional analysis of plasma levels of I-FABP and markers of inflammation (interleukin 6 [IL-6], tumor necrosis factor alpha [TNF $\alpha$ ]) and EA (angiopoietin-2 [Ang-2], soluble vascular endothelial growth factor receptor 1 [sVEGFR-1], soluble endoglin [sEng]) in children with well-controlled vertically-acquired HIV infection (EPIC4 cohort). We included 97 children, 54/97 (55%) girls, with median age of 12 years (range 2-24). Categories of inflammation and EA markers show strong internal correlations ( $\rho > 0.47$ ,  $p < 0.001$  for all comparisons) and can be simplified to indices of "inflammation" and "EA" with principal component analysis (single markers explain 85% and 65% of variance, respectively). I-FABP, representing intestinal permeability, is strongly and positively correlated with "inflammation" ( $\rho = +0.70$ ,  $p < 0.001$ ) and "EA" ( $\rho = +0.41$ ,  $p < 0.001$ ). These results may help explain the long-term complications of HIV infection, such as cardiovascular disease, which are the leading causes of death of HIV-infected patients and pivot on endothelial dysfunction. Future studies should investigate long-term outcomes for children with elevated plasma I-FABP.



# P30. Activation of the inflammatory responses during ex vivo heart perfusion

Area(s) of study: Health Sciences

**Alexandra Kinnear\*, Sanaz Hatami, Darren Freed**

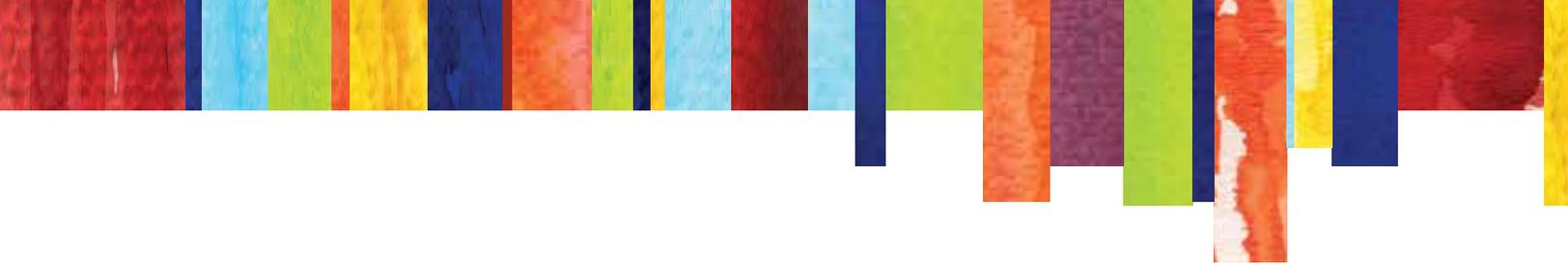
FACULTY OF MEDICINE & DENTISTRY

Background: Ex vivo heart perfusion (EVHP) is a novel method for preservation of donated hearts, capable of preserving the heart in a semi-physiologic, beating status outside of the body. The artificial surfaces in the EVHP apparatus can lead to activation of inflammatory responses affecting heart function. The aim of the study was to investigate the inflammatory responses during EVHP in working mode (WM) and non-working mode (NWM).

Methods: The hearts from 17 female domestic pigs were ex vivo perfused and cardiac function was assessed for 12 hours. The inflammatory cytokines in the solution pumped through the heart (perfusate) and left ventricular (LV) tissue of the heart were assessed using immunoassays and were compared between perfusion modes (NWM, n=6 and WM, n=7), and compared with baseline in vivo values (n=4).

Results: The cardiac function declined in both perfusion modes but was better preserved in the WM hearts. The perfusate levels of the pro-inflammatory cytokines including tumor necrosis factor alpha (TNF- $\alpha$ ), and interleukin (IL) 6, significantly increased during perfusion ( $p < 0.05$ ) with no difference between perfusion modes. LV tissue expression of IL-6, IL-1B, and TNF- $\alpha$  were higher in ex vivo perfused hearts and with in vivo values ( $p < 0.05$ ).

Conclusion: The inflammatory responses induced during EVHP in perfusate and LV tissue was independent of the perfusion mode. These inflammatory responses may play role in the decline of cardiac function during EVHP. Further studies are therefore needed to delineate the consequences of such inflammatory responses and methods to mitigate these effects during EVHP.

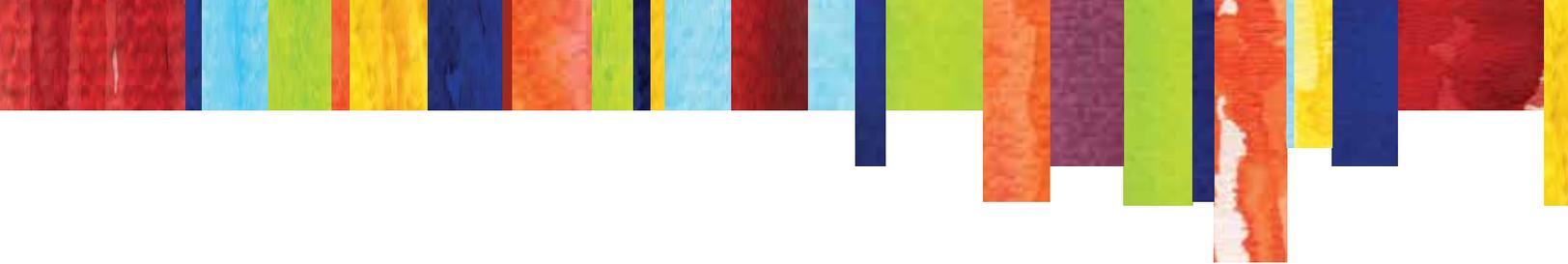


# P31. Low-income Patients with Palliative Cancer Diagnoses: What Are Their Symptom Relief Needs and Preferences?

Area(s) of study: Health Sciences

**Bronwen LeGuerrier\***, Sharon Watanabe,  
**Anna Santos Salas** | FACULTY OF NURSING

Socially vulnerable Canadian populations living with palliative cancer diagnoses often face difficulties managing symptoms and advocating for their needs. Our objective is to better understand the needs and preferences of this population from their perspective. To build on these perspectives we also endeavour to examine the economic and social conditions that may influence their experiences. A qualitative case study methodology is being used, combining both critical and participatory research. Ethics approval was granted in 2016. Participants are referred from palliative cancer clinics. Income status is based on clinician judgement and participant's neighbourhood. Additionally, participant's family members and health care providers are interviewed based on patient suggestion. Anticipated participant numbers will range from 12-20 by the end of summer 2018. Data collection includes in-depth individual interviews with patients, their family members and/or close friends, and their health care providers. As well, clinical data is collected as per ethics approval, and field notes are taken to provide context. Data analysis follows thematic analysis and a critical perspective to elucidate the effect that social disparities have had on the symptom experiences of study participants. Participant accrual is currently underway. Initial interviews have revealed significant issues pertaining to lack of financial means, difficulty managing symptoms, and timely access to health care services. Preliminary findings correlate with academic literature connecting social disparities and issues with symptom relief. Ideally findings will inform future community-based interventions aimed at supporting symptom management for low-income individuals facing palliative diagnoses.



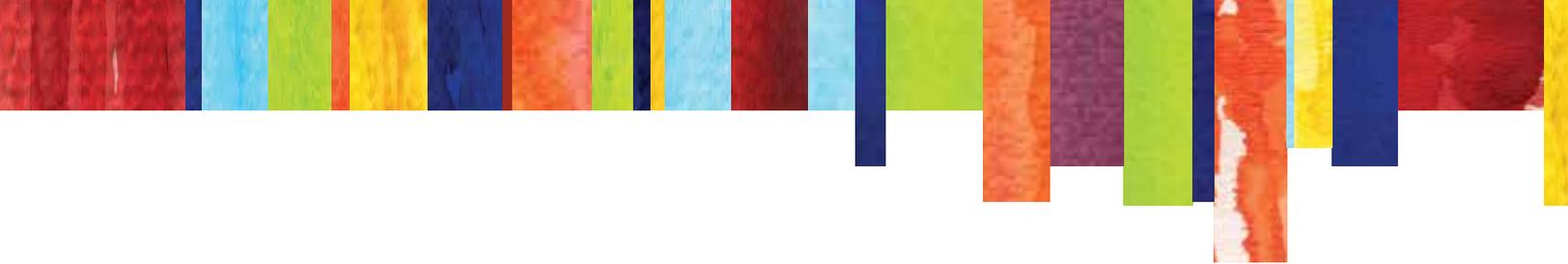
## P32. Pre-Pregnancy Dietary Patterns and Associations with Socio-Demographic Characteristics

Area(s) of study: Health Sciences

**F Ramazani\*, N Mathe, M Jarman, M Pakseresht, PJ Robson, S Johnson, RC Bell and the ENRICH study group**

FACULTY OF MEDICINE & DENTISTRY

Few studies have explored dietary patterns of women prior to pregnancy. The objectives of this study were to: (i) derive pre-pregnancy dietary patterns for women enrolled in a prospective cohort in Alberta and (ii) describe associations between diet patterns with socio-demographics. Using a 142-item Food Frequency Questionnaire, the foods and beverages consumed by 1545 women 'prior to pregnancy' were assessed; alongside sociodemographic characteristics and pre-pregnancy physical activity (PA). Dietary patterns were derived using principal components analysis (PCA). Associations between socio-demographics and dietary patterns were assessed in linear regression models. The PCA identified 4 dietary patterns termed: 'Healthy Eating', 'Meat and Refined Carbohydrate', 'Beans, Cheese and Salad' and 'Tea and Coffee'. Higher 'Healthy Eating' scores were more likely to be seen in those with greater educational attainment ( $\beta 0.15; P < 0.001$ ), non-Caucasian ethnicity ( $\beta -0.52; P < 0.001$ ), and more PA from sports ( $\beta 0.07; P = 0.045$ ). In contrast, women who were obese had lower scores than those with a normal BMI ( $\beta -0.21; P = 0.02$ ). Women with higher 'Meat and Refined Carbohydrate' scores were more likely to be non-Caucasian ( $\beta -0.37; P < 0.001$ ) or have lower education ( $\beta -0.08; P = 0.001$ ). Women with higher 'Beans, Cheese and Salad' scores were more likely to be Caucasian ( $\beta 0.41; P < 0.001$ ), have higher household incomes ( $\beta 0.08; P = 0.02$ ), and higher total PA scores ( $\beta 0.05; P = 0.03$ ). Higher 'Tea and coffee' scores were associated with advanced age ( $\beta 0.02; P = 0.01$ ), Caucasian ethnicity ( $\beta 0.18; P = 0.001$ ), and greater PA from work ( $\beta 0.41; P < 0.001$ ). This study highlights key food consumption patterns that explain variation in women's diets prior to pregnancy. A better understanding of women's dietary patterns is necessary for developing interventions and public awareness.

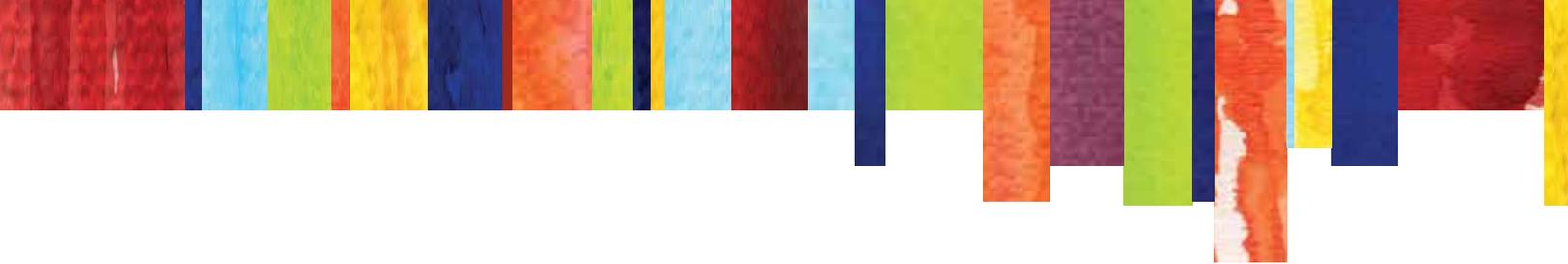


## P33. Investigating the role of Active Beta-Catenin in tumour progression and metastasis in Neuroblastoma.

Area(s) of study: Health Sciences

**Jamie Stark\*, Noureen Ali, Sujata Persad** | FACULTY OF SCIENCE

Neuroblastoma (NB) is a childhood cancer that develops from neuroblasts, immature nerve cells in the sympathetic nervous system, derived from neural crest cells. Of cancer deaths in children, ~15% are due to NB. Identifying and understanding proteins in pathways that contribute to initiation and progression of NB can provide potential drug targets for NB treatment. One such protein is  $\beta$ -Catenin, the primary effector of the Wnt signalling pathway. This pathway plays an important role in normal neural crest stem cell proliferation and differentiation, but is involved in development of NB when deregulated.  $\beta$ -Catenin is a transcription factor for genes involved in proliferation, so is oncogenic when deregulated. The Wnt pathway mediates  $\beta$ -Catenin activity through regulating the phosphorylation state of 4 amino acid residues. Therefore, higher levels of transcriptionally Active  $\beta$ -Catenin (ABC), in which two amino-acids are phosphorylated, likely contributes to increased aggression, invasion and metastasis. The goal of this study is to determine whether up-regulation of ABC is involved in progression of NB and if it can be used as a prognostic marker. Several NB cell lines were arranged into panel in order of aggressiveness by measuring migratory and invasive abilities of cell lines using migration and invasion assays. The amount of ABC in each cell line was determined via Western-blotting. Once a correlation between aggressiveness and ABC levels is established, causation will be tested by over-expressing an ABC reporter protein in neuroblasts, to determine if this in fact causes NB progression.



## P34. A useful tool in our toolbox: investigating a new method to measure immune markers in children

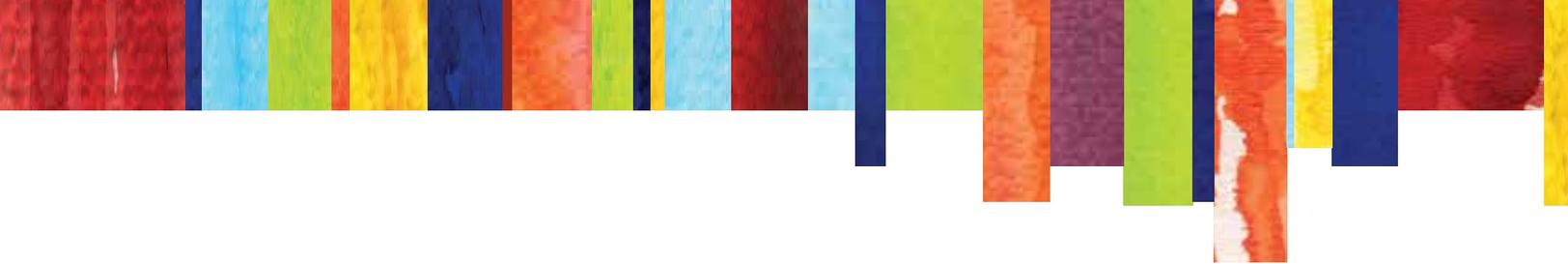
Area(s) of study: Health Sciences

**Morgan Sosniuk\*, Anne Halpin, Juanita Wizniak, Artur Szkotak,  
Simon Urschel, Lori J. West** | FACULTY OF SCIENCE

**INTRODUCTION:** Studying pediatric patients includes challenges such as difficulty obtaining samples, limited normal control data, and small sample volume. There are markers on blood cells that tell a story of what is happening in the immune system. Different blood cells are well characterized in adults using a standardized method called flow cytometry (ONE Study); comparable pediatric data do not exist. Our group had the opportunity to collaborate with the clinical laboratory to obtain normal pediatric samples. Our objective is to use flow cytometry to measure the profile of immune cells in healthy children and establish controls for future immune studies. We evaluated the programmed cell death protein 1 marker (PD-1), known as a measure of T cell exhaustion and gammadelta T cells, which are a rare cell in blood but important in immune function in the gut.

**METHODS/RESULTS:** Using less than 1mL of fresh, EDTA (unseparated) blood, we measured 50 immune markers in less than five hours. We included pediatric patients ranging from 66 days to 16 years of age (n=13). Preliminary analyses show age-related trends in gammadelta and PD-1+ T cells.

**CONCLUSIONS:** These results highlight important information about the pediatric immune system. We will continue to explore these age-related trends as we test additional samples and continue to analyse all the cell markers. This study highlights the value of partnership between research and clinical laboratories as it can facilitate access to otherwise difficult to obtain samples and is valuable to the clinical laboratory in the exploration of new methodologies.



