



# MURC

## MULTIDISCIPLINARY UNDERGRADUATE RESEARCH CONFERENCE

### Program Guide

Thursday March 23<sup>rd</sup>, 2017

Friday March 24<sup>th</sup>, 2017

Saturday March 25<sup>th</sup>, 2017

UBC Vancouver

[students.ubc.ca/career/murc](http://students.ubc.ca/career/murc)

#UBCMURC

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## Be Social

We are excited to be live-streaming any digital conversations that take place throughout the conference. If you want to join the conversation online, use #UBCMURC.

Share the highlight of your day, something new you learned, or even share photos on Snapchat and Instagram!

# 3 Day Program

## Day 1 - Thursday March 23<sup>rd</sup> 2017

<b>8:00 am-8:00 pm</b> <b>(All Day)</b>	Posters on Display	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>
<b>5:00 pm-6:30 pm</b>	Oral Presentations	<i>Henry Angus 235, 237, 243, 334, 345, 354, 434</i>
<b>6:45 pm-8:00 pm</b>	Poster Presentation Adjudication	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>

## Day 2 - Friday March 24<sup>th</sup> 2017

<b>8:00 am-8:00 pm</b> <b>(All Day)</b>	Posters on Display	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>
<b>5:00 pm-6:30 pm</b>	Oral Presentations	<i>Henry Angus 234, 235, 243, 334, 334, 345, 354</i>
<b>6:45 pm-8:00 pm</b>	Poster Presentation Adjudication	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>

## Day 3 - Saturday March 25<sup>th</sup> 2017

<b>10:00 am-6:00 pm</b> <b>(All Day)</b>	Posters on Display	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>
<b>1:00 pm-2:30 pm</b>	Oral Presentations	<i>Henry Angus 234, 235, 237, 243, 334, 345, 354</i>
<b>6:45 pm-8:00 pm</b>	Poster Presentation Adjudication	<i>Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer</i>
<b>6:45 pm-8:00 pm</b>	Reception	<i>Alumni Centre</i>

# What is MURC?

Celebrating exciting and innovative undergraduate research at UBC.

## **MURC 2017**

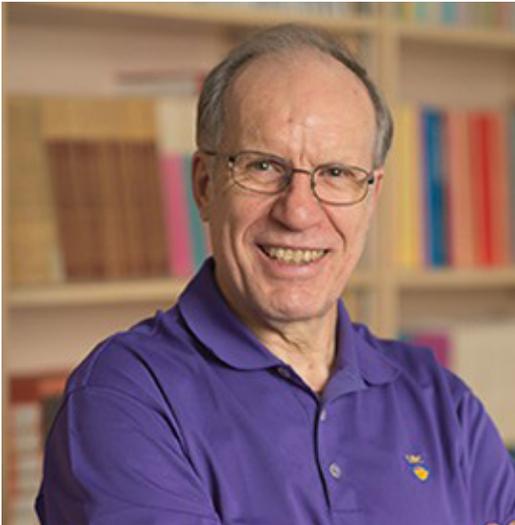
The Multidisciplinary Undergraduate Research Conference is an annual celebration of undergraduate research happening at the UBC Vancouver and UBC Okanagan campuses. Student researchers showcase their research in either oral or poster presentation format.

MURC presenters are any UBC undergraduate student who is participating in, or has completed their own Faculty-supervised research project. All Faculties and Schools are welcome. This year's Conference features over 200 research projects hosted by over 344 presenters.

MURC finalists have the opportunity to apply to present at the annual Universitas 21 Conference, taking place in Edinburgh in the summer of 2017

# Reception Speakers

## Opening Speakers



## Neil Guppy

**Professor**

**Education, Immigration, Social Inequality**

Professor Guppy teaches Introductory Sociology and pursues research in the broad areas of social inequality and education.

He is currently the Senior Advisor to the Provosts, Academic Freedom. In this position he is charged with deepening the conversation around academic freedom at both UBC campuses while also providing educational materials useful to expanding our collective understanding of, and practices related to, academic freedom.

He continues as a Professor in Sociology and a UBC Sustainability Fellow. In the latter role, he works closely with Professor David Tindall (Sociology) on curriculum programming in the UBC Faculty of Arts.



## Valeria Narvaez

**B.A. Economics**

**Minor: Environment and Society**

Valeria Narvaez is originally from Quito-Ecuador. She graduated from UBC in May 2016 with a Bachelor of Arts in Economics and a Minor in Environment and Society. She decided to study economics because questions of welfare and inequality have always been important to her. She likes to volunteer and has experience working for non-profit organizations such as the Red Cross International and the Canadian HIV Trials Network.

In the summer of 2016, she had the opportunity to participate in a multidisciplinary research program called Think, Eat and Grow Green Globally (TEG3). This research program was funded through the Arts Undergraduate Research Awards (AURA) and involved students and faculty members from across UBC as well as partner Universities and organizations from all over the world.

# Reception Speakers

## Closing Keynote



## Jaymie Matthews

**Professor**

### **Astronomy & Astrophysics**

Dr. Matthews is a Professor of Astrophysics in the Department of Physics & Astronomy at the University of British Columbia (Vancouver, Canada). He leads the MOST mission as part of a broad research programme. Prof. Matthews is an expert in the fields of stellar seismology (literally using the surface vibrations of vibrating stars to probe their hidden interiors and histories), exoplanetary science, and astronomical instrumentation and time series analysis. Born in Chatham, Ontario, Canada, he obtained his B.Sc. degree at the University of Toronto, and his M.Sc. and Ph.D. degrees at the University of Western Ontario. Dr. Matthews held Isaac Walton Killam and NSERC Postdoctoral Fellowships at UBC, and an Attaché de Recherche position at the Université de Montreal, before joining faculty at UBC in 1992.



## Michelle Kunimoto

**B.Sc (Hons) Physics and Astronomy**  
**Master's Candidate**

Michelle Kunimoto is a recent graduate of UBC, having completed a Bachelor's degree in Physics and Astronomy last year. Her discovery of 4 new planet candidates placed her on the 2017 Forbes 30 Under 30 list for Science. She plans to continue focusing on exoplanet research and planetary science, and is currently working on a Master's degree in Astronomy at UBC.

# Reception Speakers

## Three Minute Thesis

### **Manveen Kaur (First Place)**

#### **Effect of Fat Protected Vitamin B Supplementation on Bovine Uterus**

Program: MSc in Applied Animal Biology

Supervisor: Dr. Ronaldo L.A. Cerri

### **Seth Tigchelaar, (First Runner Up)**

#### **Biomarkers for Spinal Cord Injury**

Program: PhD in Neuroscience

Supervisor: Dr. Biran K. Kwon

### **Sue Peters (Peoples Choice)**

#### **PAY ATTENTION!**

Program: MSc in Applied Animal Biology

Supervisor: Dr. Ronaldo L.A. Cerri

# Acknowledgements

## A big thank-you

Thank-you to all listed below for your support in organising MURC 2017. We appreciate your time and dedication in making the celebration of undergraduate research at UBC a success.

### Adjudicators

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Neil Armitage  
Neil Guppy  
Pamela Kalas  
Philip Matthews  
Sarah Amundrud

# Acknowledgements

## A big thank-you

Thank-you to all listed below for your support in organising MURC 2017. We appreciate your time and dedication in making the celebration of undergraduate research at UBC a success.

### Volunteers

Alex San Pedro  
Alice Sorrentino  
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### Conference Organizers

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Sandra Wan  
Shayesha Shrestha  
Tony Fang  
Umaima Baig  
Wincy Liu  
Yvonne Kwok

# Prospective Presenters

Do you have a research topic you are passionate about and would like to share it with others?

MURC 2018 will be a fantastic opportunity for you to showcase your research, exchange ideas with other student researchers and the UBC community. We offer multiple series of workshops, which are kindly hosted by UBC faculty members to assist presenters in sharpening their oral and poster presentation skills. Volunteer UBC faculty review submitted abstracts to provide you with professional feedback in preparation for the conference, and your future in research.

Student presenters gain valuable experience and transferable skills beneficial to their future in research and other career paths. If you are eager to share your research with others, we suggest you to start putting your ideas together now! Registration to present at MURC 2018 will begin in January, 2018. We welcome all returning and prospective presenters to join us.

We look forward to seeing you in MURC 2018!

# Thursday Oral Presentation List

**5:00 pm - 6:30 pm**

## Henry Angus 234

**The Genetic Underpinning of Castration-Resistant Prostate Cancer**

Herberts, Cameron

**Narrative: Source of Visual Misdirection?**

Vasilyev, Daniil

**Making Strides: Validating the Step-Counting Ability of iPhones**

Zhao, Yingying & Wunderlich, Kelly

## Henry Angus 235

**HIV Pre-Exposure Prophylaxis and the Canadian media: analyzing the current narratives**

Gregory, Aidan; Ng, Keni & Mortazavi, Leili

**Acetaminophen's effect on the Experience of Anticipated Regret**

Tong, Jessica

## Henry Angus 243

**The Question of the Filipino Identity**

Ferrer, Phebe

**Memory and the Arrow of Time: Is Spacetime a Fractal at Quantum Scales?**

Gil, Seb

**Hippocampal neurogenesis: Modulation by prenatal alcohol exposure and adolescent stress exposure**

Ubi, Kiran

**The Challenge of Thangka: The Role of Tibetan Thangka Painters within Social Changes**

Zhou, Ran

## Henry Angus 334

**Effects of Low-dose versus Normal-dose Psychostimulants on Executive Functions in Children with Attention-Deficit Hyperactivity Disorder (ADHD)**

Balce, Kristina

**Exercise and the osmorepiratory compromise in dogfish sharks (*Squalus acanthias suckleyi*)**

Greer, Chelsea

**Do social preferences affect perceptual learning?**

Wong, Karina & Senior, Brianne

# Thursday Oral Presentation List

## 5:00 pm - 6:30 pm

### Henry Angus 345

#### **The role of cis-p-tau and apolipoprotein E in Alzheimer's Disease**

Cheung, Janelle & Chen, Calvin

#### **Obviation In Ktunaxa**

Gatchalian, Terrance

#### **The effects of Autism Spectrum Disorder-associated gene variants on experience driven dendritic growth**

Lidell, Matt & Cau, Alessandro

#### **How Community Service Learning Impacts Medical Professional Identities**

Liem, William

### Henry Angus 354

#### **Neighbourhood Income Versus Supermarket Quality in Vancouver, BC**

Knapp, Hugh

#### **A Call for Increase in Awareness for Familial Hypercholesterolemia - a leading cause of Cardiovascular Disease**

Shokoohi, Aria & Poon, Amy

#### **Influence of ADRA2B deletion polymorphisms on emotional learning**

Zhang, Michelle

### Henry Angus 434

#### **Sex differences in lipid storage and metabolism in Drosophila melanogaster**

Hui, Daniel

#### **Evaluation of the imprinting status and expression pattern of Carboxypeptidase A4 in mice**

Nguyen, Jimmy

#### **Eyes are the window to the soul - and a biomarker of concussion?**

Stubbs, Jacob

#### **Response Markers in English: A Corpus-based Study**

Yuan, Yifang

# Thursday Oral Presentation Abstracts

Henry Angus 234, 5:30 pm - 6:30 pm

## **The Genetic Underpinning of Castration-Resistant Prostate Cancer**

**Presenter: Cameron Herberts**

Prostate cancer is the most common cancer diagnosed in men, representing 21% of all new cancer diagnoses in 2016 in Canada. A significant subset of patients will develop metastatic disease that invariably progresses to lethal castration-resistant prostate cancer (CRPC) for which treatment options are limited. This form of prostate cancer is the inevitable consequence of developing a resistance to androgen deprivation therapy – a first line treatment that aims to suppress prostate cell growth (in both healthy and malignant tissues). A central aim in prostate cancer research is to assess how a cancer's genomic landscape changes as it evolves, and to identify any targetable mutations that may allow for the development of new therapies. At present, several common genomic alterations in key cancer genes have been identified that contribute to the development of CRPC, but our picture of this is still largely incomplete. The goal of this research project is to pinpoint key mutations in CRPC patients undergoing Docetaxel treatment, and to evaluate the extent to which these mutations dictate the cancer's development and correlate to patient prognosis. Cancer is manifestly a disease of the genome; understanding the interplay between disease progression, clinical treatments, and genomic alterations is key to advancing our capacity to treat prostate cancer by means of new therapies.

# Thursday Oral Presentation Abstracts

Henry Angus 234, 5:00 pm - 6:30 pm

**Narrative: Source of Visual Misdirection?**

**Presenter: Vasilyev, Daniil**

Magicians would guide their audiences' attention to their right hand, while hiding an object with their left hand. Since the audience paid attention primarily to the right hand, they did not realize what happened with said object. This is what the research community calls visual misdirection. Numerous studies have found that change blindness (viewers not noticing glaring visual changes in a video) can be induced through visual misdirection. This particular study seeks to find out if film narrative could help guide visual misdirection. Eight 45-second long vignettes were presented to the participants. Each vignette follows a distinct narrative and includes one anomaly in it (chairs disappearing/hats appearing). Four videos include the anomalies during the meaningful moments, while the other four have them during the non-meaningful moments. A meaningful moment is one that contains emotional and/or informational power to the narrative. Participants were asked to view each video in random order and press spacebar anytime they spotted something "interesting". Afterwards, the participants would answer if they spotted the anomalies. The dependent variable is whether the participants would spot the anomalies. The independent variable is the location of each anomaly (meaningful versus non-meaningful moment in the video). We anticipate that anomalies that occur during meaningful moments would be harder to spot than those that occur during non-meaningful moments.

# Thursday Oral Presentation Abstracts

Henry Angus 234, 5:00 pm - 6:30 pm

## **Making Strides: Validating the Step-Counting Ability of iPhones**

**Presenters: Zhao, Yingying & Wunderlich, Kelly**

Self-monitoring is an important self-regulatory technique for facilitating behaviour changes such as increasing physical activity. It is now possible to monitor physical activity using smart phone devices. The majority of Canadians (73%) own at least one smartphone. However, before smart phones are used for public health goals (for example as a tool for assessing the effects of interventions to promote physical activity) it is necessary to confirm their validity. The purpose of this study was to validate iPhone's (iPhone 6 or newer, running iOS 10 software) step-counting ability in controlled lab conditions and in a free-living condition that reflects natural usage of smartphones. In the lab condition, steps were recorded during one-minute intervals at four different speeds comparing personal iPhones to a criterion measure (manual counting by a research assistant) and another iPhone (SE, iOS 10). During the free-living condition steps recorded by the participants' iPhone were compared to the Actigraph GT3X accelerometer worn for 3 days at 10h/day. Thirty-three participants have completed the protocol and final results will be presented. Preliminary data suggests that there is high correlation between steps counted using iPhones and accelerometers while the iPhones tend to under-report.