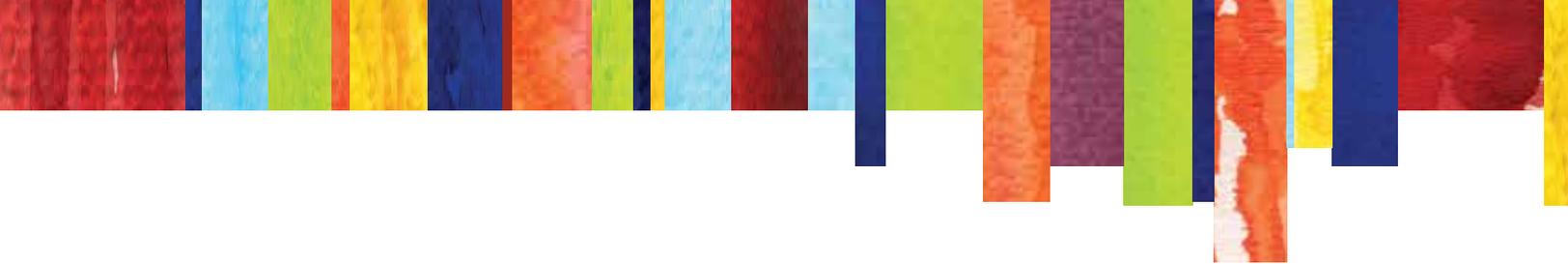
# P35. Characterization of Shiga toxin producing *Escherichia coli* using molecular methods

Area(s) of study: Health Sciences

**Jonas Szelewicki\*, Brendon Parsons, Shuai Zhi, Linda Chui**

FACULTY OF SCIENCE

Shiga toxin-producing *Escherichia coli* (STEC) produce toxins encoded by *stx1* and *stx2* genes that cause infection ranging from mild diarrhea to potentially life-threatening complications including hemolytic uremic syndrome, especially in young children. *Stx* genes are subclassified into ten subtypes, two of which (*stx2a*, *stx2c*) are often correlated with higher pathogenicity. It was hypothesized that there would be a correlation between presence of *stx* genes and clinical outcome. The objective of the study was to identify and characterize shiga toxin genes from 103 clinical *E. coli* O157 isolates from Alberta in 2016 and correlate gene subtypes with disease outcome, with patient epidemiological data included in the analysis. Following DNA extraction from isolates, real time-PCR amplification assays were used to detect and subtype *stx* genes. Our results showed that infection with *E. coli* O157 that carry the toxin gene *stx2a* or a combination of *stx1a* and *2a* subtypes produced the most severe clinical outcome. The majority of these patients were children, with a higher incidence of hospitalizations among the young and the elderly. The number of reported cases of *E. coli* O157 was highest in the summer months and in southern Alberta. In conclusion, this study shows the importance of detecting shiga toxin genes and their subtypes using molecular methods so early intervention including terminating the use of antibiotics and expanded hydration therapy might improve disease outcome in STEC patients.



# P36. Assessing the Role of STIM1 in ER Stress

Area(s) of study: Health Sciences

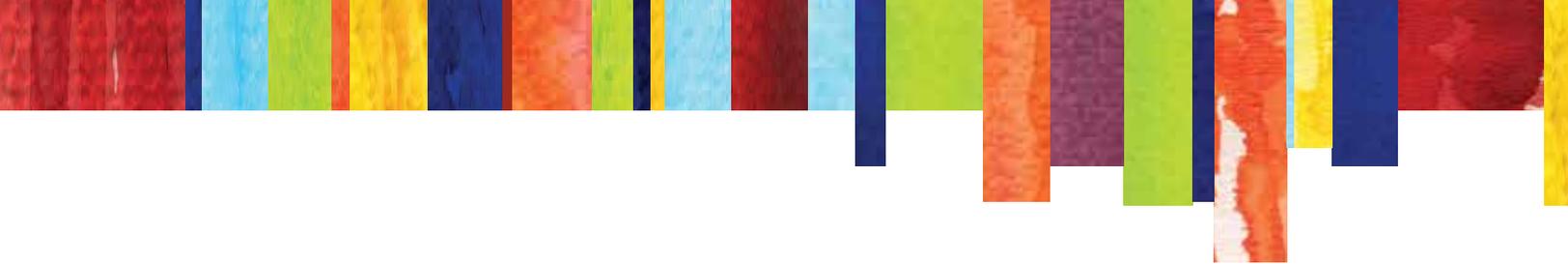
**Kevin Duong\*, Wen-An Wang, Marek Michalakw**

FACULTY OF MEDICINE & DENTISTRY

Ca<sup>2+</sup> within the endoplasmic reticulum (ER) is involved in signaling pathways that play roles in essential bodily functions, such as protein folding and metabolism. Loss of ER luminal Ca<sup>2+</sup> disrupts homeostasis causing misfolded proteins and ER stress. Therefore, ER Ca<sup>2+</sup> concentration is highly regulated by store-operated Ca<sup>2+</sup> entry (SOCE), a sophisticated cellular mechanism, which was developed for refilling ER Ca<sup>2+</sup> stores.

STIM1 (stromal interacting molecule) and Orai1 are key molecular components of SOCE. STIM, an ER protein, consists of a single transmembrane domain and an ER luminal domain containing two Ca<sup>2+</sup>-sensing EF hands. Upon ER Ca<sup>2+</sup> depletion, STIM1 molecules oligomerize, forming an interaction with Orai1, to initiate SOCE and allow Ca<sup>2+</sup> entry. Our lab found that in the absence of STIM1, cells have less ER stress. Therefore, the project's purpose is to address the role of STIM1 in ER stress.

To investigate ER stress, several stress markers were measured using western blotting and quantitative polymerase chain reaction. ER stress was measured in wild-type, STIM1 knockout (stim1<sup>-/-</sup>) mouse embryonic fibroblasts and stim1<sup>-/-</sup> cells stably transfected with wild-type and EF hand mutant (D76A) STIM1. Wild-type STIM1 was cloned into a pcDNA3.1/Zeo(+) vector. EF hand mutants were made using site-directed mutagenesis. The results suggest that wild-type cells have higher basal and induced levels of ER stress compared to stim<sup>-/-</sup> cells. However, whether this difference is due to the Ca<sup>2+</sup> sensing EF hand of STIM1 requires further investigation. Examining the role of STIM1 is significant because of its implication in necessary bodily processes.



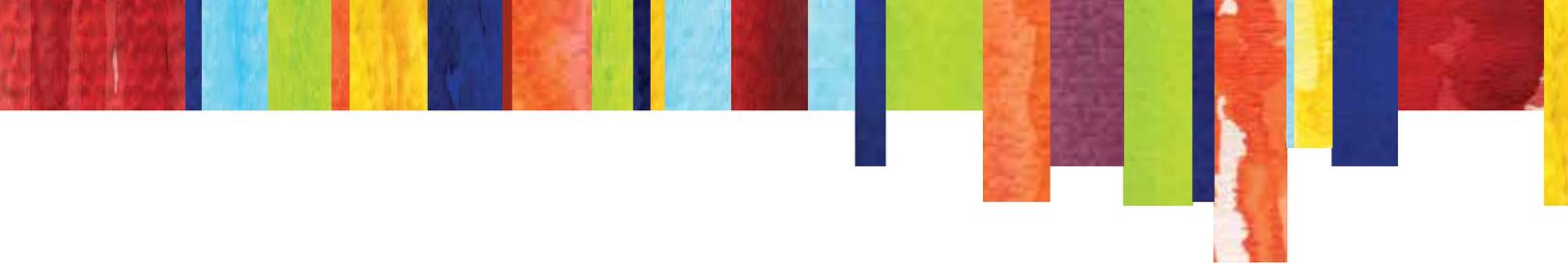
# P37. Exploring the Effect of Short Chain Fatty Acids on Gut-Brain Axis using a Microglial Cell Model

Area(s) of study: Health Sciences

**Dr. Kathryn Todd, Dr. Matthew Churchward, Dr. Dina Kao, Teresa Chen\*** | FACULTY OF SCIENCE

Studies of the human microbiome have developed the hypothesis of a gut-brain axis, a bidirectional communication system that occur through pathways like the Vagus nerve or bacterial products and metabolites, which include short chain fatty acids (SCFAs). Being blood brain barrier permeable, these SCFAs can influence the behavior of your nervous system by interacting directly with brain cells, including microglia. As part of the CNS's innate immune system, microglia are involved in both nervous and immune response and can contribute to illness behaviours, which if chronically and inappropriately activated, may contribute to the development of depression.

This hypothesis is based on data from another study, which used fecal microbiota transplantation (FMT) to treat *Clostridium difficile* infections and saw a large change in both SCFA concentration and reported quality of life measures. This project is related, but focuses on the influence of SCFAs on microglia and the potential for these metabolites to modulate the inflammatory response of microglia, which offers a mechanism connecting the changes in mood and microbiota in these patients. An in-vitro microglia model mimicking pre and post FMT conditions will be made with unique SCFA profiles, which will then be treated with an inflammatory stimulus and analyzed to determine its response. Testing for cell viability, proliferation, phagocytosis and inflammation, along with the release of cytokines and trophic factors will be used in developing each profile. The post-FMT condition is expected to have a reduced inflammatory response, which could highlight the influence of the microbiome in mental health.



## P38. New-onset urinary incontinence in hospitalized older persons (NO-HOPE): a prospective cohort study

Area(s) of study: Health Sciences, Other/Interdisciplinary

**Peter Anto Johnson\*, Saima Rajabali, Stephanie Gartner, Adrian Wagg** | FACULTY OF MEDICINE & DENTISTRY

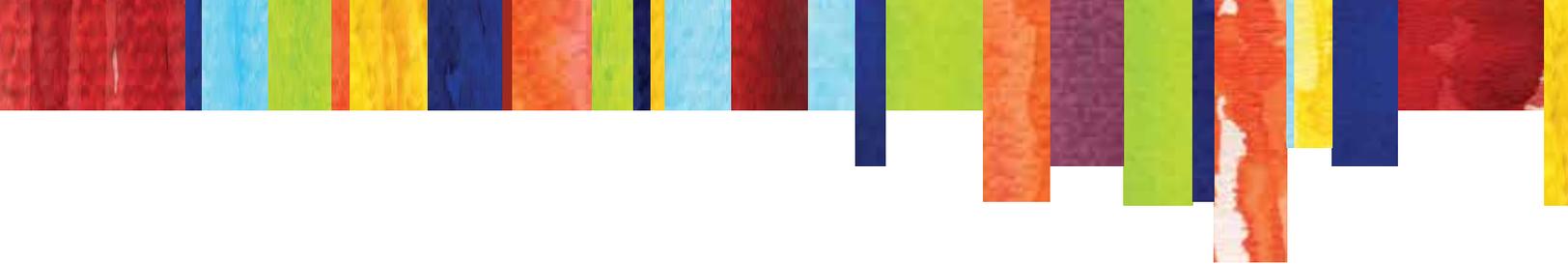
**Background:** Hospital stay is a major risk factor for new-onset urinary incontinence (UI). Between 10–21% of hospitalized adults report UI. New-onset UI is relatively understudied in acutely hospitalized older patients. Moreover, high rates of inappropriate usage of continence aids are reported in hospitals, despite proper usage mandates.

**Aim:** The objectives were to identify risk factors for new-onset UI and describe continence management in hospitalized older adults reporting continence prior to admission.

**Method:** Patients  $\geq 70$  years, within 48 hours of admission to in-patient units were screened. Questionnaires (rEFS; Barthel Index (BI); CCI; MoCA) were administered. Those incontinent, having catheters before admission, cognitively impaired, mechanically ventilated or fully dependent for care were excluded. Weekly hospital visits and telephone follow-ups after discharge were performed to document changes in continence status.

**Results:** Of the 83 screened, 13 were recruited. Duration of stay, procedures, transfers and physician/family visits were common exclusion variables. Patients scored mild to not frail on rEFS, had  $< 5$  comorbidities and were competent (MoCA: 22-30). Most were fully independent ( $n=7$ ; BI score: 100). The lesser ( $n=6$ ) scored low for stairs, mobility or both. Of new-onset UI cases, two had indwelling catheters and one was placed on diapers for management. Following discharge, catheterized patients remained incontinent, managing with in-home caregiver assistance and the other patient remained on diapers.

**Significance:** These findings point to mobility as a potential risk factor following admission per contra inappropriate product usage, utilizing the first successful prospective cohort model to assess risk factors and management in hospitalized older adults.

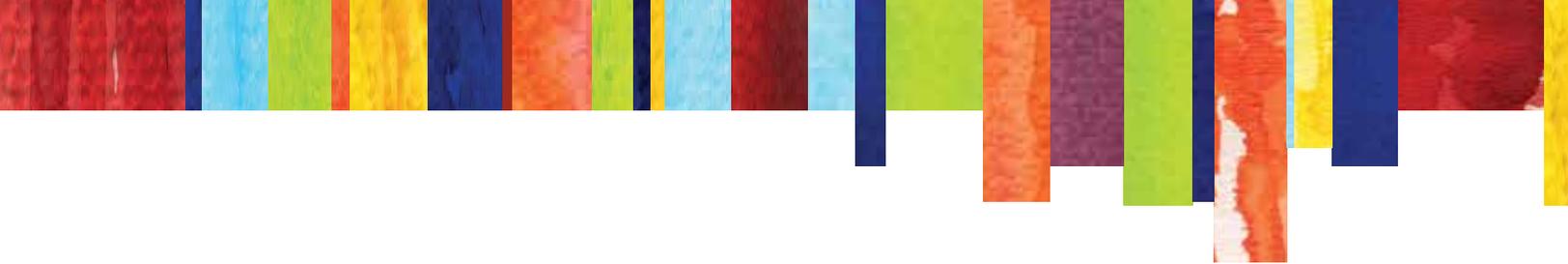


# P39. Biomedical Engineering Research — Australia

Area(s) of study: Natural Sciences & Engineering

**Megha Sharma** | FACULTY OF ENGINEERING

I am a third year undergraduate Chemical Engineering Coop student. I am very passionate about travelling and pursuing post grad. I was looking for an opportunity to travel abroad to gain research experience for my summer Engineering Coop work term. I applied for the Queen Elizabeth Scholarship to work at the University of Sydney in Australia. After filling out the extensive process, I was put into contact with Dr. Macewan to work on experimental Biomedical Engineering Technologies. The main research question was how to better the hospital experience for young patients, particularly diagnosed with Cerebral Palsy. This was being done in two ways. The first was a much more creative approach, which involved using electronic arts and virtual reality technology to create interactive displays in waiting and testing rooms. This would create a more positive experience of spending extensive time at the hospital. The second approach required more experimental data, which was using 3D printing to create comfortable casts for the children. The current approach of casting designs is not very customizable and takes much longer, hence, leave many of the young growing patients feeling uncomfortable and waiting very long. I was helping investigate how 3-D printing technologies could be used to improve the wait time and increase the customizability. The key results in my findings was creating a computational algorithm that automatically subtracts the negative spaces in the casts that are not needed for balance, where, other materials such as foaming could be added to create increased comfortability. From this finding, I am looking to get involved with the University of Alberta hospital to transfer my knowledge through my travel abroad research experience and learn about what process is being used for treatment in Edmonton.



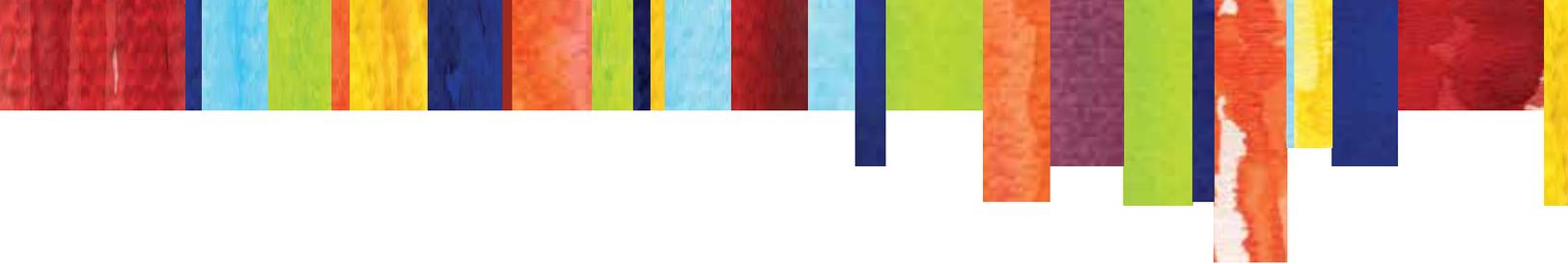
## P40. Use of a Thermally Equipped UAV to Enumerate Cattle in a Southern Alberta Feedlot

Area(s) of study: Natural Sciences & Engineering

**Claye A. Harsany\*, Justin T. Mufford, David J. Hill, Garrett Whitworth, John S. Church**

FACULTY OF AGRICULTURAL, LIFE & ENVIRONMENTAL SCIENCES

In the beef cattle industry, managers track animal inventories by manually counting cattle in individual paddocks within a large feedlot, which is a very time consuming and labor intensive task. Today's precision agriculture routinely uses sophisticated technologies such as robots, temperature and moisture sensors, and aerial images from unmanned aerial vehicles (UAVs). The use of UAVs in cattle production is an emerging technology that could potentially improve the efficiency of tracking animal inventory. UAVs are capable of capturing photos of cattle in a pen at a fixed height, which could potentially reduce the time required to perform this task. In this study, we aimed to develop an automated cattle-counting system using a thermal camera-equipped drone (DJI Inspire 1) and image processing software (ImageJ software). We successfully flew the UAV on an automated path to obtain thermal pictures of cattle in pens at a fixed height of 50 meters and counted the number of individuals in the picture using automated counting software. To reduce errors made by the counting software, we manipulated the thermal images to optimize the software's ability to count tightly spaced cattle. Using a thermally equipped UAV and computer to autonomously count cattle in a feedlot is much faster than manually counting. In addition, our autonomous methodology appears to have a high level of accuracy. Future work should include investigating seasonal temperature effects which might influence the quality of the thermal images.