# Thursday Oral Presentation Abstracts

Henry Angus 235, 5:00 pm - 6:30 pm

**Title: HIV Pre-Exposure Prophylaxis and the Canadian media: analyzing the current narratives**

**Presenters: Gregory, Aidan; Ng, Keni & Mortazavi, Leili**

An antiretroviral-based regimen, known as Pre-exposure prophylaxis (PrEP), has emerged as an highly effective HIV prevention option for high-risk populations. Multiple clinical trials have proven its efficacy and Canadian mainstream and lesbian, gay, bisexual, transgender and queer (LGBTQ) have described it as revolutionary for gay, bisexual, and other men who have sex with men (GBMSM), lauding its potential to reduce HIV infections for intravenous drug users and other high risk populations. However, counter to this narrative are critiques of high costs associated with being on PrEP, lack of doctor's knowledge about and willingness to prescribe PrEP, and stigma towards those on or interested in being on PrEP. In this paper, we provide initial findings from a study of the Canadian mainstream and LGBTQ media on the topic. Predominant themes concerning PrEP include different health organizations both nationally and internationally approving the drug and the potential effectiveness for certain populations (e.g., gay, bisexual, and other men who have sex with men) to prevent HIV infection. However, the media has also critiqued the accessibility based on cost, a stigma that is associated with taking the drug, and resistance by healthcare professionals. Based on our initial findings, there are challenges associated with the mainstream and LGBTQ media discussions about PrEP. There has yet to be a definitive opinion about this medication as it does provide great opportunities but potentially it is limited to only particular groups.

# Thursday Oral Presentation Abstracts

Henry Angus 235, 5:00 pm - 6:30 pm

**Title: Acetaminophen's effect on the Experience of Anticipated Regret**

**Presenter: Tong, Jessica**

Acetaminophen (or Tylenol) is a painkiller that has been shown to not only reduce physical pain but also reduce psychological "pain" from negative stimuli and anxious arousal. For example, the negative emotions and anxiety caused by social rejection and feelings of uncertainty are reduced when people are given acetaminophen (DeWall et al., 2010; Randles et al., 2013). However, no research exists on the effects of acetaminophen on anticipated regret, a type of psychological pain that has been shown to affect decision making and behaviours such as buying or exercise (Simonson, 1992; Abraham & Sheeran, 2004). We argue that anticipated regret is a type of anxious arousal that is similar to the psychological discomfort of rejection or uncertainty. Therefore, we hypothesized that if acetaminophen reduces anxious arousal and sensitivity to negative stimuli, then it should also reduce people's experience of anticipated regret. We employ a double-blind procedure, using undergraduate participants and randomly assign them to receive either 1000 mg of Tylenol or a sugar placebo. After waiting for 55 minutes, participants are asked to complete a number of computerized tasks that involve decision making while anticipating potential regret. The task includes making a difficult purchase decision and rating which situation they would expect to produce more regret. Our current data trends show that those in the Tylenol condition anticipated less regret than those in the control condition.

# Thursday Oral Presentation Abstracts

Henry Angus 243, 5:00 pm - 6:30 pm

**Title: The Question of the Filipino Identity**

**Presenter: Ferrer, Phebe**

The question of the Filipino identity is a haunting one. With its roots in defiance against Spanish colonization, and its changing meaning with history and migration, how may one define what it means to be Filipino? What distinguishes this identity and makes it unique, even as it is seeped in colonial influence and westernization? How does this identity operate within the Philippines' vast internal cultural diversity? My research involves exploring these questions and deconstructing the Filipino identity, in order to understand its foundations and definitions for both the Philippine state and the people who claim this identity as their own. I intend for this research to eventually become a student-led seminar, to engage students towards the Philippines through the topic of identity. My presentation will introduce this research on three main points: the depth of colonial influence and the effect this has on identity; the effect of migration, with a focus on the Filipino diaspora to Canada, specifically communities in Vancouver; and the concept of something "truly Filipino" amidst cultural and lingual mixing and borrowing, which for some has made the identity a patchwork of other cultures with nothing unique to its name. The presentation will also introduce frameworks created and used by Filipino scholars to navigate their identity on their own terms.

# Thursday Oral Presentation Abstracts

Henry Angus 243, 5:00 pm - 6:30 pm

**Title: Memory and the Arrow of Time: Is Spacetime a Fractal at Quantum Scales?**

**Presenter: Gil, Seb**

A central idea in theoretical physics is that conservation laws are represented mathematically by symmetries. Perhaps the most important symmetry is that of systems whose behavior is invariant under translations in time. This symmetry is associated with conservation of energy. The motion of such systems is expected to be time-reversible and solvable in isolation of their environment. Crucially, quantum mechanics is founded on Hamiltonian mechanics, which is valid only for conservative systems. But a central finding of thermodynamics is that no system is truly isolated. Any macroscopic system that dissipates mechanical energy as heat, such as seen in friction, is referred to as nonconservative.

Although the existence of dissipative quantum systems has been experimentally confirmed, their behavior is notoriously difficult to explain in the conventional framework of quantum mechanics because quantum systems are implicitly assumed to be conservative. Since Big Bang models predict the universe emerged from a quantum-mechanical singularity, a better understanding of dissipation may shed light towards understanding 'the arrow of time' that drives the true irreversible nature of the world. My research incorporates the techniques of the fractional calculus to explicitly account for dissipation in quantum systems. The behavior of a microscopic particle is thus found to have an explicit time dependence—a memory—dictated by its surroundings. The particle trajectory in the ensuing paradigm is best described as a fractal curve, implying the possibility that at the smallest of scales space-time may not necessarily be smooth, but instead imbued with a beautiful rich structure of self-similarity.

# Thursday Oral Presentation Abstracts

Henry Angus 243, 5:00 pm - 6:30 pm

**Title: Hippocampal neurogenesis: Modulation by prenatal alcohol exposure and adolescent stress exposure**

**Presenter: Ubi, Kiran**

Fetal Alcohol Spectrum Disorder (FASD) encompasses a wide range of developmental deficits. One deficit is central nervous system abnormalities. Of particular relevance, prenatal alcohol exposure (PAE) has been shown to decrease hippocampal (HPX) neurogenesis (birth of new neurons) across the lifespan; however research is lacking in adolescence. Adolescence is a critical period of neural, physiological, behavioural, and social development and is thus important to examine following PAE. Additionally, many of the deficits that occur are worsened when PAE is combined with stress exposure, a common occurrence during adolescence. Therefore, this study aimed to examine unique and/or interactive effects of PAE and chronic stress exposure on neurogenesis during adolescence in rats. To model PAE, pregnant females were assigned to one of three diet groups: PAE (liquid ethanol-diet, ad libitum); pair-fed (liquid control-diet yoked to PAE consumption); and control (ad libitum control-diet). To model stress exposure, half the animals in each group were singly housed for 10 days (a treatment shown to increase stress due to lack of social interaction) starting from postnatal day 36. Neurogenesis was measured through staining for doublecortin, an endogenous marker for immature neurons, in the HPX. We hypothesize that PAE and social isolation stress will each decrease HPX neurogenesis and that their combined effects will amplify this result. Overall, this study will aid in our understanding of the persistent effects of PAE on brain development and plasticity across the lifespan. Supported by: NIH/NIAAA R37AA007789 and R01AA022460, NeuroDevNet-20R64153 to JW; CIHR to LAMG; NSERC and Aboriginal-Graduate-Fellowship to SB.

# Thursday Oral Presentation Abstracts

Henry Angus 243, 5:00 pm - 6:30 pm

**Title: The Challenge of Thangka: The Role of Tibetan Thangka Painters within Social Changes**

**Presenter: Zhou, Ran**

In the last 50 years, the Tibetan people have undergone a complete transformation from a secluded Buddhist nationhood, to an exiled community caught between tradition and modernity. In traditional Tibetan culture, the intimate connections between the gods and people are central to the significance of thangka, a type of Tibetan painting on cotton or silk. This connection is heightened by the fact that, traditionally, Tibetan thangka painters are monks, people who have devoted their lives to connecting with the gods. Tibetan art has become more diversified since the relaxing of religious constraints on its content. In 1950, Tibet's political and cultural situation changed dramatically when the Chinese army occupied the country. The subsequent social changes completely affected what happened next to Tibetan art and artists. Since the fourteenth Dalai Lama had established a government in exile in India, and the Chinese governance of Tibet caused crisis of indigenous culture, a large number of Tibetan artists moved to foreign countries and started to rethink their culture and art. This presentation, by exploring artistic and social function changes of thangka through timeline, will focus on the situation of Nepali thangka market and then further discuss the tensions between a thangka painter's various roles as a religious figure (reverted like a Lama), artist, and businessperson, and what kind of challenges they are facing at present.

# Thursday Oral Presentation Abstracts

Henry Angus 334, 5:30 pm - 6:30 pm

**Title: Effects of Low-dose versus Normal-dose Psychostimulants on Executive Functions in Children with Attention-Deficit Hyperactivity Disorder (ADHD)**

**Presenter: Balce, Kristina**

Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common psychiatric disorders of childhood. The symptoms include behavioural problems (hyperactivity and impulsivity) and/or cognitive deficits (difficulties in attention, working memory and other executive functions [EFs]), which impact school performance and social relations. Physicians prescribe medications called psychostimulants to treat ADHD. To determine the right dose they go by a parent's report of the child's behaviour; no cognitive tests are given. Recent neuroscience findings indicate that the optimal doses for controlling behaviour may be too high for aiding cognition. The moderate to high doses currently given preferentially aid the striatum, a brain region involved in the behavioural symptoms of ADHD. Lower doses act differently, aiding prefrontal cortex (PFC), a region critical for the cognitive functions impacted by ADHD. In this study, we predicted that children with ADHD would show better cognitive performance on half their normal psychostimulant dose. We tested 10 children with ADHD (7-14 years old) on measures of EFs, reading and math. In this double blind, crossover design, children were given their normal dose in one session and half that in the other session. Half were tested on their normal dose first and half on the lower dose first. Neither child, parent, nor researcher knew who was getting which dose when. As predicted, cognitive performance was consistently better at the lower dose. These findings have important implications for the standard of care for ADHD.

# Thursday Oral Presentation Abstracts

Henry Angus 334, 5:30 pm - 6:30 pm

**Title: Exercise and the osmorepiratory compromise in dogfish sharks (*Squalus acanthias suckleyi*)**

**Presenter: Greer, Chelsea**

The fish gill is the primary site of both respiration and ion regulation – two actions essential for biological functioning. A permeability trade-off occurs at the gills when ion retention is sacrificed in order to improve gas exchange, or vice versa. The term “osmorepiratory compromise” refers to the functional conflict that can exist between these two processes. Exercise is an inherent part of fish ecological interactions, where they are forced to chase prey, escape predators, and endure long migrations. There is still much unknown regarding how cartilaginous fish (sharks) cope with the osmorepiratory compromise. We evaluated the potential physiological trade-offs at the gills of dogfish sharks (*Squalus acanthias suckleyi*) after exhaustive exercise, where metabolic oxygen (O<sub>2</sub>) demand was elevated. We hypothesized that (1) the rise in oxygen metabolic demand caused by exhaustive exercise would lead to increase in ventilation rate and consequently increased in gill nitrogen fluxes, and (2) increased oxygen availability would minimize or prevent the associated effects of exhaustive exercise on gill nitrogen fluxes. Each fish (n=8) was exercised for 20 minutes, followed by a 4-hour recovery period in a closed box with normoxic or hyperoxic water. Exercise does not seem to increase gill ventilation rate in the same proportion as O<sub>2</sub> consumption. Increasing O<sub>2</sub> supply did not prevent against unfavourable urea-N fluxes and did not appear to suppress gill ventilation. These findings will expand current understanding of the interactive effects of multiple stressors on the physiology of sharks and enhance the existing knowledge of gas exchange and ion regulation.

# Thursday Oral Presentation Abstracts

Henry Angus 334, 5:00 pm - 6:30 pm

**Title: Do social preferences affect perceptual learning?**

**Presenters: Wong, Karina & Senior, Brianne**

Humans possess a robust speech recognition system. Although the pronunciation of any given word varies between dialects, accents, and individuals, listeners generally comprehend spoken language with ease. A trademark feature of the human speech recognition system is that it is stable enough to recognize words reliably, yet flexible enough to accommodate pronunciation differences. A key mechanism behind this is perceptual learning: changes in perception resulting from exposure to a novel signal. That is, stimuli that were not previously recognized as an interpretable pronunciation of a particular word are now accepted. We investigate whether social preferences impact perceptual learning. Listeners do not weigh all information in the speech signal equivalently; for example, they may attend less to dispreferred accents (Lippi-Green, 1997). We test a vowel shift where the “o” vowel in words like “nose” was replaced with the “a” vowel (i.e., “nose” pronounced “nahz”). A voice actor produced a passage from Pinocchio with the shifted vowels, in both a pleasant style and an unpleasant style (i.e., creaky, monotone), and with normal vowels in a control condition. 36 native English speakers were randomly assigned to one of these exposure conditions and then presented with auditory items to categorize as words or nonwords. Listeners who heard the story with shifted vowels accepted the novel pronunciations (e.g., “nahz”) as words, while those in the control condition did not. However, listeners who heard the unpleasant-sounding version endorsed new test words less, suggesting that social preferences may play a part in the generalization of perceptual learning.

# Thursday Oral Presentation Abstracts

Henry Angus 345, 5:00 pm - 6:30 pm

**Title: The role of cis-p-tau and apolipoprotein E in Alzheimer's Disease**

**Presenters: Cheung, Janelle & Chen, Calvin**

Alzheimer's disease (AD) is the most common form of dementia as 1 in 9 people over the age of 65 will have AD. The two pathological hallmarks of AD are neurofibrillary tangles (NFTs), which are intracellular aggregates of hyperphosphorylated tau proteins, and amyloid plaques. These abnormal forms of proteins cause neuronal dysfunction and death, but the exact disease mechanism remains unknown. Recently, tau protein is shown to adopt either a trans- or a cis- structure, which was not known before. In a model of traumatic brain injury, phosphorylated forms of cis-tau (cis-p-tau) is pathogenic by causing disruption of axonal functions and cell deaths. More importantly, cis-p-tau has a prion-like propagation properties, allowing it to spread from cell-to-cell in the neural networks. In this study, we propose to investigate the properties of cis-p-tau in a model of AD. Apolipoprotein E (ApoE) is the strongest genetic risk factor of AD. In human, there are 3 common ApoE isoforms: ApoE2, ApoE3, ApoE4. ApoE4 is associated with a higher AD risk. Therefore, we will also test the interaction of ApoE with cis-p-tau. We propose to crossbreed the 3x-Tg AD mouse model with the ApoE2/3/4 target-replacement mice. Cis-p-tau will be seeded in these mice at a young age, and the development of AD pathology will be monitored over 7 months. Assessment will be based on behavior (motor and cognition) and pathology (NFT and amyloid). The propagation properties of cis-p-tau from these mice at the end of the study will also be tested. We hypothesize that cis-p-tau will worsen behavioral and pathological deficits most prominently in the 3xTg- AD x ApoE4 mice.