# P41. Diffusion tractography of the fornix in a publicly available large, healthy population (Human Connectome Project)

Area(s) of study: Natural Sciences & Engineering

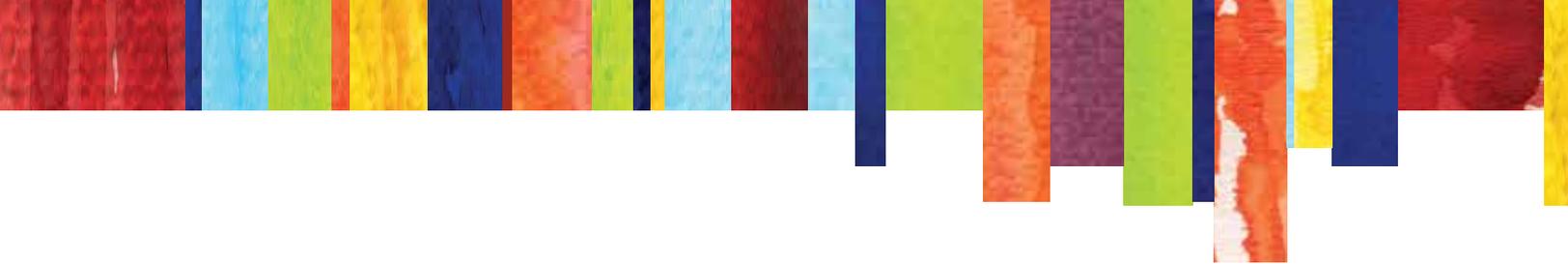
**Ariana Cahn\*, Pascal Tétreault, Sarah Treit, Graham Little, Christian Beaulieu** | FACULTY OF SCIENCE

**Intro:** Diffusion tensor imaging (DTI) is a method that allows for the in vivo dissection of human brain white matter. Using this technology, this study hoped to develop a novel and reliable tracking protocol for the fornix, the main efferent pathway out from the hippocampus.

**Methods:** Data was downloaded from the Human Connectome Project (HCP) to analyze the fornix, identify differences in its integrity across the given age span and between sexes. Fornix output parameters (FA, MD, RD, AD and volume) were equally tested against cognitive memory scores.

**Results:** MD, AD and RD of the fornix were negatively correlated with age, and sex differences were found in FA, MD, RD and Volume of the right fornix only. Significant differences were found between the left and right fornices for all parameters.

**Significance:** The fornix is a structure that is implicated in a multitude of neurological disorders. By better understanding the disorder's effect on fornix microstructure, this study has the potential to uncover a biological marker for memory impairments upon disease onset.

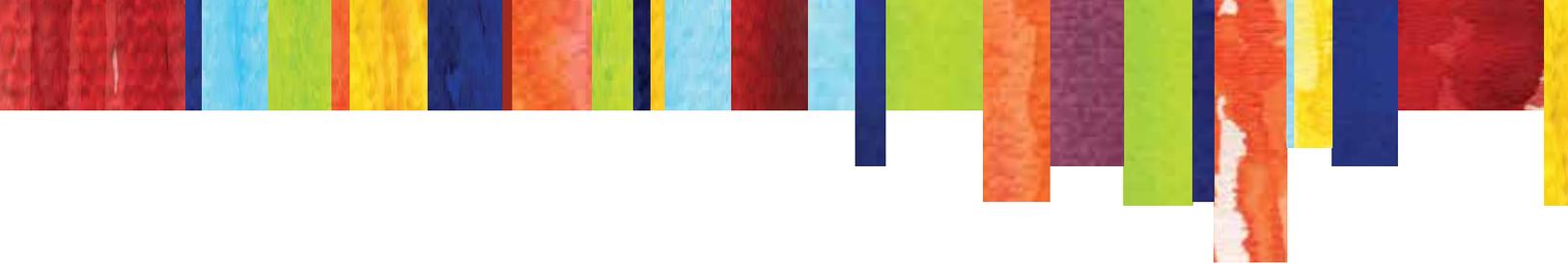


## P42. Eradication of Prussian Carp (*Carassius gibelio*) in North American rivers using a manual control method; implications for management

Area(s) of study: Natural Sciences & Engineering

**Jamie Card\*, Dr. Mark Poesch, Dr. Jonathan Ruppert, Caitlyn Donadt** | FACULTY OF AGRICULTURAL, LIFE & ENVIRONMENTAL SCIENCES

The introduction of invasive species to an area can have negative implications on the ecosystem and native biodiversity, especially in freshwater environments. Prussian Carp (*Carassius gibelio*) is native to Asia and is considered one of the most destructive invasive species in Europe. In 2000, Prussian Carp was first recorded in Alberta, Canada, and has already been shown to decrease native biodiversity. In light of the threat by Prussian Carp, we sought to develop an eradication protocol to help control their spread through manual control. In the summer of 2017, 30 sites were sampled along the tributaries of the Red Deer River in Southern Alberta by electrofishing. Block nets were fixed at each end of a 150m transect, which was sampled in three passes. All Prussian Carp were removed and these sites were resampled in the fall to assess the efficacy of manual control. Going forward, we aim to predict depletion success of Prussian Carp using a general mixed effects model including propagule pressure, invasion front, and distance to source. We hypothesize that the closer the site is to the source population, the less successful the control method will be, and that propagule pressure will be negatively related to invasion success. Additionally, we predict that propagule pressure and the success of the control method will be negatively correlated. These methods lay the groundwork for means to control the spread of this noxious invader beyond Canadian borders, therefore the results of this study will be invaluable for informing future management efforts.



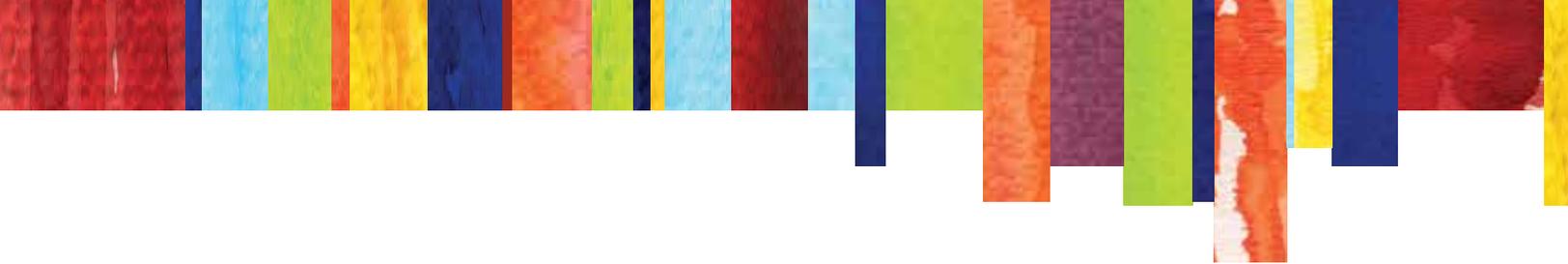
# P43. Evaluating Polyacrylate-styrene Copolymer (polyFAST) and Benzoyl-vinyl Acetate Copolymer (polyBOVA) as Possible Thickening Agents for CO<sub>2</sub> Fracturing Fluid

Area(s) of study: Natural Sciences & Engineering

**Meor Hashim\*, Christopher Chan, Natalie Eng, Crystal Liu**

FACULTY OF ENGINEERING

Hydraulic fracturing has been the conventional method of extracting hydrocarbons from shale formations. However, there is evidence to suggest that the process is detrimental to environmental and human health, mainly due to the chemical additives necessary for water-based fracturing fluid. Carbon dioxide fracturing, which uses a CO<sub>2</sub>-based fracturing fluid, has been proposed as an alternative that would eliminate the need for many of these chemical additives. However, the low viscosity and poor proppant carrying capacity of CO<sub>2</sub> is a significant obstacle to using this technique. Proppants are essential to the fracturing fluid as they increase the permeability of rock formations, allowing for the extraction of hydrocarbons. For this method to be viable, the physical properties of CO<sub>2</sub> fracturing fluids must be altered to improve their proppant carrying capacity. Based on previous studies, we propose an investigation of two polymers—fluoroacrylate-styrene copolymer (polyFAST) and benzoyl-vinyl acetate copolymer (polyBOVA)—as potential thickening agents to increase the viscosity of CO<sub>2</sub> and to optimize its ability to transport proppants. Assessing the solubility, viscosity, and proppant transport performance of the CO<sub>2</sub>-polymer mixture using both experimental and computational methods will provide a clearer picture as to which of the two proposed polymers is most suitable. This work will contribute to the continuing development of a fracturing technique that aims to minimize its environmental impact.

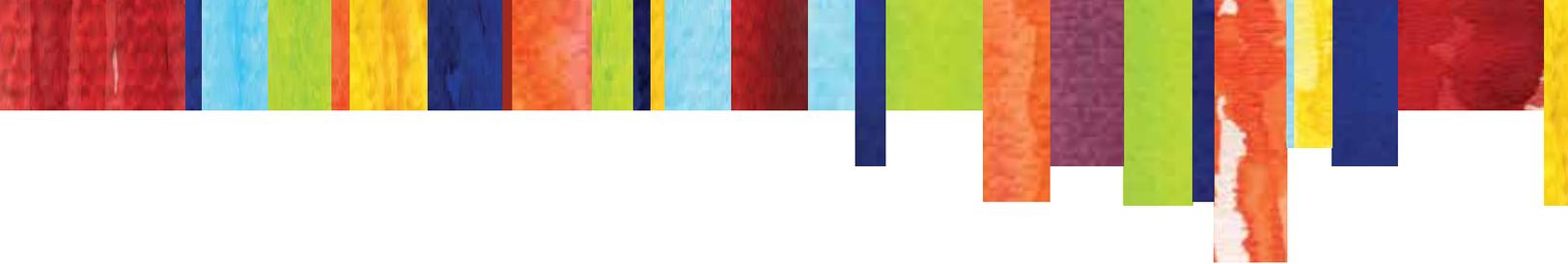


## P44. Determining history of a peatland pond through macrofossil analysis

Area(s) of study: Natural Sciences & Engineering

**Megan Schmidt\*, McKenzie Kuhn, Liam Heffernan,  
David Olefeldt** | FACULTY OF AGRICULTURAL, LIFE & ENVIRONMENTAL SCIENCES

Northern permafrost peatlands, composed of deep layers of frozen organic material, store significant amounts of the global carbon stock. Ponds and lakes are common, and while some have historically always been aquatic, others develop as warming temperatures cause permafrost to thaw, resulting in thermokarst ponds. These ponds have access to carbon previously locked in the permafrost, breaking it down and releasing it as carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). A significant unknown in climate studies is the magnitude and rate of production of these gases. Plant material preserved deep in peat can be used to determine the development and history of these ponds. When combined with CH<sub>4</sub> flux measurements from shallow aquatic sediments and the water surface, the source and quality of carbon can be assessed; from these, the amount of CO<sub>2</sub> and CH<sub>4</sub> released can be quantified. Macrofossil analysis of peat core samples was used to determine the history of the center of a suspected thermokarst pond in the discontinuous permafrost region of northern Alberta. While the presence of permafrost at the location of the sample is unclear, the presence of permafrost and thawing edges suggest that the study pond is indeed a thermokarst feature. Further work is required to obtain a more conclusive result, and is scheduled to take place in the fall of 2018.

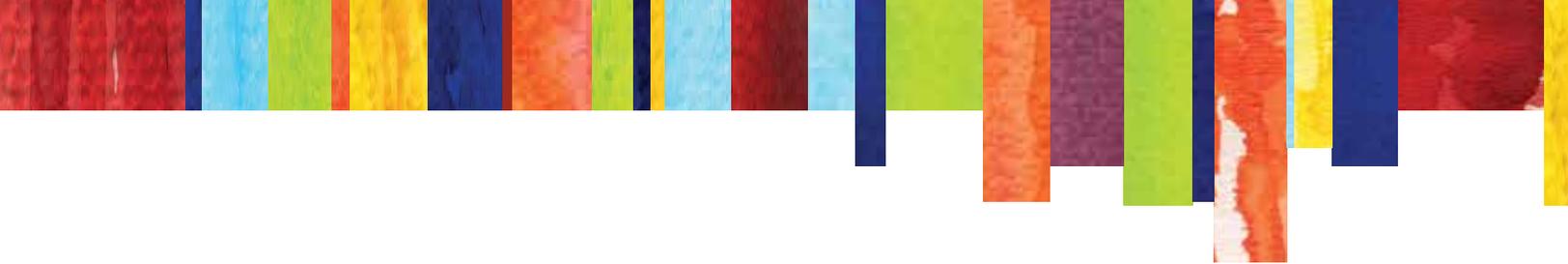


## P46. The prospect of electricity generation via tidal power: A case study on the Bay of Fundy.

Area(s) of study: Natural Sciences & Engineering

**Sydney Hampshire** | FACULTY OF SCIENCE

Both scientists and members of the public see the need for a diversified energy sector in order to combat the negative environmental effects and finite nature of electricity generation through fossil fuels. Renewable electricity generation could be the way to diversify and ultimately supersede fossil-fueled generation. However, it would require the careful consideration of the repercussions of such a change. Namely, how tidal power would impact the three pillars of sustainability; environmental, economic, and social, within the Bay of Fundy. Using a poster to compare the generation of electricity through fossil-fueled mechanisms with the generation of electricity through tidal power, a case study on current Bay of Fundy tidal power infrastructure was developed. A literature review was conducted on articles published recently in academic journals, found through Web of Science, and on materials released from the Fundy Ocean Research Centre for Energy (FORCE), the Government of Nova Scotia, and Natural Resources Canada. This methodology provided academic, industrial, and governmental perspectives on the prospects of tidal power in Canada. Published works showed that tidal power provides a consistent and relatively clean method of electricity generation. Additionally, it could bring significant economic growth to Nova Scotia and help develop world-renowned expertise in the field. Finally, due to its geography, there exists the possibility of completely powering the province of Nova Scotia with tidal energy. Groups like FORCE are leading the way in tidal power and their “Fundy Standard” means that work completed in the Bay of Fundy will be critical world-wide.

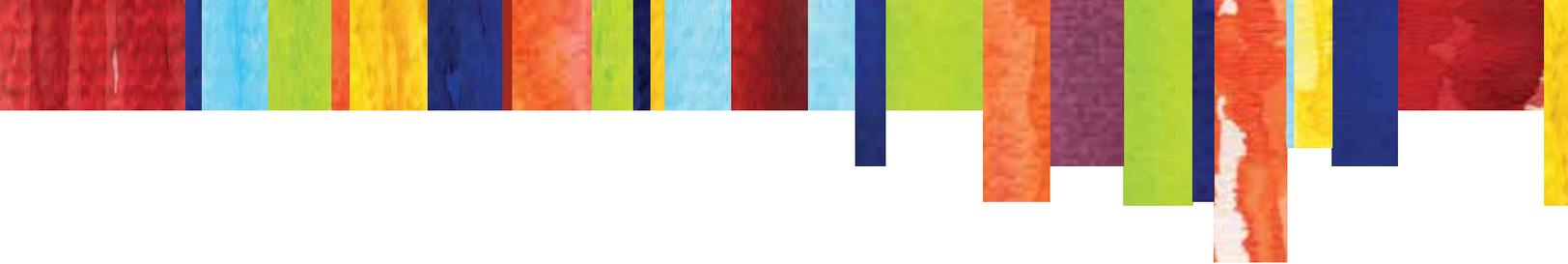


# P47. Potential Cell Cycle Regulation Mechanism

Area(s) of study: Natural Sciences & Engineering

**Rachel Maki\*, Kylie Parent\*, JoAnn Thai\*** | FACULTY OF SCIENCE

Regulation of the cell cycle and its checkpoints are essential for proper proliferation, beginning with chromosomal events during mitosis. Abnormal proliferation on the other hand is associated with chromosomal aberrations such as aneuploidy, a type of chromosomal mutation that is often observed in human cancer. O-GlcNAcylation, a type of post-transcriptional modification catalyzed by O-GlcNAc transferase (OGT), is a form of cell regulation dependent on nutrient levels in the cellular environment. We are interested in O-GlcNAcylation as a potential regulator of Myt1 kinase, a cell cycle “brake” that inhibits the activity of cyclin dependent kinase 1 (CDK1) by phosphorylation. Previous studies in our laboratory showed that loss of *Drosophila* Myt1 activity resulted in multipolar meiotic divisions, leading to aneuploid spermatids. In mammalian cells, elevation of OGT activity was reported to cause abnormal cell cycle arrest due to Myt1 inhibition of Cdk1, suggesting this as a new molecular mechanism linking nutritional cues with cell cycle control. We found that loss of OGT activity in *Drosophila* resulted in mutant intestinal phenotypes, as thus loss of Myt1 function. Thus, we are using the UAS-Gal4 system to generate transgenic lines with depleted OGT to study how loss of OGT affects specific cell types in the *Drosophila* intestine. Immunofluorescence and western blots will be used to characterize these defects. By this approach, we expect to gain insight into the relationship of OGT and Myt1 function in *Drosophila*.

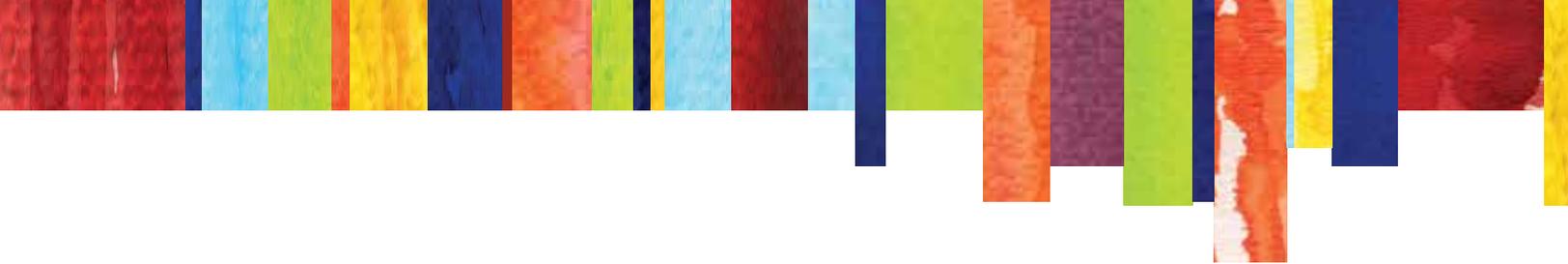


## P48. Conformational study of a chiral fluorinated organic compound by rotational spectroscopy and ab initio calculations

Area(s) of study: Natural Sciences & Engineering

**Colton Carlson\***, **Javix Thomas**, **Nathan Seifert**,  
**Fan Xie**, **Yunjie Xu** | FACULTY OF SCIENCE

Fluorinated organic compounds play an important role in pharmaceutical discovery because of their anti-tumor properties and have been used extensively in studying biomolecular binding. In this project the structural and dynamical characteristics of alpha-(trifluoromethyl)benzyl alcohol (FER), a stereochemically active fluorinated organic compound, are being examined by means of rotational spectroscopy. Rotational spectrum of the target was obtained using a chirped pulse Fourier transform microwave (CP-FTMW) spectrometer. The sample was introduced in a pulsed jet expansion with a trace amount of vapor generated from a racemic liquid of FER diluted in neon carrier gas. Additionally, ab initio calculations at the B3LYP/6-311++G(2d,p) level of theory with D3BJ dispersion correction have been employed to determine all possible conformations of FER. These predicted conformers have their own distinctive rotational spectra. Comparison with the experimentally obtained spectrum allows one to determine if a particular conformer is present or not and by how much. Thus far, three low energy conformations have been identified theoretically, and we are in the process of discovering them in the experimental spectrum. Such conformational recognition is difficult to achieve with other analytical techniques such as mass spectrometry or infrared spectroscopy. Thus, in addition to giving a deeper understanding of the physicochemical characteristics of FER, the results obtained from these experiments may be used to better explain biomolecular data which may appear illogical without the consideration of the presence of additional conformations.

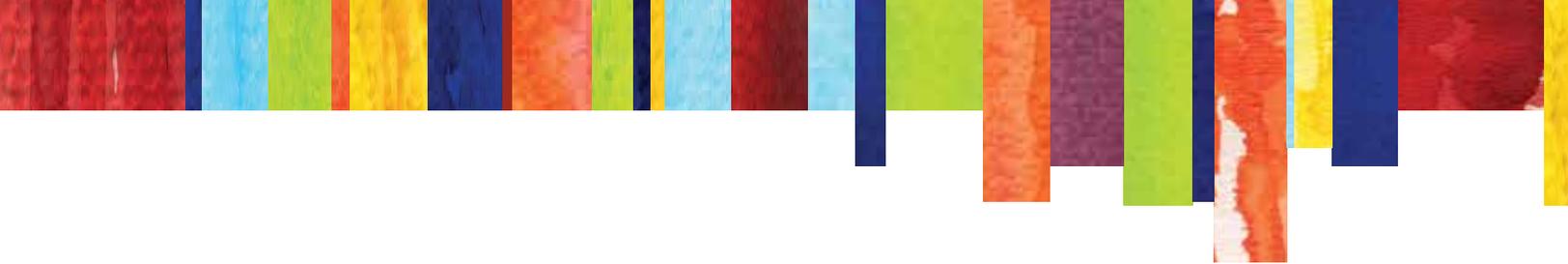


## P49. Characterization of ozone-depleting aerosols in the stratosphere

Area(s) of study: Natural Sciences & Engineering

**Rahul Ravin\***, **Stephanie Schneider**, **Sherry Gao**,  
**Nigel Rodrigues**, **Evans Frandsen**, **Jean-Luc Olsen**,  
**Harpreet Singh** | FACULTY OF ENGINEERING

Sulphate aerosols proposed by for use in Solar Radiation Management (SRM) can cause side reactions that deplete the stratospheric ozone layer. Calcite was proposed as a substitute for sulphate in a study by Keith et al. (2016) due to its inability to deplete ozone while matching the radiative forcing properties of sulphate. This project will experimentally verify the proposed theoretical models for SRM by exposing samples of calcite to stratospheric air for different amounts of time. Concentrations of reaction products will then be measured on the ground. The experiment apparatus will fly on an unmanned research balloon platform in collaboration with the Canadian Space Agency.

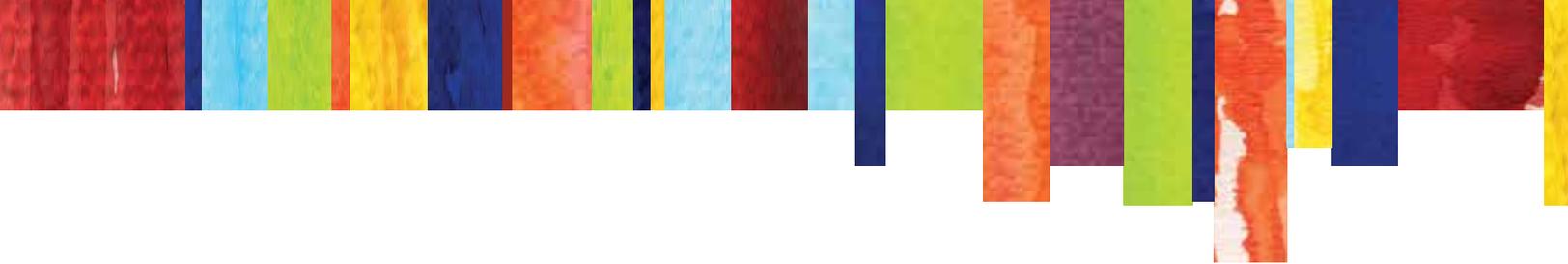


# P50. Retinoid regulation of inner ear development in zebrafish

Area(s) of study: Natural Sciences & Engineering

**Hayley Todesco\*, Kacey Mackowetzky,  
Andrew Waskiewicz** | FACULTY OF SCIENCE

Inner ear development is controlled by multiple genetic signalling networks that overlap spatially and temporally to pattern the formation of the various canals and chambers necessary for balance and movement. This project investigates the role of retinoic acid (RA) signalling, a vitamin A derivative, in the late developmental stages of inner ear structures using zebrafish larvae as a model organism. We anticipate that abnormal RA levels will impact development of the semicircular canals, three tubular structures that house sensory cells used to detect rotations of the head. Improper canal formation manifests as an inability for zebrafish to balance upright, causing them to tilt and swim in tight circles. From 28 to 120 hours post fertilization, developing zebrafish were treated with excess RA or an RA signalling inhibitor. Six days following fertilization of the embryo, swimming patterns were tracked computationally and analyzed to quantify whether a statistically significant difference in swimming behavior was produced. Injecting and imaging fluorescent dyes in the inner ear was used to identify corresponding gross structural defects produced by these treatments. Meanwhile, neuromuscular marker gene expression in treated larvae was imaged via immunostaining to rule out other causes of circling. Preliminary findings indicate that the initial steps of canal development are abnormal, and circling behavior is present in both treatment groups with varying degrees of statistical significance following alterations to RA signalling. This provides valuable evidence of RA's continuing role in inner ear development, contributing to current knowledge of the molecular basis of vertebrate sensory organ formation.



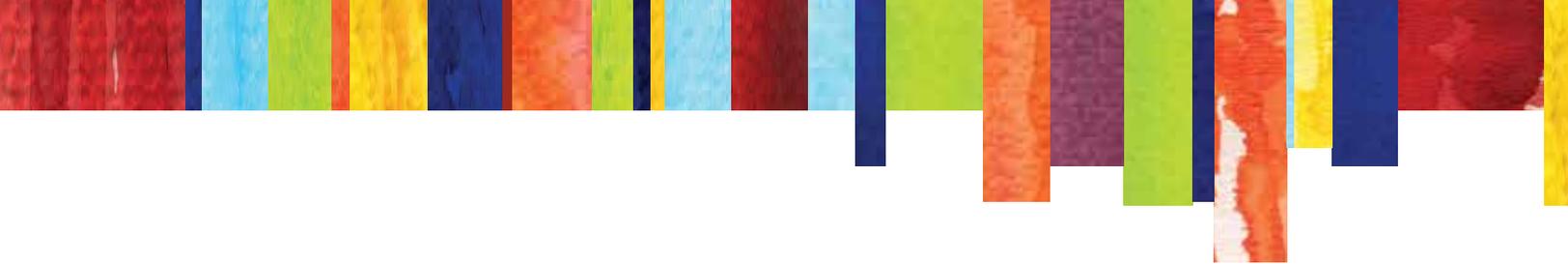
# P51. Dietary Analysis of Cougars Inhabiting Reclaimed Mines in Alberta

Area(s) of study: Natural Sciences & Engineering

**Mahmoud Gheblawi\*, Meghan Beale, Mark Boyce**

FACULTY OF SCIENCE

Land reclamation is a key policy point in environmental stewardship. With much of Western Canada having a resource based economy, the sustainability of natural areas for future generations is paramount. In our quest to return disturbed ecosystems to their former pristine states, are our reclamation efforts introducing new overlooked variables that haven't previously existed. These reclaimed habitats may be exerting environmental pressures that are non-existent in untouched sites. In this study we investigate whether cougars have developed a dietary preference for certain species when feeding on reclaimed mine sites as opposed to undisturbed habitats. Through dietary analysis we are able to infer whether the cats have a marked dietary preference. A change in predator dietary preference could have negative consequences on prey species. Certain species which we aim to protect may become easier targets leading to further population decline in reclaimed habitats. If predation is easier at these sites than we may see a shift in predator populations towards reclaimed habitats leaving prey populations in natural habitats unchecked.

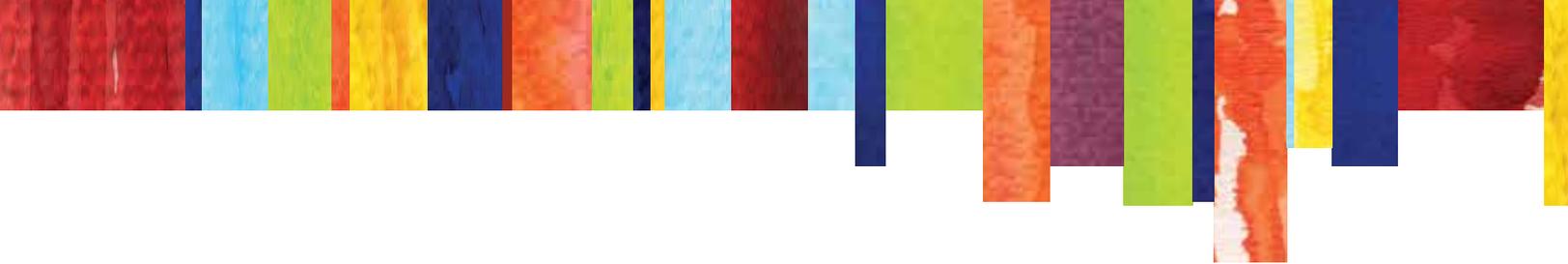


## P52. The Effect of Radiation on Immune Cell Populations in Colorectal Cancers

Area(s) of study: Natural Sciences & Engineering, Health Sciences

**Stephanie Rush\*, Kristi Baker** | FACULTY OF SCIENCE

Colorectal Cancer (CRC) is currently the second most diagnosed cancer in Canada. CRC almost always has a genetic basis and 15% of these cancers generally have a better prognosis than the remaining 85%. This 15% have microsatellite instabilities in the DNA, caused by mutations that cause faulty mismatch repair mechanisms (MMR). Radiation is used as a tool in cancer treatment because it is believed it stimulates the immune system to respond better to the cancer. We hypothesize that if radiation stimulates the immune system, cell lines co-cultured with immune populations that have been exposed to radiation will have an upregulation of genes involved in an immune response, compared to co-cultures with immune cells that do not receive radiation. MC38 and APC knockout organoids were used in the co-cultures. Immune populations were taken from the spleen, mesenteric lymph nodes, and bone marrow-derived dendritic cells. Cells were cultured in 24-well plates, and received radiation at varying dosages (2,5,10 grey) either with immune populations or without. Cell lines irradiated without immune populations had them added immediately after. Supernatant and mRNA were collected after 24 hours and analyzed for upregulation of cytokines and genes of interest. Cytokine and gene expression was not upregulated as was expected. This may suggest a different part of the immune system is responsible for the increased immune response, or that a different dosage of radiation is needed. Further research on the effects of radiation could help focus future radiation therapies for comprehensive cancer treatments.



## P53. Glucose regulation by glucocorticoids in the brain

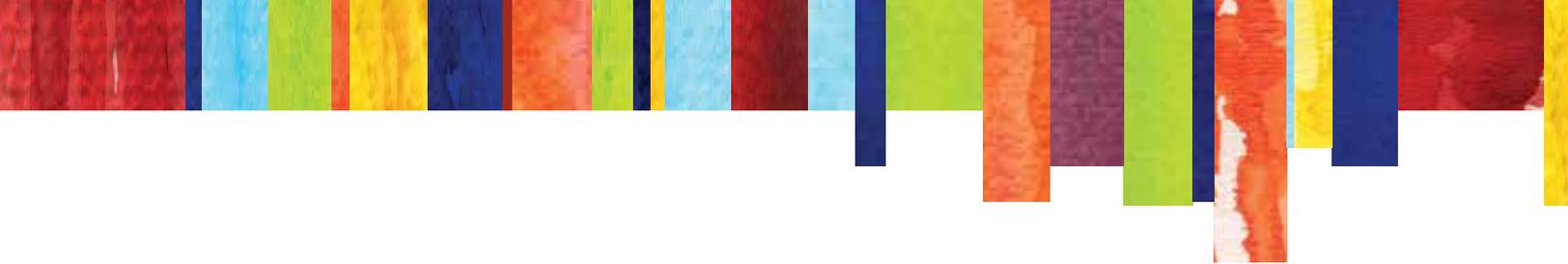
Area(s) of study: Natural Sciences & Engineering, Health Sciences

**Hyejun Kim\*, Jennifer Lee, Emilie Beaulieu-Bayne, Aleesha Amjad Hafeez, Emily Ling, Kyle Chankasingh, Jessica T.Y. Yue** | FACULTY OF SCIENCE

A dysregulation in glucose homeostasis is a key characteristic of diabetes and obesity-related insulin resistance, leading to hyperglycemia. Hyperglycemia can result from increased hepatic glucose production. Excessive glucocorticoid levels are correlated with obesity and hyperglycemia. Elevated glucocorticoid levels are observed in diabetic humans and animal models of type 2 diabetes. While the peripheral effects of glucocorticoids are well established, the goal of the current study is to observe the direct effect of glucocorticoids in the brain in the regulation of hepatic glucose production and plasma glucose levels.

Stereotaxic mediobasal hypothalamus (MBH)-cannulated and vascular-catheterized Sprague Dawley rats underwent a glucoregulatory experiment in response to brain treatment with direct infusion of glucocorticoids into the MBH region. Intravenous glucose tolerance tests assess glucose handling and pancreatic basal insulin euglycemic clamps assess glucose production and utilization. An infusion of glucocorticoids into the MBH further increases plasma glucose levels in response to a glucose tolerance test and stimulates hepatic glucose production compared to vehicle infused rats. This metabolic effect of glucocorticoids is mediated by glucocorticoid receptors in the MBH since pharmacological inhibition of these receptors in the MBH blocks the gluco-stimulatory effect of glucocorticoids.

This study provides groundwork for our subsequent studies to explore how direct brain action of glucocorticoids, or inhibition of this action, plays a role in high fat diet-induced obese and diabetic animal models. Novel therapeutic targets in the brain can be designed to improve glucose metabolism to help treat metabolic disease.



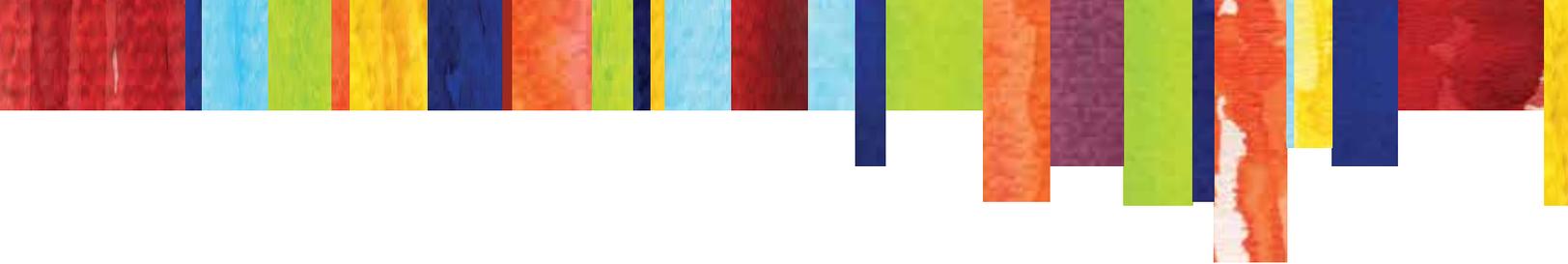
# P54. Solving a genetic mystery of a novel immune disorder in the NF- $\kappa$ B pathway

Area(s) of study: Natural Sciences & Engineering, Health Sciences

**Min Ku Kang\*, Allison Lewis, Oana Caluseriu**

FACULTY OF SCIENCE

Severe combined immunodeficiencies are genetic disorders marked by complex symptoms and high mortality. We are exploring a new immunodeficiency disorder in a First Nation family in which comprehensive clinical tests have failed to pinpoint the cause. Using genome sequencing, we identified a candidate gene, a crucial molecule activating the NF- $\kappa$ B pathway. Upon infection, this pathway activates various immune genes. We believe this pathway is impaired in the patient as we have observed that patient derived fibroblast cells have decreased NF- $\kappa$ B pathway activation and lower protein level of the candidate gene compared to controls (carrier and wild type sisters' fibroblasts). We then addressed the following: are the candidate gene and other key players in the NF- $\kappa$ B pathway downregulated transcriptionally due to the mutation? Are target genes not activated in patient cells? We used qPCR to measure activity levels of selected key players in the NF- $\kappa$ B pathway and compare this between patient cells and controls. We found that whether stimulated or not, there were no significant differences in the transcript levels of the candidate gene and the selected players indicating they are not downregulated transcriptionally. The target genes of the pathway involved in immunity were upregulated significantly after stimulation in the controls but not in patient cells. This is the first time we show the functional consequence of our mutation is at a post-transcriptional level which results in perturbed activation of target genes and provide further evidence for how the mutation is contributing to the pathogenesis of this novel human disorder.