# Thursday Oral Presentation Abstracts

Henry Angus 345, 5:00 pm - 6:30 pm

**Title: Obviation In Ktunaxa**

**Presenter: Gatchalian, Terrance**

Ktunaxa, an endangered linguistic isolate native to British Columbia, exhibits a morphological system manifested on all third-person nominals, often described in linguistic literature as Obviation (Dryer 1992, 2006; Aissen 1997). Ktunaxa ranks all third-person nominals relative to each other, with one nominal bearing Proximate status and all others bearing Obviative status. In languages with a similar system, this ranking is sensitive to semantic, syntactic, and discursive contexts. However, Ktunaxa's Obviation system appears to diverge markedly from Obviation systems described in other languages and lacks a systematic, language-specific description. The aim of the present study is to deconstruct claims published about Obviation as they relate to Ktunaxa grammar. Semantic and syntactic claims were tested against native speaker judgements through grammaticality judgement tasks. In addition, we elicited a pair of stories with a native speaker using a targeted storyboard (Burton & Matthewson 2015). These stories formed the basis for the analyzing the role of discourse on Obviation in a storytelling context. The immediate goal of this study is to understand how Kuntaxa Obviation diverges from previously described systems in other languages. Ultimately, a systematic description of how Obviation functions in Ktunaxa is a prerequisite to the development of pedagogical materials for language revitalization. This research also presents a further case-study in how reference-tracking systems may be organized, with implications for linguistic theory in the interface between syntax and discourse.

# Thursday Oral Presentation Abstracts

Henry Angus 345, 5:00 pm - 6:30 pm

**Title: The effects of Autism Spectrum Disorder-associated gene variants on experience driven dendritic growth**

**Presenters: Lidell, Matt & Cau, Alessandro**

The mature human brain is composed of approximately 100 billion neurons integrated into functional networks with millions of synaptic connections. The dynamic growth of neurons into functional networks is driven by natural sensory experiences. Mutations in key neuronal genes may profoundly affect dendritic arbor size, morphology and synaptogenesis. This could lead to the formation of impaired neuronal circuits and developmental brain disorders. Phosphatase and tensin homolog (PTEN) is a crucial negative regulator of the PI3K/mTOR pathway. This phosphatase suppresses migration, proliferation and hypertrophy of many cell types including neurons. Recent exome sequencing studies have discovered several de novo missense PTEN mutations found in individuals with autism spectrum disorder (ASD). While much work has been done to elucidate PTEN's function as a tumor suppressor in the development of various cancers, its role in brain development is not largely understood. Our aim is to test the effects of ASD-associated PTEN variants on experience-driven growth in vivo in visually stimulated, awake *Xenopus laevis* tadpoles. We utilize single-cell electroporation to deliver variants into single neurons in the optic tectum followed by imaging of the dendritic arbor using 2-photon time-lapse imaging. By comparing the results of expression of ASD-associated PTEN variants with expression of wild-type PTEN we can make conclusions on the implication of these variants on neuronal development. Preliminary work suggests that delivery of human autism-associated PTEN variants into developing neurons affects dendritic growth and interferes with proper synapse formation. These differences give insight into the development of neurons expressing ASD-associated gene variants.

# Thursday Oral Presentation Abstracts

Henry Angus 345, 5:30 pm - 6:30 pm

**Title: How Community Service Learning Impacts Medical Professional Identities**

**Presenter: Liem, William**

Emphasis on patient-centered care is emerging as a key consideration for health providers. The growing importance of this model and vision has resulted in concentrated efforts to find ways to improve and better the quality of care. One area that is underexplored is how the attitudes and beliefs of medical students are shaped by their activities and associations during their medical education, and how this could subsequently impact their approach to care. This study aims to understand the attitudes medical students developed because of their training placements. To achieve these aims, this project will examine how two UBC led Community Service Learning (CSL) programs, the Talk to Your Doctor (TTYD) and Community as Teacher Cultural Camp (CaTCC) programs, affect the development of medical professionals' identities. Through in-depth, semi-structured interviews with UBC medical students (n=8), results show differences in key reflections from each program. Students who engaged in CaTCC developed more finely-tuned cultural sensitivity skills, patient-centered care values, as well as increased interest in working with vulnerable populations, in specific, Aboriginal groups. Those who engaged in TTYD showed interest in broadly adopting patient-centered care values, but also note that they may change their perceptions once they go into practice. Further investigation on the long-term impacts of CSL programs might elucidate underlying healthcare provider values—preferably one that specifically examines one CSL program at a time to focus on how specific CSL programs impact medical identities and values.

# Thursday Oral Presentation Abstracts

Henry Angus 354, 5:00 pm - 6:30 pm

**Title: Neighbourhood Income Versus Supermarket Quality in Vancouver, BC**

**Presenter: Knapp, Hugh**

Several studies have inquired of food deserts and food access in the United States and Canada. This research analyzes access to quality foods and quality supermarkets in the city of Vancouver, BC. This study investigates the relationship between neighbourhood income, using data from the 2011 National Household Survey, and the quality of 20 national chain supermarkets operationalized simply from the price of goods (three price categories were used to gather the data for nine items: the highest price available, the lowest price available, and the eye-level price). Supermarket quality is a reflection of the price and the price range of goods. The nine goods are chicken breast (1kg), 1% milk (1L), butter (454g), eggs (12), bread (675g), oranges (1Kg), onions (1Kg), peanut butter (500g), and toilet paper (12). The prices were gathered in-store. The results indicated that there is a positive relationship between neighbourhood income and supermarket quality. In neighbourhoods of higher average income, there are not only supermarkets of greater quality, but there is also a greater range of quality compared to neighbourhoods of lower average income. These results have health implications as those with greater access to higher quality foods can benefit from nutritious and healthier items. Additionally, a greater range of quality of goods allows shoppers more choice in what goods to purchase. Further research would benefit from inquiring about shopper behaviour in cities and the relationship between zoning and supermarket placement.

# Thursday Oral Presentation Abstracts

Henry Angus 354, 5:00 pm - 6:30 pm

**Title: A Call for Increase in Awareness for Familial Hypercholesterolemia - a leading cause of Cardiovascular Disease**

**Presenters: Shokoohi, Aria & Poon, Amy**

Heterozygous familial hypercholesterolemia (HeFH) is one of the most common genetic diseases. HeFH is characterized by life-long elevation of plasma low-density lipoprotein cholesterol (LDL-C), with untreated individuals having a twenty-fold increased risk of early cardiovascular disease (CVD). Although HeFH is extremely prevalent and can be effectively treated with statins, vast majority HeFH cases still remain undiagnosed. While our knowledge of the causes of HeFH has advanced, we hypothesize that important knowledge gaps still exist. The purpose of this study was to create the BC FH Registry to track current treatment patterns and outcomes of patients with HeFH in British Columbia. Patients were recruited at the Healthy Heart Program Prevention Clinic at St. Paul's Hospital, Vancouver, BC. The Dutch Lipid Clinic Network Criteria was used to stratify patients as 'definite', 'probable', or 'possible' FH according to their physical examination, laboratory results, and family history. Through additional cascade screening, over 1500 HeFH individuals were contacted, with 872 consented to join the registry since its inception in 2012. The mean LDL-C at baseline was 5.9 mmol/L, which was reduced by 37.3% to 3.7 mmol/L at last follow-up. The use of lipid-lowering therapies increased from 35.7% at baseline to 84.7% at last follow-up. Despite the aggressive use of lipid lowering agents and combined therapy, majority of these patients still remain at high risk of CVD. Our results fill a gap in knowledge regarding contemporary trends in the management of patients with HeFH in Canada.