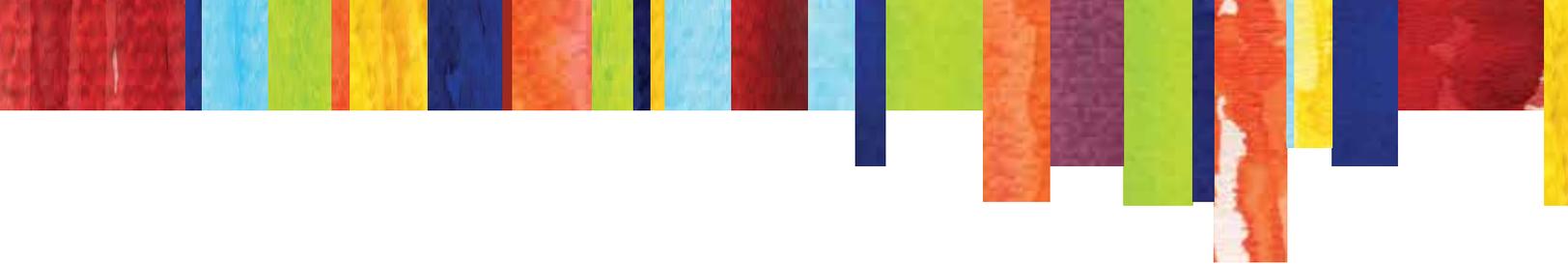
## P55. Apelin-13 and Apelin-17 analogues incorporating L-homoarginine and L-cyclohexylalanine: synthesis and resistance to ACE-2 and NEP

Area(s) of study: Natural Sciences & Engineering, Health Sciences

**Kleinberg Fernandez\*, Conrad Fischer, John C. Vederas**

FACULTY OF SCIENCE

Apelin is an important endogenous peptide hormone that has shown to contribute to various physiological and pathological effects, especially in the cardiovascular system. Apelin, a 77-amino acid prepropeptide, is processed into three co-existing isoforms: pyr-1-apelin-13, apelin-17, and apelin-36. However, previous studies have shown that apelin isoforms are metabolized by various proteases, including angiotensin converting enzyme (ACE-2) and neprilysin (NEP), through proteolytic degradation, leading to a plasma half-life of less than 5 minutes. The current study is looking at the metabolic stabilization of apelin peptides from proteolytic degradation, through amino acid modifications. A recently published crystal structure of the apelin receptor gives rise to the question if these substrate analogues act as agonists or antagonists, while maintaining reactivity. Within this project, six apelin analogues were synthesized incorporating L-cyclohexylalanine (L-Cha) and L-homoarginine (L-hAr). The ultimate goals for these novel apelin analogues include testing and engineering their resistance towards ACE-2 and NEP proteases, testing plasma stability over time, and submitting lead structures for animal blood pressure tests in order to evaluate their beneficial cardiovascular potential.



# P56. A Protein-Triggered DNAzyme Motor Enabling Operation On Live Cells

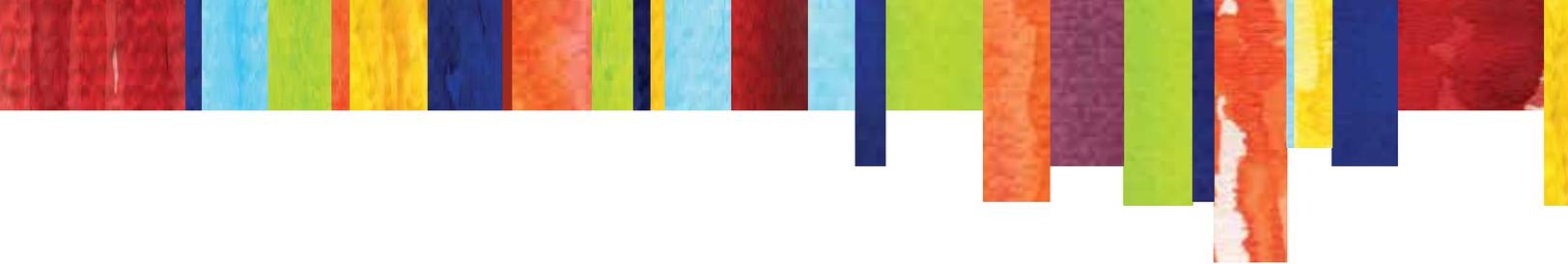
Area(s) of study:

Natural Sciences & Engineering, Health Sciences, Other/Interdisciplinary

**Ami Vora\*, Divya Shah, Jing Yang Xu, Hongquan Zhang**

FACULTY OF MEDICINE & DENTISTRY

The use of nanoparticles in biomedical research has become a new avenue for improvement of cancer detection and treatment. Methods with high sensitivity and ease of use are desirable for early cancer detection. We hypothesize that construction of a DNAzyme motor enabling operation on live cancer cells can achieve amplified detection of cancer cells without the need for separation. The DNAzyme motor system consists of two main components: a DNAzyme linked to an affinity ligand and a nano-/micro particle bound to a second affinity ligand and the substrate for the DNAzyme. The nano-/micro particle serves as a scaffold to construct three-dimensional DNA tracks of substrate molecules. Binding of a specific target molecule on cells to the two ligands induces hybridization between the DNAzyme and its substrate on the DNA track. This hybridization initiates the cleavage of the substrate and autonomous movement of the DNAzyme along the AuNP. Each moving step restores the fluorescence of a dye molecule on the DNA track, enabling amplified detection of cancer cells. We have constructed three DNAzyme motor systems using quantum dots, gold nanoparticles, and magnetic beads as scaffolds. The DNAzyme motor system using gold nanoparticles led to the highest signal and is most suitable for operation on live cells. We have demonstrated the feasibility of construction of a DNAzyme motor enabling amplified detection of surface molecules of live cells. Potential applications of this motor system include molecular sensing, cell imaging, molecular interaction monitoring, and controlled delivery and release of therapeutics.



# P57. HIV and STI Testing Barriers and Preferences among Alberta LGBTQ Men—a Representative Strategy via Community-Based Research

Area(s) of study: Other/Interdisciplinary

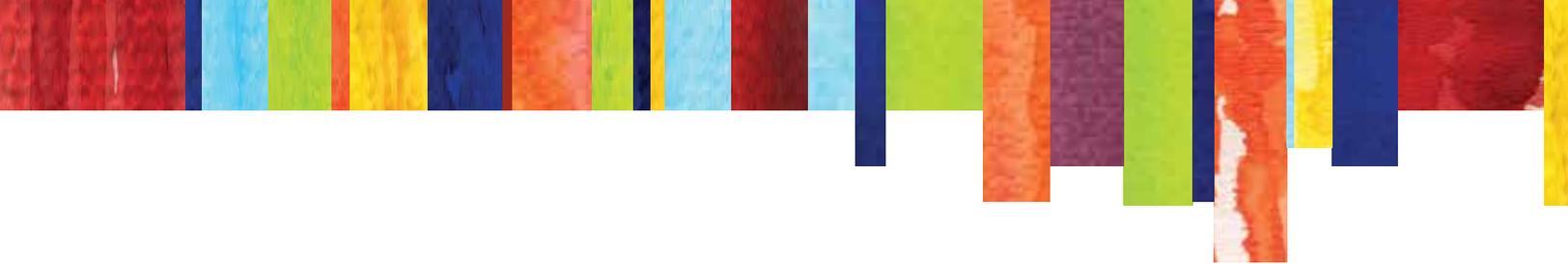
**Michael Taylor\*, Brook Biggin, Derek Fehr, Henry Wiebe, Kai Homer** | FACULTY OF MEDICINE & DENTISTRY

**BACKGROUND:** Alberta is developing a new Sexually Transmitted and Bloodborne Infections Strategy, led by Alberta Health Services (AHS) with the participation of a broad range of community stakeholders. In order to more effectively address the specific health determinants, needs, and outcomes of gay, bisexual, trans, and queer (GBTQ) men, AHS has engaged the Edmonton Men’s Health Collective (EMHC) to provide expertise, and to conduct community consultation.

**METHODOLOGY:** An online survey of Alberta’s LGBTQ men (n=368) was conducted using social media as the primary means of promotion. Topics included: sexual health knowledge and education, condom usage, substance use, injection drug use, partner notification, HIV/STI testing and treatment, post-exposure prophylaxis (PEP), and HIV care.

**RESULTS:** 45.4% (n=167) indicated ‘testing hours’ as the most important factor relative to STI and HIV testing access, with ‘inconvenient testing hours’ being selected most as a barrier to accessing both STI testing (55.4%, n=204) and HIV testing (52.4%, n=193); ‘weekday evenings’ (79.3%, n=292) and ‘weekend afternoons’ (74.2%, n=273) were most preferred to access testing. 83.4% (n=307) expressed likelihood to access rapid HIV testing if made available; 79.3% (n=292) also selected standard HIV and STI testing. If made available, STI clinics (90.2%, n=332) and LGBTQ specialized clinics (85.3%, n=314) were most frequently chosen to access testing. Among those who have a family doctor (n=224), 81.7% (n=183) indicated that they had come out to their provider.

**CONCLUSION:** Alberta’s current HIV/STI testing framework is not responsive to the preferences and primary barriers experienced by LGBTQ men; continued consultation and collaboration with the community must persist in order to address gaps in care and improve access to HIV/STI testing.

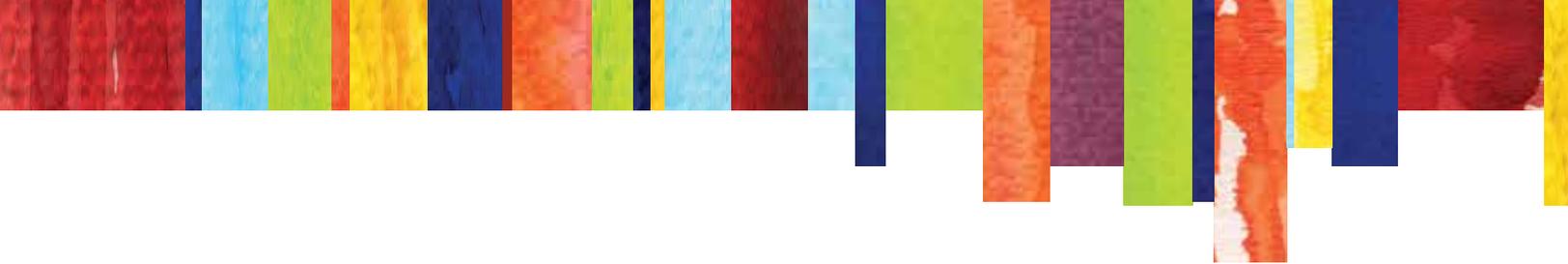


## P58. Does the loss of *Cecr2* result in cleft palate in mice?

Area(s) of study: Other/Interdisciplinary

**Nikki Chopra** | FACULTY OF SCIENCE

Cat Eye Syndrome is a rare chromosomal disorder that presents as a variable pattern of inborn abnormalities including: coloboma, skin tags or pits near the ear, defects of the anus, heart and kidney, mild to moderate intellectual disabilities, and cleft palate. This disorder is usually associated with a triplication of a segment of chromosome 22 that contains *CECR2*, a gene that encodes a chromatin remodeling protein. It is assumed that Cat Eye Syndrome results from an overexpression of *CECR2*. We obtained a mouse with a mutation that knocks out the orthologous *Cecr2* gene, resulting in coloboma. Here we hypothesize that overexpression and underexpression of *Cecr2* result in similar phenotypes because the change in gene dosage is affecting the same tissues. In order to test this hypothesis, we're looking for cleft palate in mice that have lost their *Cecr2* function. By determining which developmental processes are disrupted by a loss of *Cecr2*, we can gain a better understanding of the function of *Cecr2*.

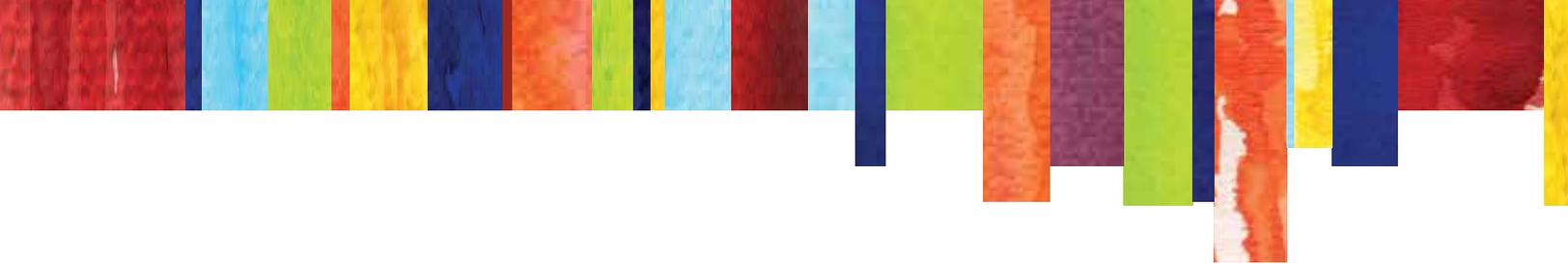


# P59. Exploring the Ethics of the Deep Web

Area(s) of study: Other/Interdisciplinary

**Mohamad Jamaledine, Vishal Kohli** | FACULTY OF SCIENCE

The purpose of the project is to analyze the uses of the deep web against the surface web, and explore the unethical side of the deep web. There is a great deal of important information in the deep web, such as important government documents, subscription based content, and unfortunately, illegal content. Furthermore, light is shed on one important part of the deep web, the Dark Web. The dark web brings upon many ethical concerns as it is crowded with child pornography websites, scams, and black markets and is home to the Silk Road. The currency of choice on the deep web is Bitcoin, which offers its own set of perks to the user. Lastly, the question of future existence of deep web is discussed along with exploring options that will not only help make the Dark Web a safer and legal place in the future.

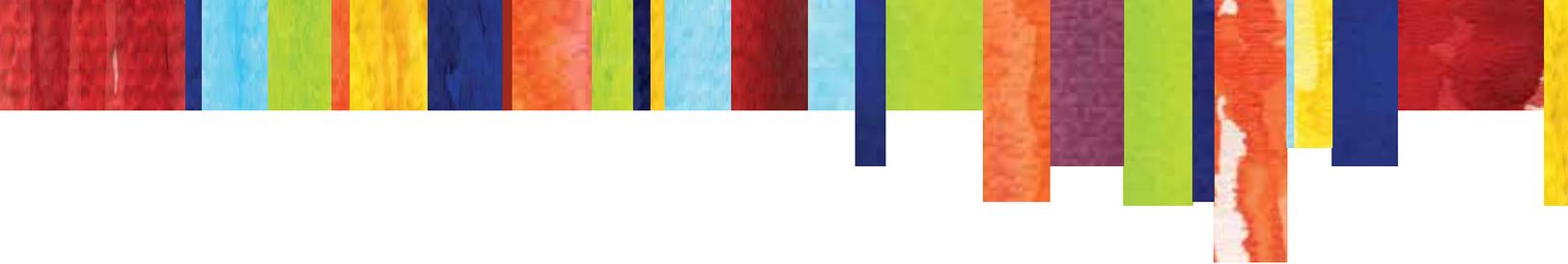


# P60. Physicians as Teachers and Lifelong Learners: The Roles of Basic Psychological Need Satisfaction and Involvement in Clinical Teaching

Area(s) of study: Other/Interdisciplinary

**Mao Ding\***, **Oksana Babenko**, **Sudha Koppula**, **Anna Oswald**,  
**Jonathon White** | FACULTY OF SCIENCE

Physicians need to constantly update their knowledge and skills in response to patients' evolving needs and new advancements in the medical field. While published research indicates that physician lifelong learning relates to career satisfaction and various professional accomplishments, little is known about what factors contribute to physician lifelong learning. This study was designed to determine whether psychological need satisfaction and involvement in clinical teaching were associated with enhanced lifelong learning among practicing physicians. Quantitative data were collected from physicians in Canada using an online survey. The survey contained validated scales of physician lifelong learning and psychological need satisfaction, measures of clinical teaching involvement and enjoyment, stress level, burnout frequency, and life satisfaction. Exploratory factor analysis, analysis of covariance, and correlational analysis were performed. A total of 202 physicians practicing various medical specialties participated in the survey (66% were female; 48% were under 40 years old). Overall, participants reported moderately high levels of lifelong learning, psychological need satisfaction, teaching enjoyment, and life satisfaction. Most participants reported being involved in clinical teaching. Both psychological need satisfaction and involvement in clinical teaching were significantly associated with greater physician lifelong learning. In line with previously published research, physician lifelong learning was positively and significantly correlated with life satisfaction and enjoyment of teaching among physicians in this study. Taken together, the results suggest that fulfilling basic psychological needs and supporting physicians in their roles as clinical teachers are likely to enhance physicians' growth as lifelong learners.



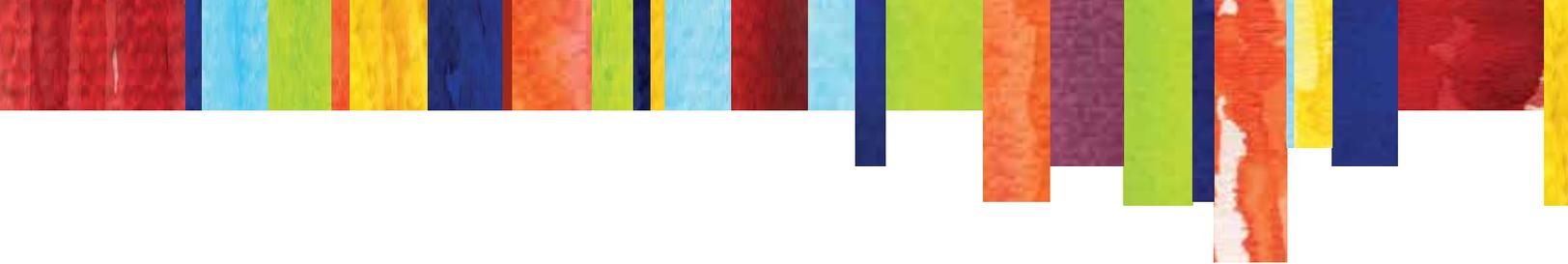
# P61. Disordered Gambling & Bankruptcy Law: Research-Informed Practice for Insolvency Professionals

Area(s) of study: Other/Interdisciplinary

**Arooj Shah\*, Anna Lund** | FACULTY OF LAW

A central goal of Canada's personal bankruptcy system is to rehabilitate over-indebted individuals. The bankruptcy system seeks to achieve this goal by providing individuals with a legal form of debt forgiveness, but also by subjecting debtors to mandatory financial counselling and therapeutic interventions. Problem gamblers are more likely to declare bankruptcy than other Canadians, and when they do, the insolvency professionals who implement bankruptcy law struggle to develop appropriate responses. The counselling and therapeutic interventions currently employed by insolvency professionals are not consistently reflective of the research on disordered gambling. This poster presentation reports on part of a larger project, undertaken in conjunction with Professor Anna Lund of the University of Alberta, Faculty of Law, that seeks to synthesize and translate existing research on problem gambling for use by insolvency professionals. This poster presentation will synthesize research on providing financial counselling to disordered gamblers and translate it into the bankruptcy context. This synthesis and translation exercise seeks to address two questions:

1. What financial indicators can insolvency professional use to identify when a bankrupt individual may have a gambling problem, and,
2. What financial interventions can insolvency professionals implement during the bankruptcy process to help individuals overcome their gambling problem?

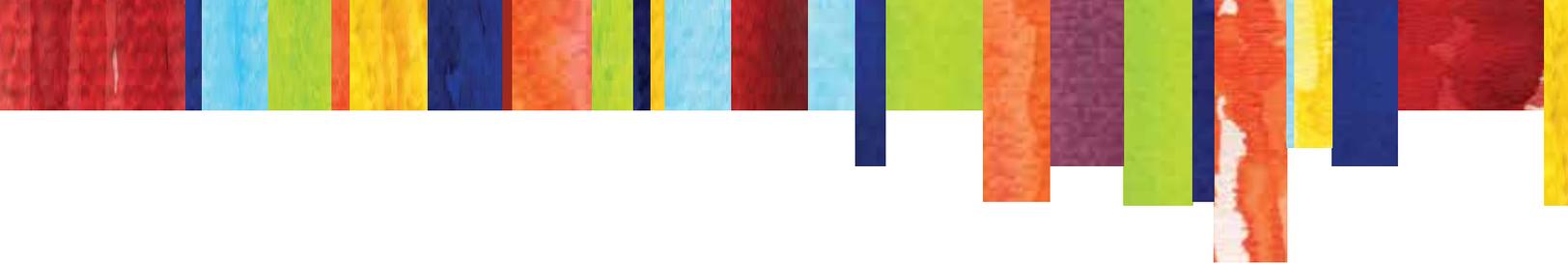


## **P62. Systematic review: Stimulant medications and induced suicidality in youth with ADHD**

Area(s) of study: Other/Interdisciplinary

**Feodor Poukhovski-Sheremetyev, BA Candidate (2019)\*,  
Karen Wang, MEd, MD, FRCPC, Nicholas H Neufeld, MD, MSc,  
Sefi Kronenberg, MD, PhD | CAMPUS SAINT-JEAN**

In 2015, Health Canada issued a warning linking stimulant medications with suicidal thoughts and behaviour (suicidality) in youth with ADHD. To the best of our knowledge, there are no peer-reviewed studies presenting such a correlation, and it is possible that the warning is based primarily on anecdotal evidence. In order to correct this gap in psychopharmacological knowledge, we are conducting the first systematic review of research associating suicidality, stimulants, and ADHD. Our preliminary findings have been unable to show a statistically significant association between pediatric suicidality and stimulant medications. That said, two major outcomes are still possible: the discovery of a positive correlation, or no detectable signal. The contribution of this study would be substantial in both cases, either supporting or challenging Health Canada's statements. Accurate pharmacological information is essential for effective treatment and minimizing risks to patients.



# P63. Land-based Learning in Teetl'it Zheh: A University-Community Bush Camp Partnership

Area(s) of study: Other/Interdisciplinary

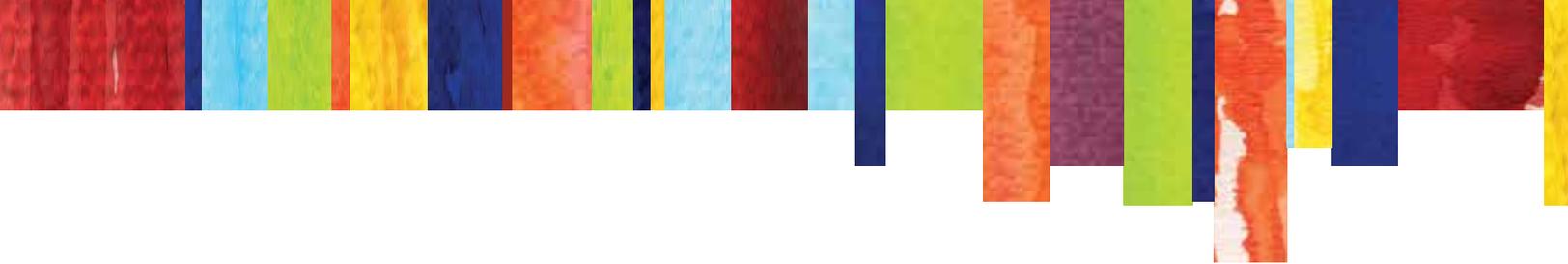
**Shayla Snowshoe** | FACULTY OF NATIVE STUDIES

This project addresses and analyzes Teetl'it Gwich'in knowledge in terms of an important place and place names, with the help and guidance of a Teetl'it Gwich'in elder from Fort McPherson, Northwest Territories.

The research was conducted by recording oral stories told by a Teetl'it Gwich'in Elder about the place traditionally referred to as "Tr'inalaii". Tr'inalaii translates to "The water is flowing out" and is located approximately 30 miles up the Peel River. Tr'inalaii was once the home of respected Teetl'it Gwich'in elders Edward Snowshoe, Ronnie Pascal and William Vittrekwa, along with their families.

The importance behind Tr'inalaii is entailed through the stories shared by the Teetl'it Gwich'in elder who was born and raised there along the banks of the Peel River. These recordings and research will be shared and presented through the Gwich'in Place Names Atlas website where the traditional Teetl't Gwich'in name will be added to a map of Gwich'in country, as well as through poster form. The poster will showcase the beauty and pristine nature of Tr'inalaii through photography and story sharing.

The concept of utilizing traditional place names is an important aspect of decolonization because it carries forward the traditional name and history of the important place. The Gwich'in language is endangered and can soon be lost. It is through outlets like the documentation of traditional Gwich'in place names that the Gwich'in language, history and culture will be preserved, which is essentially the ultimate goal.

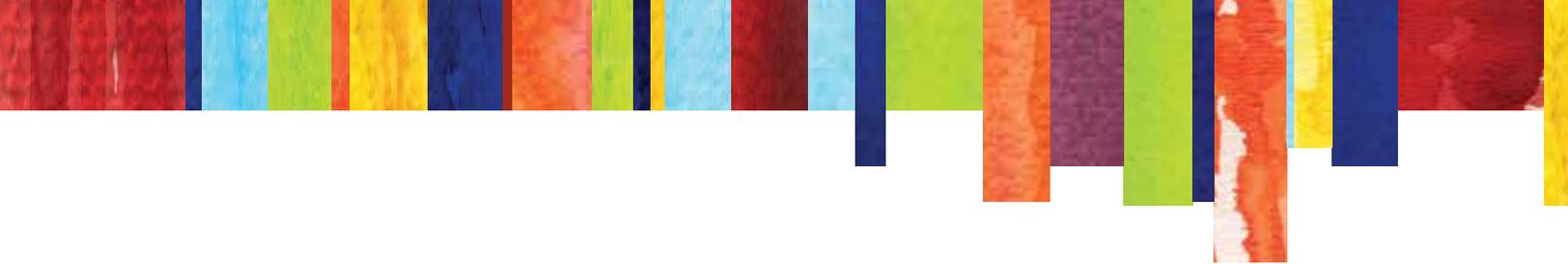


# P64. Does the Type and Presence of Primary Care in Alberta Influence Asthma Control and Severity? An Alberta Wide Survey

Area(s) of study: Other/Interdisciplinary

**Joel Agarwal\*, Monette Dimitrov, Hailey Hitchings, Dr. Maeve Smith, Kerri Mackay, Jillian Peters, Dr. Carolyn Ross, Dr. Alan Kaplan, Dr. Donald Cockcroft, Dr. Dilini Vethanayagam** | FACULTY OF SCIENCE

Introduction: Asthma is a chronic disease of the airways. Primary Care Practitioners (PCPs) are integral to care coordination, enhanced through development of a strong patient-physician relationship. Excellent continuity of care (COC) correlates with lower urgent care visits, complemented by Primary Care Networks (PCNs). Recent work notes that 40% of Albertans do not have a COC model for primary care. We aimed to evaluate impact of PCPs on asthma control in Alberta. Methods: Population-based recruitment of adults were approached through various community venues. Those with confirmed asthma by self-report and willing to participate were asked to complete a web-based survey including the Asthma Control Questionnaire (ACQ-5), Asthma Control Test (ACT), and quality of life through the mini-Asthma Quality of Life Questionnaire (mini-AQLQ), as well as information collected on postal codes, health care utilization and primary care structure. Results: Over 1000 individuals were approached, 51 had asthma (35 surveys had complete information including postal codes): 21 from Northern Alberta (N-AB) and 14 from Southern Alberta (S-AB). Most had a PCP (20 N-AB; 12 S-AB) but few indicated regular visits with their PCP (17 N-AB; 7 S-AB). ACT indicated poor control for 5 from N-AB (24%) and 6 S-AB (43%); and ACQ-5 in 4 from N-AB (23%) and 7 S-AB (50%). Average lifetime emergency visits related to asthma were 2.23 in N-AB and 4.85 S-AB. Intensive care related to asthma did not occur in any from N-AB but in 3 from S-AB. In N-AB, 6 subjects' PCP were linked with PCN. Conclusions: Participants having PCPs less frequently utilized this venue in S-AB, along with higher ICU visits, more with uncontrolled asthma, and less optimal quality of life scores than N-AB. COC access in S-AB needs further study, including rural and urban differences. Knowledge about PCNs was also poor, potentially indicating lack of patient engagement of PCNs in chronic disease management.

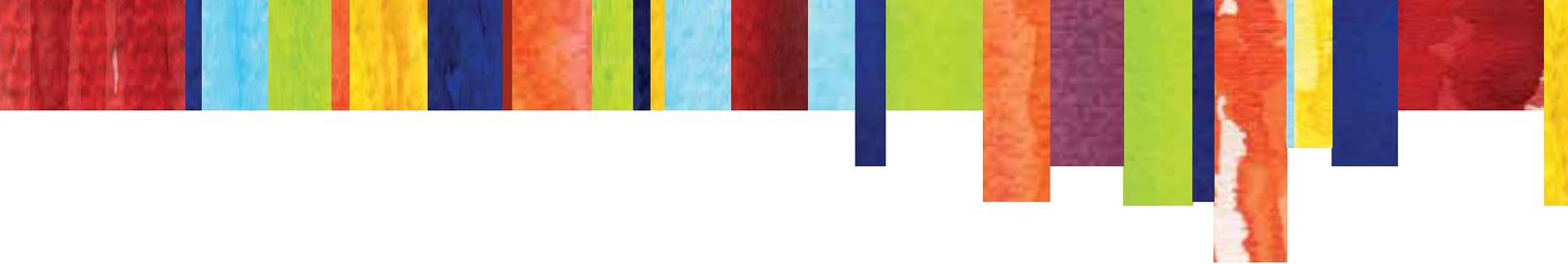


## P65. ChinaAlive: Integrating Cultural Learning and Gaming

Area(s) of study: Other/Interdisciplinary

**Jiwon You\***, **Nikita Yevtukh\*** | FACULTY OF ARTS

Digital game-based learning (DGBL), using video game as a tool, has received much attention as a new teaching method, especially in STEM fields. However, its effectiveness in instruction in the humanities teaching is still being debated. Our team is creating an educational video game, ChinaAlive, for local elementary students and testing it to determine if it can be effective in conveying culture. Teaching different cultures is important not only because it teaches children to be accepting of diverse cultures, but it also reinforces Canada's multiculturalism. The initial testing was done in 2017 with undergraduate participants. The results were positive, suggesting that our game can be an effective teaching tool in cultural studies. We have continued developing our game to enhance the sense of culture conveyed. We are also investigating whether the novelty of our game, and DGBL in general, can have a positive impact on the field of education. ChinaAlive uses various methods to let students directly experience the target culture. Most notably, we use folklore as the main tool for storytelling and delivering information. Folklore not only conveys a culture's factual information, but also its "unofficial" culture, such as implicit social rules and beliefs that are often not taught directly in traditional classrooms. Using folklore, along with other assets, we created a fantasy world where students can vicariously live in the target culture and take part in active learning. Our study's results will help lay a foundation for building effective DGBL and expanding it into all areas of instruction.

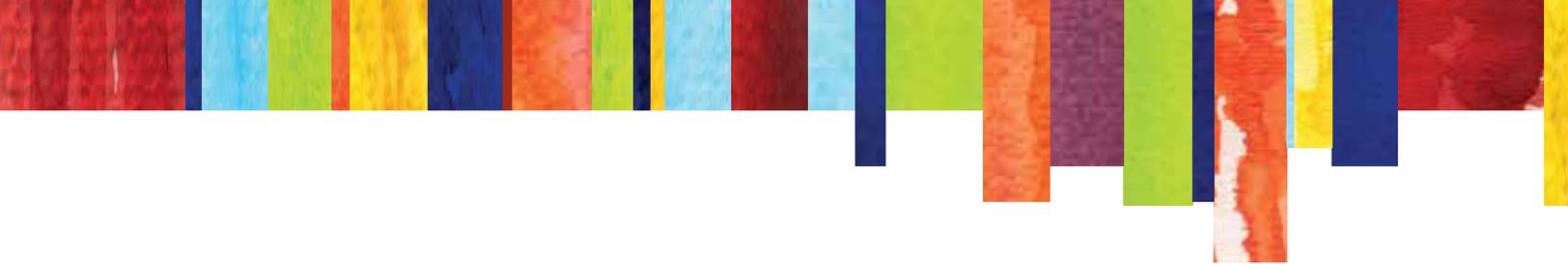


# P66. The Bloodroot Collective

Area(s) of study: Social Sciences & Humanities

**Amelia Deneka** | FACULTY OF SCIENCE

The Bloodroot Collective is a feminist-lesbian work collective that grew out of a women's cooperative exchange. The collective opened a restaurant-bookstore in 1977 in Bridgeport, Connecticut, and has published several vegetarian cookbooks. The collective is named after a wildflower that grows individual flowers from rhizomes to symbolize the simultaneous connection and independence of the members. The Bloodroot Collective seeks to embody radical feminist-lesbian ethics in every facet of life. However, the collective's version of feminism is gender-essentialist, semi-separatist, and based on a white middle-class experience. For my History of Feminist Thought (WGS 301) class I created a research poster exploring the history, politics, and accomplishments of the Bloodroot Collective. I conclude that despite some drawbacks, the Collective is significant to the history of feminist thought because it strives to create a feminist community space for lesbians and women in general.

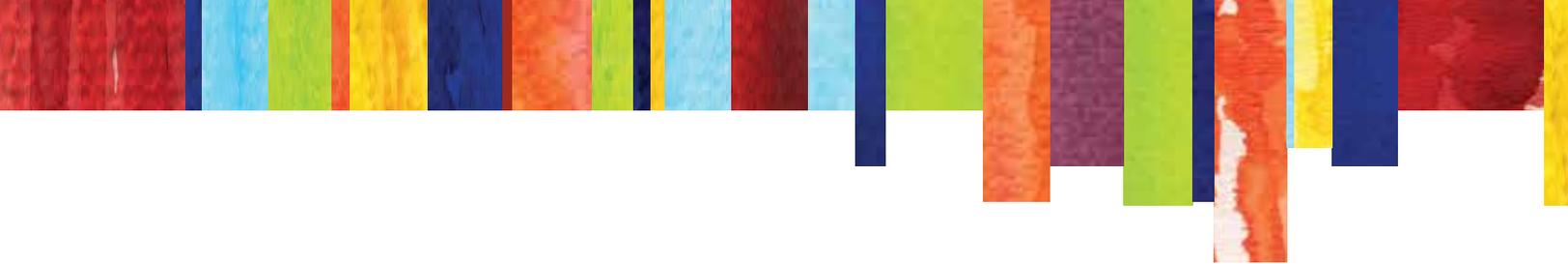


# P67. The Sword, the Grail, and the City of Glass: King Arthur the Bright and Shining

Area(s) of study: Social Sciences & Humanities

**Laura McLean\*** | FACULTY OF ARTS

The connection between King Arthur in Welsh writing and in Latin writing (and Latin influenced writing such as the Romance languages) on the legend of the Holy Grail, Sword in the Stone, and Avalon, is more extensive than often discussed. This research discusses the Greco-Roman epithet of “shining” that follows King Arthur throughout his legends and the mythological parallels between the legends. The research compares the Celtic (Welsh and Irish) and Italic (Latin, French) and Germanic (English) legends of King Arthur (both in the original language and in translation). The study also compares works of different modern scholars and the discourse surrounding the legends as well as studies legends on a linguistic level using the methods of historical linguistics. Throughout the legends, there is a connection to other Indo-European myths, not just the Christian legend, in three specific areas (sword, grail, and glass city) and Greco-Roman parallels as seen in the variations of the legend in the different languages. This demonstrates the vast influence on Roman Britain and the Celtic region of Europe from other cultures, including the Sarmatians, an Indo-Iranian tribe. This creates a legend much more diverse than simply based off the Christian legends.