# Thursday Oral Presentation Abstracts

Henry Angus 354, 5:00 pm - 6:30 pm

**Title: Influence of ADRA2B deletion polymorphisms on emotional learning**

**Presenter: Zhang, Michelle**

Emotionally salient stimuli better capture our attention and hold a special place in our memory. There are large individual differences in the enhancement of emotional processing. A deletion variant of the ADRA2b gene, which codes for the alpha2b adrenoceptor, is associated with increased norepinephrine availability in the brain. It has been found to enhance emotional modulation of attention and memory, but little is known about its influence on emotional learning and flexibility. In this study, we investigated the relationship between the ADRA2b polymorphism and emotional bias flexibility. Participants were genotyped and completed computer tasks measuring changes in emotional bias. First, in a bias-probe task, participants were presented a morphed continuum of happy and angry faces, and were asked to judge each face as either happy or angry. Then, in the adaptation phase, participants were presented with a series of unambiguously angry faces in a working-memory task. Finally, to determine the change in emotional bias, another bias-probe is performed post adaptation. The task design utilizes the facial emotion adaptation effect, where repeated exposure to angry faces would shift perception of ambiguous faces to happy. Preliminary data based on 51 genotyped participants (20 deletion carriers) shows an increased adaptation effect in deletion carriers for unambiguously angry faces only. Previously, the deletion variant of ADRA2b has been implicated in enhanced emotional attention and memory. The present finding suggests the same genotype is also associated with enhanced emotional flexibility or learning, which is key in the formation of affective biases in attention and memory.

# Thursday Oral Presentation Abstracts

Henry Angus 434, 5:00 pm - 6:30 pm

**Title: Sex differences in lipid storage and metabolism in *Drosophila melanogaster***

**Presenter: Hui, Daniel**

Lipid metabolism and storage is a sexually dimorphic trait in many species. Throughout the lifespan of *Drosophila melanogaster*, females have higher triglyceride levels than males. Yet the molecular mechanism underlying this increased triglyceride storage in females is unknown. The focus of my project is to examine a role for the triglyceride lipase brummer (*bmm*), a nutrient-responsive regulator of fat storage, in creating sex differences in triglyceride storage. The goals of this project are to determine whether 1) *bmm* acts differently in females, and 2) whether differential *bmm* activity is the underlying mechanism for differing triglyceride levels between the sexes. Here we show that overexpression of *bmm* in the fat body has a greater lipid-depleting effect in males than in females. This suggests that *bmm* activity is regulated differently between males and females, and this difference is partly responsible for the higher triglyceride level in females observed. To further characterize the activity of *bmm*, we made transgenic flies expressing the full-length *bmm*. In contrast to prior studies using an embryonic version of *bmm* which is truncated, the full-length *bmm* is not constitutively active. This suggests a previously unrecognized level of *bmm* regulation. This work will eventually provide important insight into genes that control sex differences in lipid storage, and diseases such as obesity and cardiovascular disease that are caused by abnormal lipid storage.

# Thursday Oral Presentation Abstracts

Henry Angus 434, 5:00 pm - 6:30 pm

**Title: Evaluation of the imprinting status and expression pattern of Carboxypeptidase A4 in mice**

**Presenter: Nguyen, Jimmy**

Mammals normally inherit two copies of any given gene, one copy from each parent. For most genes, both copies, or alleles, are expressed to give a specific phenotype. For certain genes, only one allele is expressed while the other is silenced. Genomic imprinting is an epigenetic mechanism of gene regulation by which certain genes display a mono-allelic expression pattern that is dependent on its parent of origin. It has been previously reported that the gene coding for carboxypeptidase A4 (CPA4) may be a strong candidate gene for Silver-Russell syndrome and prostate cancer aggressiveness. CPA4 has been shown to have preferential maternal expression in several human fetal tissues, however, the expression pattern has been poorly characterized in mice. Thus, this on-going study aims to evaluate the expression pattern of Cpa4 in mice. We generated reciprocal crosses of CAST and C57BL/6 mice and isolated mRNA from umbilical cord and skin samples, two tissues known to express Cpa4. Next, we generated cDNA which was analyzed through Sanger sequencing following RT-PCR across polymorphisms within Cpa4. We evaluated the allelic expression pattern of Cpa4 by using these intragenic single nucleotide polymorphisms as markers of parental origin. The data thus far have suggested that Cpa4 may have preferential maternal expression in the skin tissue and umbilical cord.

# Thursday Oral Presentation Abstracts

Henry Angus 434, 5:00 pm - 6:30 pm

**Title: Eyes are the window to the soul - and a biomarker of concussion?**

**Presenter: Stubbs, Jacob**

*Introduction:* Mild traumatic brain injury (mTBI) results in between 1.4 million and 3.5 million emergency room visits annually in the US. Yet despite almost epidemic numbers, there exists no standardized biomarker to diagnose or prognosticate outcomes of mTBI. It has long been known that that eye movement and attentional circuits of the brain are damaged in mild traumatic brain injury. Recent work has attempted to quantify and standardize eye movement variability as an objective biomarker of mTBI, yet the sensitivity and specificity of such paradigms are still insufficient for diagnostic use.

*Methods:* This is a pilot study which combines a working memory reaction time task within a smooth pursuit eye movement task. Participants follow a target around a circular trajectory and their eye movements are tracked using infrared video-oculography. The study also evaluates possible psychiatric confounds to smooth pursuit diagnostic use in mTBI. Baseline metrics and two levels of working memory load metrics are evaluated in conjunction with psychiatric questionnaires and vestibuloocular assessment.

*Results:* This study is in progress, but preliminary results show good discrimination of mTBI participants from healthy controls. Results also show that higher working memory load leads to more eye movement variability in mTBI patients, but not healthy controls. Additionally, correlations between some psychiatric factors and deteriorated eye movement have been elucidated, indicating possible psychiatric confounds not before addressed in the mTBI and eye tracking literature.

# Thursday Oral Presentation Abstracts

Henry Angus 434, 5:00 pm - 6:30 pm

**Title: Response Markers in English: A Corpus-based Study**

**Presenter: Yuan, Yifang**

This paper aims at providing a systematic study of English response markers (RMs) and their distributions in responses to different speech acts. Based on data from the Corpus of American Soap Operas (2,182,777 words), this study first provides a list of the top 10 RM types from our data: YEAH, NO, OKAY, YES, UH-HUH, YEP, NOPE, NAH, UH-OH, YUP. For every RM type, both the bare form and collocate forms are investigated. Based on this list, the present study examines the occurrences of each RM type in responses to eight different kinds of speech acts, i.e., Y/N question, confirmational, rising declarative, assertion, command, exclamation, addressing and Wh-question. After comparing and analyzing the distributional patterns among all the positive RMs and negative RMs, our study shows that RMs can be used as responses to all the speech acts listed above, with significant differences among distribution patterns of each RM type: (a) except for bare yep, all bare positive RMs can be used as responses to the above eight categories of speech acts; and (b) all other RM types are used in response to particular speech act categories. These findings are different from most previous studies which claimed that polarity particles can only respond to assertions and Y/N questions. More important, by using a corpus-based approach, this study provides a comprehensive and empirically-supported account of response markers used in English.