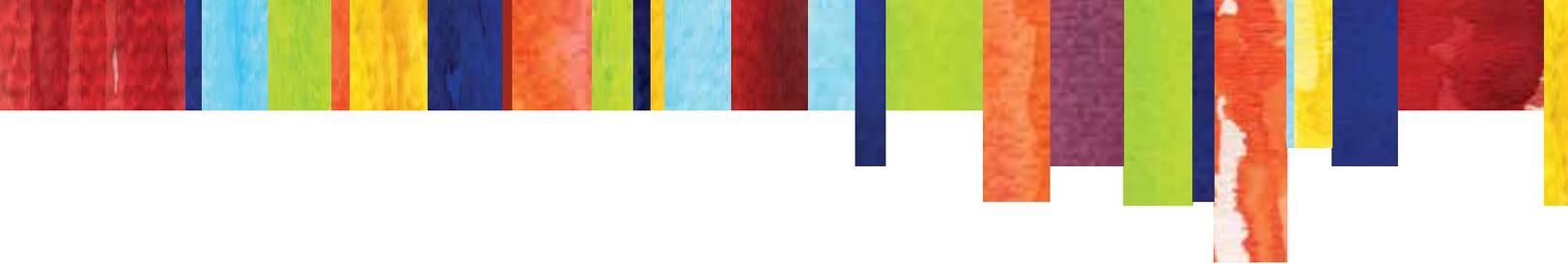
# P68. Do IQ tests really test intelligence?

Area(s) of study: Social Sciences & Humanities

**Lynsey Stewart** | FACULTY OF ARTS

Intelligence, it is a human quality that is not as simple to measure as we have been lead to believe. The idea that humans could be quantified by their intelligence is drawn from early works of Darwin and Galton. Galton took Darwin's "Origin of a species" and converted these ideals to form the foundation of eugenics. Eugenics became an origin point for class and race based discrimination. Galton and other researchers believed that intelligence was not based on experience or education, but rather was genetic, and was diminished in other races. This lead to the invention of intelligence testing, first for students and eventually for immigration and army recruitment.

However, these early tests failed to compensate for education, cultural bias, and economic differences, so to do today's tests. Modern sources like "The Bell Curve" continue to foster the idea that some races have an innate intelligence, while others have a reduced capacity. The racial aspects of test are also difficult to determine, since the "cultural specificity" of intelligence makes IQ tests biased toward the environments in which they were developed—namely white, Western society. The application of the same test among different communities would fail to recognize the different cultural values that shape what each community values as intelligent behavior. Going even further, given the IQ test's history of being used to further racially motivated beliefs about what different groups of people are capable of, some researchers say such tests cannot objectively measure an individual's intelligence at all.



# P69. What Works in an After-School Homework Club for Newcomers?

Area(s) of study: Social Sciences & Humanities

**Katelyn Moran\*, Sarah Nguyen\*,  
Kevin Rwigamba, Dr. David Peacock**

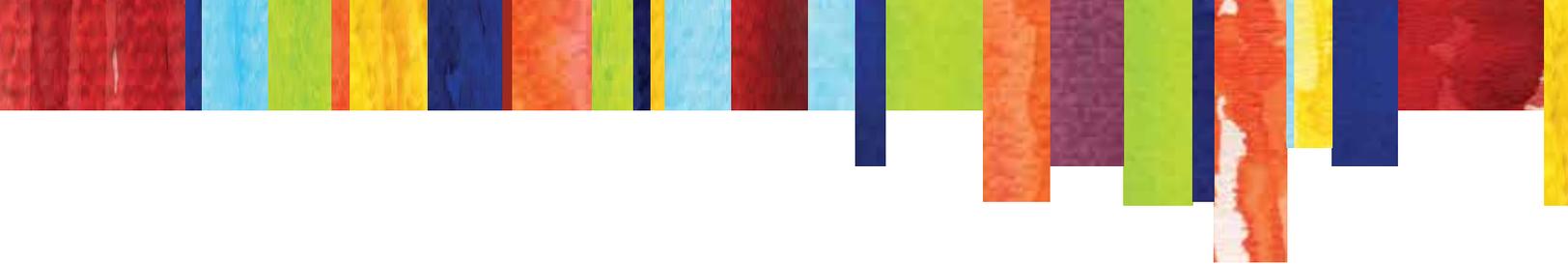
FACULTY OF AGRICULTURAL, LIFE & ENVIRONMENTAL SCIENCES

Background: Newcomers to Canada are resilient individuals who may face social, academic, and literacy challenges when transitioning to the Edmonton Public School (EPS) system. To assist with these challenges, the Edmonton Mennonite Centre for Newcomers (EMCN) offers an after-school homework club for newcomer families. To share program knowledge and experiences, EMCN in partnership with Community Service-Learning (CSL) conducted an appreciative inquiry into what works well at this homework club for newcomers.

Methods: Students in CSL 350, an 'Introduction to Community-Based Research' conducted face-to-face interviews, ethnographic observations, and focus groups. 31 EPS and EMCN staff, volunteers, and parents participated. Data was transcribed and analyzed using thematic analysis. Course-based ethics approval was obtained.

Results: The homework club works well because it helped newcomers with their transition by: i) facilitating communication between families and the school; ii) creating a safe space for students; iii) supporting students' social and emotional needs; iv) assisting with academic and English literacy skills development; v) resource-sharing; and vi) providing mentorship to students. These outcomes were enabled through relationships between the newcomer families, school, and EMCN.

Conclusion: The homework club connected newcomers to the Edmonton community. It was successful because it assisted with cultural adjustment, nurtured families' needs, and drew upon the strengths of various networks. The knowledge and experiences shared through this research may offer helpful information to external practitioners working with newcomers or in the field of after-school programs.

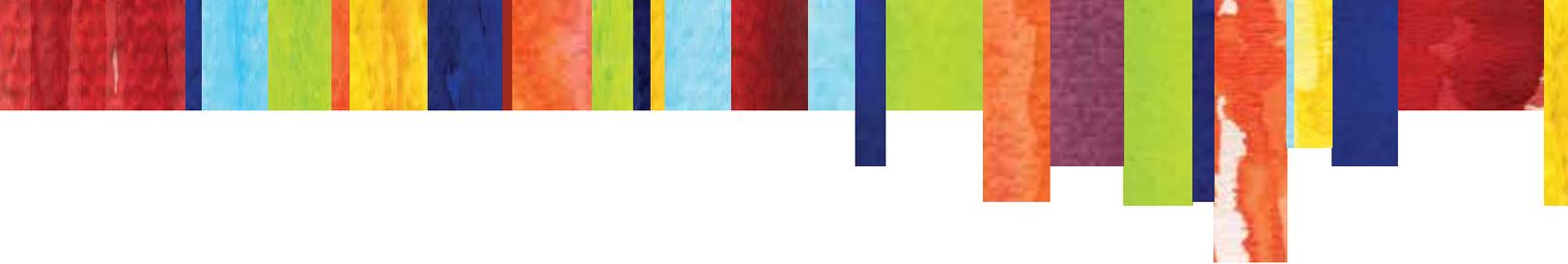


# P70. The Complexity of Translating Sacred Texts

Area(s) of study: Social Sciences & Humanities

**Niabi Kapoor** | FACULTY OF ARTS

Translation has not always been considered a legitimate profession or field of work, and still lacks credibility today. The complexity of a translator's job has been taken for granted multiple times, as many do not consider what the translation process actually is or how complicated it can be, specifically when the translated text is religious or controversial. There are always consequences associated with any translation, like the delivery of misinformation or miscommunication. However, a "mistranslation" of a sacred text presents far more serious ramifications, as it can be deemed disrespectful or sacrilegious and may even present fatal consequences for the translator. Historically, multiple translators have been involved in risky or even tragic events, all in relation to their work. As translation students, we have been taught that a translator's primary responsibility is to ensure that the meaning and significance of the source text is communicated clearly and effectively towards the target audience. However, the translation of a sacred text requires a re-evaluation of priorities in that translators need to be more faithful to the source text rather than the target audience, for personal safety, if anything else. This research will explore why a translator must remain just as faithful to the source text as to the target text when translating sacred works, and will emphasize the relevancy of this statement by exploring the implications of mistranslation. This research will discuss the complexities of translation, specifically surrounding the translation of religious texts, through an analysis of the work of various translators and an exploration of the serious and even lethal ramifications that translators have endured as a result of their work.

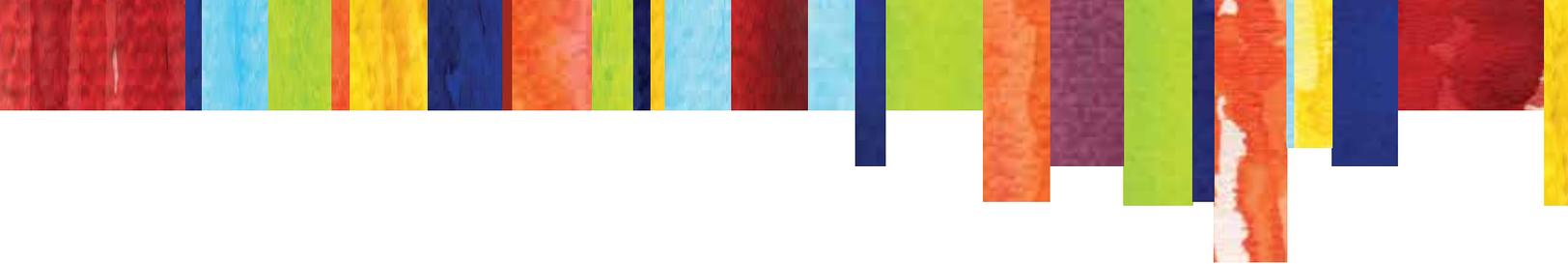


# P71. The Relationship Between Self-Government and Wellness in Indigenous communities

Area(s) of study: Social Sciences & Humanities

**Marina Saporito\*** | FACULTY OF NATIVE STUDIES

Across Canada, the implementation of self-government within Indigenous communities is seen as a method to move forward and create a different relationship between Canada and Indigenous communities. For this study, the influence, both positive and negative, that self-government has had within communities is evaluated to see whether or not community wellness improved. To conduct this research, a review of self-government agreements, community research, and other academic research was conducted. With the exception of the Yukon and Nisga'a, not much research within Canada has focused on the result of self-governance so much of the information was extrapolated from nations across the globe.



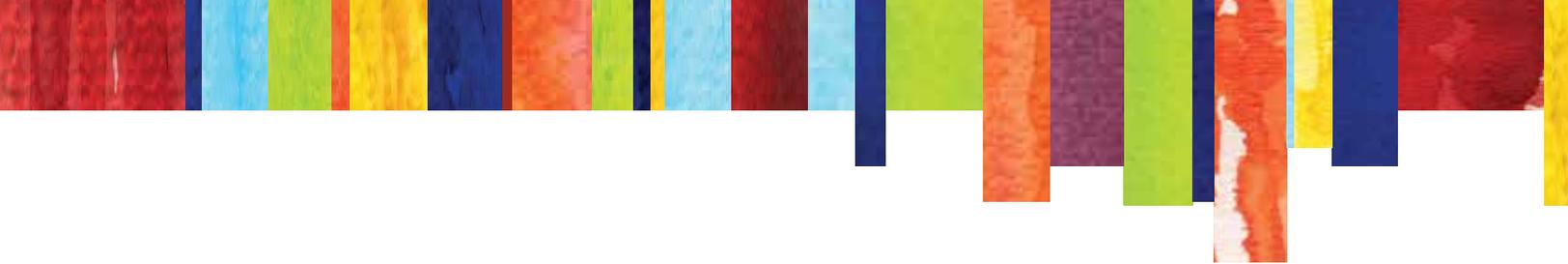
# P72. Mapping the Journey of Creating an Evaluation Framework for Pregnancy Pathways

Area(s) of study: Social Sciences & Humanities

**Jessica Krahn\*, Dr. Vera Caine** | FACULTY OF NURSING

Each year in Edmonton approximately 100 pregnant women are homeless or unstably housed.

Pregnancy Pathways is a transitional and supportive housing program for pregnant or early parenting women experiencing homelessness that aims to improve their mental and physical well-being. Currently, there is little evidence to establish which housing models and program principles provide relevant and meaningful outcomes. In order to assess the processes and outcomes that underpin Pregnancy Pathways, an evaluation framework is under development. As one of the first steps, we conducted a literature search to identify evaluation tools being used in similar programs and tools measuring outcomes related to Pregnancy Pathways' foundational principles. Identified tools were then assessed to determine their quality and fit with the program. A final list of tools was presented to women with lived experiences of being pregnant or early parenting while homeless, along with service providers working with this population to gather input on the tools' acceptability and utility. Ten tools measuring outcomes relevant to the program's foundational principles, clinical care, and to stakeholder's goals were included. None of the identified evaluation tools reflected Indigenous perspectives. While the development of the Pregnancy Pathways program along with its evaluation framework will fill significant gaps in service provision in Edmonton and the knowledge base for intervening with this specific population, this process has been challenging. Given that the majority of women are Indigenous, future directions include working with Indigenous community members, including elders, to frame the evaluation to reflect Indigenous values and ways of knowing.



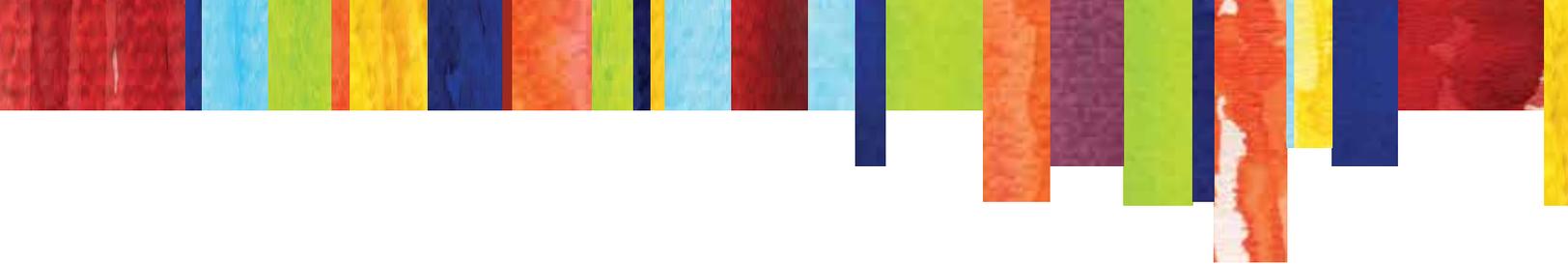
# P73. Balancing Lives and Mental Health

Area(s) of study: Social Sciences & Humanities

**Helen Vallianatos, Amanda Ong Cai Hong, Lauren Hall,  
Usman Farooq\*, Amadeu Shigeo de Almeida\***

ALBERTA SCHOOL OF BUSINESS

In an ongoing research project we have found that important factors negatively affecting student mental health is the ability to balance personal life, school, and manage expectations. Focus group interviews with different groups of students across campuses were conducted by the faculty investigator. Undergraduate research assistants participated in the data analysis of these interviews through first transcribing the audio recordings, then coding the transcripts. Coding is the first step in data analysis, where codes are assigned to sections of text. Their definitions are determined based on context and are not the same as typical definitions of the word or phrase. The codes when examined together allude to a greater theme which provides insight about the issues. We have found that a lack of balance in students' lives leads to feelings of being overwhelmed. A loss of balance in students' lives stems from the pressure to perform well; these pressures emerge from both internal and external expectations placed on students. Students then begin to prioritize certain aspects of their lives over others to meet these expectations. Mental unwellness can arise when student underestimate the impact and benefits of activities such as healthy eating, exercise, socializing, and being aware of their own mental state. These activities are the first to be cut out of their lives to balance academic work and extracurricular involvement. The prioritization placed on academic work is found to have come from not just expectations but university culture and norms. Because this is an ongoing project it is hard to identify all of the root causes of negative mental health for students. We have however, identified that many factors come together to create a cyclical effect on students lives and the importance of seeking help.

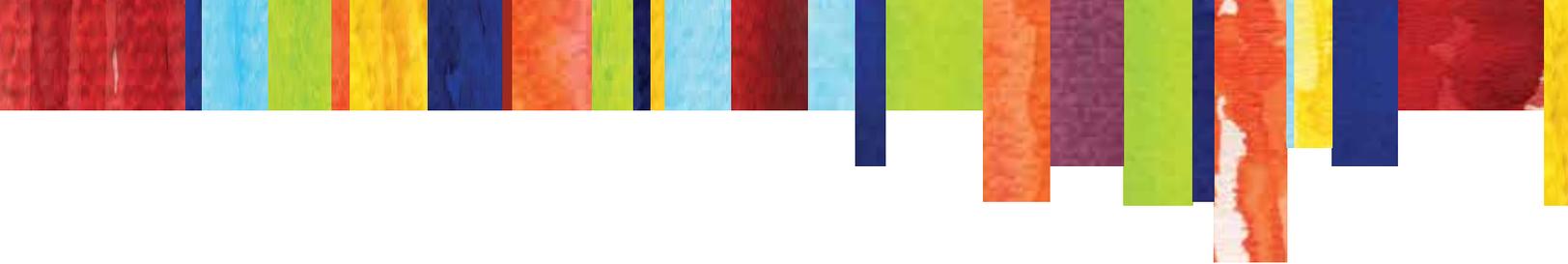


# P74. Perceptions of Trustworthiness in Leaders: The Role of Uncertainty and Prototypicality

Area(s) of study: Social Sciences & Humanities

**Meghan Hodgson** | FACULTY OF ARTS

The perception of a leader's trustworthiness is impacted by feelings of uncertainty within the leader's group. When group members feel confident, they tend to support and trust a leader who embodies the values and beliefs of the group (i.e., a prototypical leader; Hogg, 2001). Under feelings of uncertainty, however, group members are more likely to support a nonprototypical leader (Rast et al., 2012). The effect of uncertainty on perceptions of leader trustworthiness could be moderated by whether the leader is perceived as being in power by title alone or in power through demonstrating strong ties to the group (Abrams, Randsley de Moura, Marques, & Huchison, 2008). The current study investigated the effect of acquisition of leadership, leader prototypicality, and uncertainty on perceptions of trust in the leader. Leaders either were placed into power by someone else or voted into power by the group and represented either prototypical or nonprototypical qualities. Leader prototypicality and uncertainty significantly influenced perceptions of leader trust and those effects were supported by a three-way interaction of leader prototypicality, uncertainty, and acquisition of leadership. Our results indicate that not only what the leader represents but also how the leader acquired power affects the perception of group members during uncertainty.