# Thursday Poster Presentation List

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Irving K. Barber Learning Center - 2nd Floor Foyer

**Use of Centralized Electronical Patient Records System in Paediatric Care**

Bo, Jessica; Janusz, Nicole & Tsang, Vivian

**Can Turning Charitable Giving into a “Teachable Moment” Increase Prosocial Spending Among Parents?**

Camporeale, Teece

**C-reactive Protein Levels in Depression Patients Post TMS Treatment**

Chau, Briana

**Environmental and developmental regulation of photosynthetic and transpiration rates, and leaf senescence in *Catalpa speciosa***

Chera, Aman

**Gendered Cultural Representations in Canadian Parenting Discourse: A Content Analysis of Today's Parent**

Chow, Alex; Fong, Jodie; Li, Erika & Lee, Juhan

**Knowledge and its Association with Bed Net Use in Children Under 5 Years: Results from the Malaria Indicator Survey, Angola, 2011**

Cruz, Justin; Stewart, Quinn & Leghari, Priya

**Comparison of Discourse Surrounding CRISPR/Cas9 in the Mainstream Media and Peer-Reviewed Literature**

Everett, Dexter; Pan, Jenny & Liu, Alisa

**Structural Differences of the Hippocampus in Major Depressive Disorder Assessed by Magnetic Resonance Imaging**

Ghaseminejad, Farhad

**The Genetic Underpinning of Castration-Resistant Prostate Cancer**

Johnston, Jake

**Differential Effect of Tyrosine Kinase Inhibitors on Activation of Pregnane X Receptor in Human Colon Adenocarcinoma Cells**

Khehra, Keesha

**The destructiveness of perfectionism on group psychotherapy: Examining the role of self-disclosure**

Ko, Ariel

**The effect of IFN-g on monocytes of premature neonates**

Kuo, Grace; Menon, Nikita & Hii, Clare

# Thursday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**A Computational Investigation of Sulfur-Containing Hetero-Calix[4]pyrroles as Macrocyclic Ligands for Dinitrogen Reduction**

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**Perfectionism and Interpersonal Relationships in Group Psychotherapy**

Madia, Chelzea

**A Dual Ligand Targeted Liposomal "Trojan 'Bull' Drug Delivery System" for Glioblastoma Multiforme**

Mangat, Chanpreet & Chu, Valerie

**Eye-Blink Rate as a Proxy of Dopamine and Risk**

Mascarenas, Arantxa & Yoo, Daniel

**Reward Processing in Parkinson's Disease: A Study of Brain Waves**

Molina, George & Serban, Christa

**The short and long-term benefits of providing culturally-relevant health services on patient and participant health outcomes: the InterCultural Online Health Network (iCON)**

Narayan, Shawna & Fung, Alex

**The Influence of Government Bodies and Geographic Location on Motivational Intensity for Contraceptive Use**

Ojo, Timmy

**Role of Cbx 1, 3, 5 in Telomere Position effect of the mouse**

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**Resistant hypertension in thoracoabdominal aortic dissection involving the renal arteries**

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**Assessment of the value of topical administration of caffeine in the treatment of skin cancer**

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Rani, Varsha

**Development of PD-L1-targeting Immunoliposomes For The Treatment of Non-Small-Cell Lung Cancer**

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**Particle tracking in the Strait of Georgia: Iona outfall effluent transport pathways**

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# Thursday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**Identifying High Potential Peridot-Gemstone Sites in BC**

Shang, Pattie & Lam, Joyce

**Oxygenation and Nerve Regrowth: Hypoxia signaling and axonal regeneration**

Smaila, Brittney

**The Quest for Clean Air: A Feasibility Study of Converting Diesel School Buses to All-Electric in School District 46 of Sunshine Coast**

Tannason Ng, Stuart; Fu, Sylvester & Chen, Wenhao

**The Impact of Prostate Cancer Treatments on Men's Sense of Manhood: Implications for Understanding Masculinity**

Tsang, Vivian

**Insulin Signaling Possibly Regulates Aging Neuromuscular Synapses**

Wang, Jane

**Influence of immune cell populations in a murine model of multiple sclerosis and Epstein-Barr virus latent infection**

Wang, Angela

**Hidden and Homeless: Towards understanding the vulnerabilities of women experiencing homelessness**

Wanniarachchi, Senara; Sarai, Aninder & Kouassi, Ornella

**Machine Learning for Identifying Genes Responsible for Alzheimer's Disease**

West, Peter

**Effects of rTMS treatment on Sleep Patterns in Patients with Depression.**

Wigisser, Joane

**Role of the Interleukin-7 Family of Cytokines in Influenza Infection**

Yau, Clement

**Caffeine & Alzheimer's Disease: A novel avenue for treatment delivery**

Young, Stacey

**Narrative: Source of Visual Misdirection?**

Zhang, Jessie

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Use of Centralized Electronical Patient Records System in Paediatric Care**

**Presenters: Bo, Jessica; Janusz, Nicole & Tsang, Vivian**

Centralized Electronic Medical Record systems (EMR) have potential to provide a variety of benefits to national healthcare systems worldwide. However, their implementation has proven to be challenging and raised several concerns. Although previous work has analyzed the successes and limitations of centralized EMR systems, statistical analysis to quantify user perspective has not yet been conducted. In order to gain a better understanding of the opinions of medical professionals and others in the field regarding their perceived support, benefits, and barriers for a centralized EMR system, a survey was conducted on the participants of the International Paediatrics Association (IPA) 2016 Conference in Vancouver, BC. The survey contained Likert Scale questions, asking participants to rate the importance of listed benefits and barriers, as well as indicate their overall support for centralized EMR systems on a scale of 1 to 5. The data was analyzed using a one-way ANOVA, with a focus on the countries with the greatest number of respondents (USA, Canada, Nigeria, and Mexico). The responses were also categorized and analyzed based on country development. The results indicated that Mexico, as well as other non-developed countries were shown to be most in favour of the EMR system. Fast record access and efficiency were rated as the most significant benefits of a centralized EMR system, while cost and implementation time were perceived as the largest barriers. Implementation time was also rated significantly higher as a barrier by developed countries than non-developed countries. These findings provide useful guidelines for consideration in the implementation of a centralized EMR system, and help in the drive towards improving national healthcare systems worldwide.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Can Turning Charitable Giving into a “Teachable Moment” Increase Prosocial Spending Among Parents?**

**Presenter: Camporeale, Teece**

Spending money on others can lead to significant improvements in happiness (Dunn, Aknin & Norton, 2008). How can prosocial spending be increased? Testing a novel intervention, we examined whether parents would be more inclined to donate hypothetical and actual money to charity if they first taught their children about the importance of giving. In two studies, we randomly assigned parents to make a charitable giving decision either with or without discussing this decision with their child. Next, we measured parents' subsequent donation behaviour. Across the studies (N=420), we found some evidence for our hypothesis, although the results were somewhat inconsistent. These inconsistencies were partly explained by the subtle differences in the ways parents talk to their children about giving, the gender combination of the parent and children as well the overall skill of the parent as noted by our independent coding team.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: C-reactive Protein Levels in Depression Patients Post TMS Treatment**