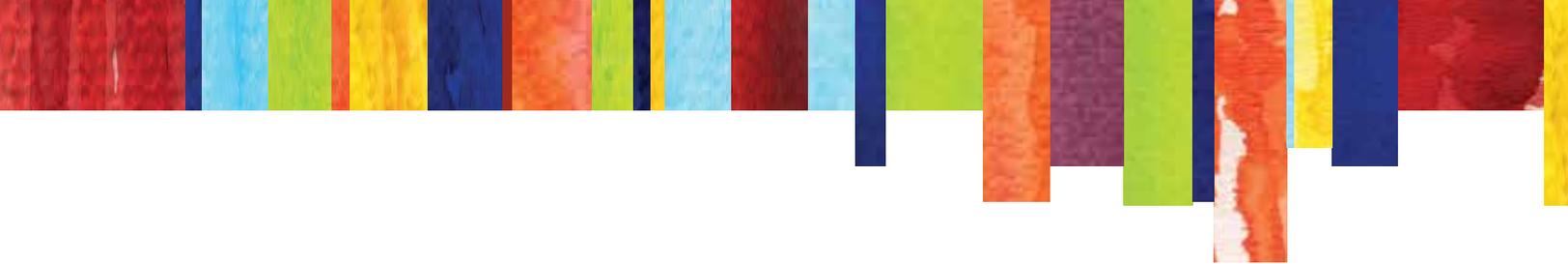


# P75. Aging and the Articulatory System: The Vocal Trajectory of Three Adult Males

Area(s) of study: Social Sciences & Humanities

**Melina Sinclair** | FACULTY OF ARTS

Over the past few decades, the Canadian population has become increasingly older, with the senior population outnumbering the child population for the first time in Canadian history (Statistics Canada, 2016). For this reason, it is necessary to better understand the aging process, and within linguistics, better understand what happens to our vocal system throughout adulthood. The research at hand looks at changes in the articulatory system to inform discussion on the trajectory of communication abilities in later life. In order to study the articulatory system, I look at the phonetic feature voice onset time (VOT). Voice onset time is the length of time (in ms) between the release of a stop consonant and the onset of voicing (Lisker & Abramson, 1964). For example, the VOT in the word *pat* is the length of time between the release of *p* and the onset of voicing for the vowel *a*. Using multiple 5-minute segments of archived speeches from a period of 50 years, I measure and compare the voiceless stops /*p*, *t*, *k*/ of three adult male speakers from mid- to late adulthood, exploring age-related changes in late adulthood. While much of the previous research uses a cross-sectional research method, the current study offers the benefit of five decades of recorded data from the same three speakers. The results indicate that VOT remains stable in late adulthood, with numerous potential sources of this stability. The findings may help inform applied research in pathology of speech and phonetics in aging.



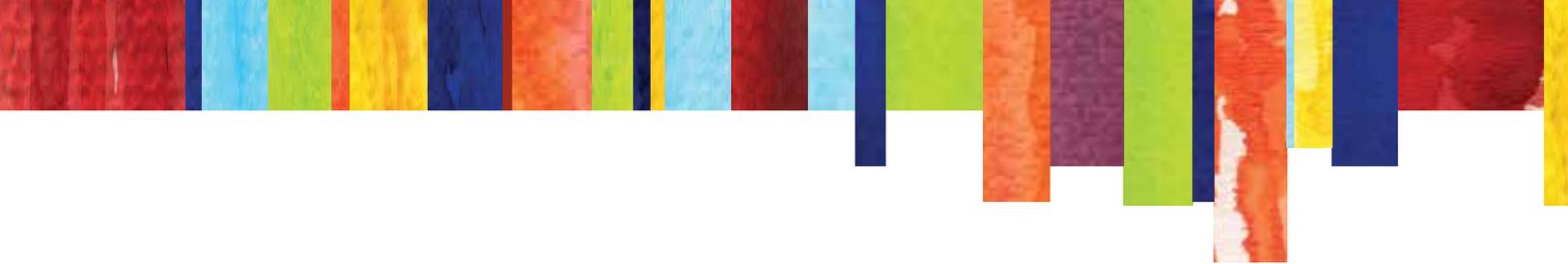
# P76. Mapping Indigenous Community-University Land-based Learning Partnerships

Area(s) of study: Social Sciences & Humanities

**Evan MacDonald** | FACULTY OF ARTS

“Mapping Indigenous Community-University Land-based Learning Partnerships,” is an environmental scan of ongoing partnerships between Indigenous communities and Canadian universities in delivering land-based educational programming. These are sites where Indigenous communities have partnered with universities to facilitate teachings that are rooted in place, taught by local experts, and offer experiences that are culturally relevant for the community while serving to revitalize Indigenous knowledge systems and reconnect students with the ecology they are enmeshed in. Our goal was to understand the current state of this pedagogical phenomenon by categorizing their offerings and marking the spaces they occupy to contextualize the knowledge they transmit. Another objective of our work was to make connections between practitioners of land-based education in order to bring them together to share in their experiences and best practices. We accomplished this by using publically available data to analyze the programs on offer and how they fit into a larger web of Indigenous knowledge being mobilized across several institutions.

This research project was possible through funding from the Tomorrow’s Ideas, Now (TIN) mini-grant by the Undergraduate Research Initiative and the Kule Institute for Advanced Study (KIAS).



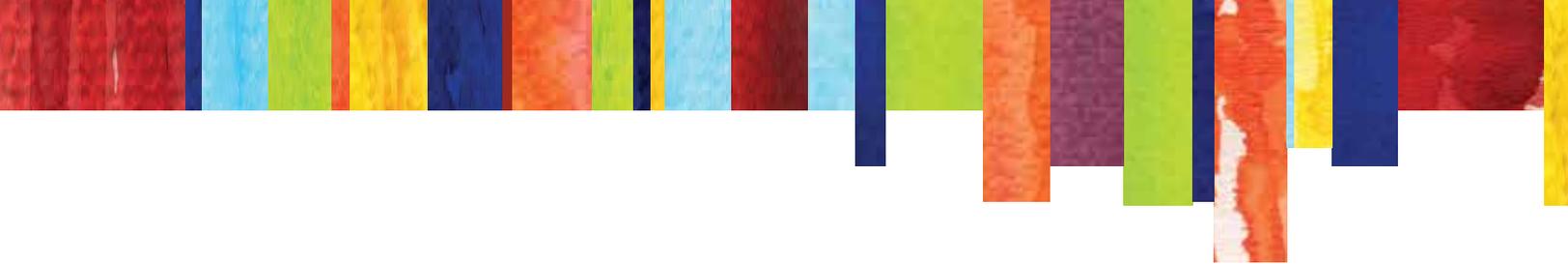
# P77. Social Media and Language Innovations in Contemporary Ukrainian

Area(s) of study: Social Sciences & Humanities

**Stefania Kostiuk\*, Alla Nedashkivska** | FACULTY OF ARTS

The study focuses on current developments, innovations and movements in the Ukrainian language primarily facilitated by social media in contemporary Ukraine. Specifically, the focus is on language transformation following the Revolution of Dignity, (Maidan) in Ukraine in 2014, as well as the correlation with Ukrainian language to Ukrainian identity since the horrific events which took place at Maidan. Furthermore, the study explores tendencies in beliefs about the language, its status and standard, as well as relating them to language ideologies. Questions about political unrest and its relationship to language innovation will be addressed; these questions will recognize, for instance, how the invasion of country, such as Ukraine, triggers linguistic change, innovation, and ideological expression via social media. The researched social media sites represent examples of a new sociolinguistic culture found online, which cultivates shifts in status and value of contemporary Ukrainian through the various movements promoted by these sites.

Social media is studied as a forefront of facilitating new language movements, sociolinguistic challenges, and language ideologies.



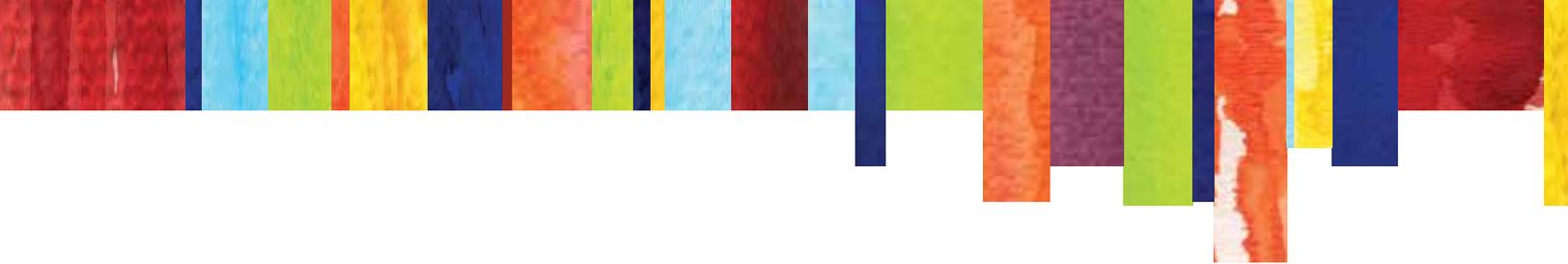
# P78. Behind Closed Doors: How the Original Goals of the Foreign Intelligence Surveillance Act of 1978 Were Lost in a Contemporary Struggle for Power

Area(s) of study: Social Sciences & Humanities

**Alannah Piasecki** | FACULTY OF ARTS

Following the discoveries made as a result of the dubious actions between the White House and the Federal Bureau of Investigation during the infamous Watergate scandal, it was clear that there was a need for greater oversight between presidential powers and intelligence gathering services. As a result, the United States saw the creation of the Foreign Intelligence Surveillance Act of 1978 (FISA), which was designed to prevent future similar scenarios. As demonstrated by the Snowden revelations of 2013 and other indiscretions in between, FISA's original purpose has been lost in the quest for power and the fear of the unknown. Like Watergate, Snowden's actions show the array of participants in the surveillance of citizens and political actors alike. And, like Watergate, Snowden's actions show that intelligence agencies disregarding legislation surround surveillance is not the only problem. It is representative of a far greater institutional problem: the disregard for the protection of civil liberties.

Originally, this research was conducted as a term paper for POL S 332 (American Politics). However, the specificity of exploring the effects of Watergate on contemporary US politics stemmed from a personal interest in the practices of intelligence gathering agencies. This research relied on qualitative methodology: gathering research from academic journal publications, news articles, and United States government documents. By utilizing these sources, I was able to assess the impacts the disregard for FISA has had on public and governmental affairs in the US.



# P79. Lesbian Licking: Political Implications of Cunnilingus in Lesbian Poetry

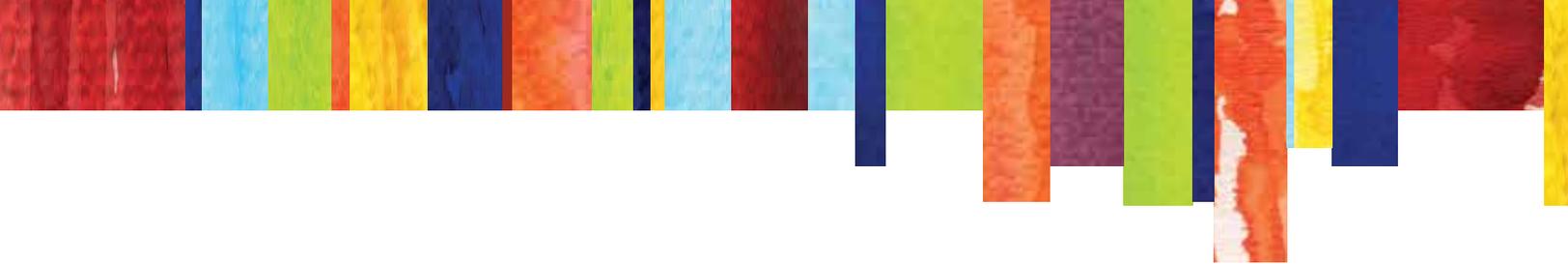
Area(s) of study: Social Sciences & Humanities

**John Evjen** | FACULTY OF ARTS

Oral sex occupies a complex place in sexuality and power. While oral sex is mostly used for the domination of men over women, lesbian cunnilingus gives an interesting example of the resistive potential of oral sex to patriarchal control over women's bodies. Jürgen Habermas theorises there are differing sphere in liberal societies that separate the public and private affairs. The public sphere is made up of public people who discuss the opinion of the nation and policy, and domestic affairs compose the private sphere. In both spheres, men control women through the nexus of nationhood, penetration and reproduction.

A complex relationship exists between nationhood, penetration, and reproduction, forming a nexus of oppression. These interrelationships are the forces that subjugate women under men to perpetuate the liberal nation-state, through being underneath the man of the household. In this sense, liberalism relies on the subjugation of women for its own perpetuation, but the existence of lesbian oral sex is an avenue for escape from the constraints of liberalism.

This paper examines lesbian poetry to explore the effects of lesbian cunnilingus have on notions of liberalism. I use lesbian poetry because of the imaginary it forms its existence. Themes of food, shockwaves, and empowerment exist that challenge the ways that liberalism shapes society. Using the examples of lesbian poetry, I delineate how lesbian cunnilingus counteracts the necessities of liberal society proving that liberalism is unable to contain lesbianism and thus for society to become inclusive, a form of lesbian politics must be established.



# P80. What causes the delay at the morpheme boundary in typewritten production of compound words?

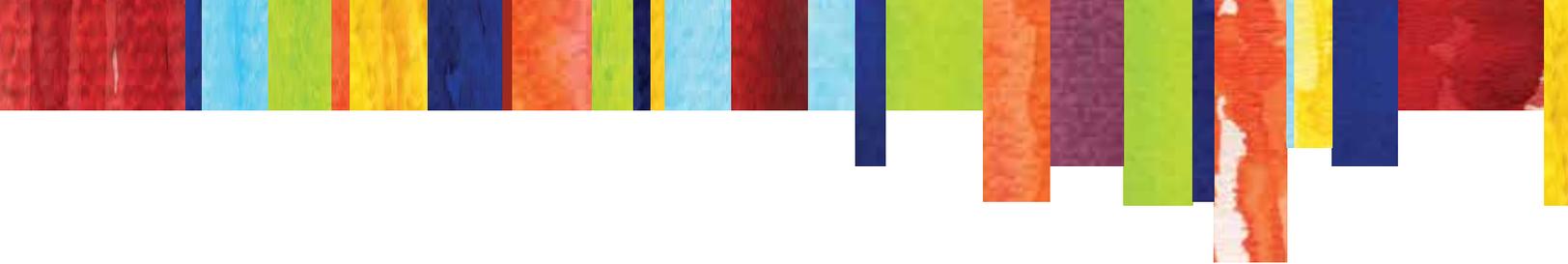
Area(s) of study:

Social Sciences & Humanities, Health Sciences, Other/Interdisciplinary

**Michelle Dang\*, Spenser Halfyard\*, Sarah Johnson\*,  
Beatriz Rubio\*, Christina Gagné, Thomas Spalding**

FACULTY OF SCIENCE

Prior research suggests that the typewritten production of compound words makes use of morphological structures with an increase in typing latency at the morpheme boundary. Compound words are made up of two free morphemes separated by the morpheme boundary (e.g., dogsled); dog is the first constituent (C1) and sled is the second constituent (C2). Our aim is to investigate the cognitive processes that cause the delay at the morpheme boundary by examining errors. Previous research on typing latency suggested that the delay was due to planning for C2. Through examining data with errors, we hypothesize that another possible cause for the delay is error-checking for C1. Ongoing investigations focus on examining the position of the errors in the participants' typed letter string and comparing them to the position of the participants' correction (i.e., the point where the participant makes a deletion to correct the error). We predict a high probability of corrections around the morpheme boundary (which includes the last letter of C1 and the first letter of the C2), which will confirm error-checking as one of the processes occurring during the delay at the morpheme boundary. Further analyses will provide insight on whether the processes that occur during the delay is either error-checking for C1, planning for C2, both, or other additional processes.



# P81. Effects of speech accent on perception of physicians

Area(s) of study: Social Sciences & Humanities, Other/Interdisciplinary

**Chin Lorelei C. Baquiran** | FACULTY OF SCIENCE

People sometimes assume that a person who speaks with a foreign accent possesses negative traits and personality characteristics. The purpose of this study is to test if doctors who speak with a foreign accent are perceived as less competent than doctors who speak with a standard accent. We asked both Canadian and Chinese Canadian undergraduates to rate the competence of a doctor with either a standard Canadian accent or a Chinese accent. The doctor was delivering either good or bad news about the patient's cholesterol levels or cancer. Previous research has shown that when reminded of death, participants favour in-group members (Solomon, Greenberg, & Pyszczynski, 1991). We therefore predicted that the Chinese-accented doctor is more likely to be judged positively by Chinese Canadian participants when given bad news about cancer. Similarly, the standard-accented doctor is more likely to be favourably perceived by Canadian participants in the same condition. The initial results suggest that, as predicted, the accent affects participants' judgements of the doctors' competence.

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