**Presenter: Chau, Briana**

Depression has been associated with a higher chance of coronary artery disease marked by elevated levels of inflammatory markers such as C-reactive protein (CRP). Studies have shown that depression patients have a significantly higher level of CRP compared to healthy controls (Marion et al., 2003). The objective of this study is to determine the relationship between CRP levels pre and post transcranial magnetic stimulation (TMS) treatment in responsive and non-responsive depression patients. TMS is a non-invasive clinical technique used to treat depression symptoms and is becoming more widespread. Some patients respond favourable to TMS (i.e., their Hamilton Depression Rating Scale scores decline by over 50%) whereas others do not. We analyzed data from 62 depression patients (35 female, 27 male) between ages 18 to 65 whom underwent TMS treatment. Different factors such as age, sex, education level, and normal versus abnormal values of CRP were also incorporated into analysis. We expect results to show a decrease in CRP levels post TMS treatment for responders compared to non-responders; other factors mentioned may play a role. The results of this study will strengthen our understanding of CRP levels in depression patients, thus suggesting implications of using CRP as a possible biomarker for depression.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Environmental and developmental regulation of photosynthetic and transpiration rates, and leaf senescence in *Catalpa speciosa***

**Presenter: Chera, Aman**

An increase in levels of greenhouse gases, such as carbon dioxide appears to induce changes in climate. Carbon can be sequestered by leaves of terrestrial plants by a process known as photosynthesis when carbon dioxide enter the pores of leaves known as stomata. Similarly, stomatal opening allows water loss termed as transpiration, which is important for the circulation of the nutrients within plants. The focus of this study was to examine the effects of environmental and developmental changes on photosynthesis and transpiration rates of Northern Catalpa (*Catalpa speciosa*) leaves during late summer until fall season. As the season changed from summer to fall, the Northern Catalpa leaves started to age. To understand the leaf aging process, I investigated the role of plant hormones in regulating leaf senescence (leaf yellowing) in Northern Catalpa. Photosynthesis and transpiration rates were analyzed by CI-340 Handheld Photosynthesis System. The environmental factors such as precipitation levels, temperature, and photoperiod hours were also noted. Leaf senescence was measured by analyzing chlorophyll and protein levels in the leaves. High temperatures and lower precipitation levels appear to decrease the photosynthesis and transpiration rates of Northern Catalpa leaves. In addition, the photosynthesis and transpiration rates of Northern Catalpa leaves progressively declined during the leaf ageing process, especially the onset of autumnal senescence, which could be due to low temperature and short photoperiod. Therefore, during this period, less carbon was sequestered by Northern catalpa. Plant hormone, auxin delayed senescence and increased the longevity of these leaves, whereas abscisic acid enhanced senescence.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Gendered Cultural Representations in Canadian Parenting Discourse: A Content Analysis of Today's Parent**

**Presenters: Chow, Alex; Fong, Jodie, Li, Erika & Lee, Juhan**

Parents' gender roles are changing as fathers are increasingly expected to take on greater responsibility for child care. Over the past two decades, changes to federal care policy (extension of parental leave) and empirical evidence demonstrating fathers' increased participation in care point to gradual changes in father involvement. Concurrently, research suggests that cultural representations have not kept pace, with mainstream parenting discourse continuing to mainly target mothers and portray fathers as secondary parents. Cultural representations of fathers matter insofar as media both reflects and shapes people's behavior. We therefore investigate whether representations of fathers have kept pace with changes in actual behavior by examining one of Canada's leading parenting magazines, *Today's Parent*. We conducted a content analysis of over 20 years' worth of article titles (96 issues) to see if representations of parenting have changed over time to be more gendered, more gender neutral, or stayed the same. From the gender-neutral category, we further sampled 96 articles and examined their content using the same coding scheme. We find that although article titles have become more gender neutral over the years of 1993 - 2016, the content of parenting magazines has instead become more gendered suggesting that while there are surface attempts to de-gender the culture around parenting, the substantive content of articles still reinforces the dominant ideal of mothers as primary caregivers. We argue that these representations do not match the empirical reality of greater father involvement which could have the impact of dampening fathers' participation in child care.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Knowledge and its Association with Bed Net Use in Children Under 5 Years: Results from the Malaria Indicator Survey, Angola, 2011**

**Presenters: Cruz, Justin; Stewart, Quinn & Leghari, Priya**

Angola, located in western Africa, has been plagued by internal conflict, poverty, and endemic diseases, specifically malaria. Half of hospital patients suffer from malaria, and because of inadequate treatment options, it is pertinent that the focus is in preventative-based initiatives such as the use of bed nets - especially in children under 5 (CU5). To establish malaria knowledge and beliefs we analysed data for Angolan women aged 15-49 with children under 5 to understand the relationship between knowledge of malaria transmission and the use of bed nets. The Angola Malaria Indicator Survey is a nationally representative, population-based survey conducted January - May, 2011 in 4 epidemiologic regions. The survey is cross-sectional with 8,589 women aged 15-49 interviewed. Among 5,231 respondents in our analytic sample we found 52.2% (n = 2,776) do not own a bed net. Of the respondents with bed nets, 87.4% (n = 2,122) indicated that mosquito bites are a cause of malaria, the remaining cited other reasons such as contaminated food as the cause. After adjusting for age, education, and region, those reporting mosquitos as a cause of malaria have 1.7 (95%CI: 1.3-2.2) times the odds of bed net use by CU5 than those not reporting mosquitos as a malaria cause. This study provides evidence of a link between knowledge of malaria transmission and the use of bed nets, and therefore public health efforts in Angola should focus on improving knowledge and promoting bed net use in order to combat the malaria epidemic in Angola.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Comparison of Discourse Surrounding CRISPR/Cas9 in the Mainstream Media and Peer-Reviewed Literature**

**Presenters: Everett, Dexter; Pan, Jenny & Liu, Alisa**

The invention of the CRISPR/Cas9 technique has proven to be a very important development in modern day genetics research. Potential uses of CRISPR/Cas9 include somatic cell therapy for the prevention of various diseases and building organs for human transplants. This study will compare the portrayal of CRISPR/Cas9 in print media and scientific review articles to determine how the media covers CRISPR/Cas9 relative to its overall discussion in scientific literature. Historically, mainstream media has exaggerated the benefits of scientific advancements while ignoring their challenges. Given the potential of CRISPR/Cas9, we suspect the temptation to oversell its benefits is quite high. While most gene editing techniques are typically expensive and cumbersome, CRISPR technology offers a much cheaper and efficient way to edit DNA. However, CRISPR/Cas9 does have risks, such as its ability to accidentally alter parts of the genome that are not meant to be edited. Risks like these should be highlighted by the mainstream media if we are to thoroughly understand what this technology can do for us. We will survey newspaper articles from Factiva (n=60) and scientific review papers from Pubmed (n=30) using a predetermined set of keywords and phrases from 2005-2017. Our coding scheme will consist of 10 questions, which will be developed after a preliminary content analysis of a small subset of each article sample to derive prominent themes to investigate. We will use descriptive statistics to compare the data from the newspaper and peer-reviewed sample sets to determine any statistically significant differences between the groups.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Structural Differences of the Hippocampus in Major Depressive Disorder Assessed by Magnetic Resonance Imaging**

**Presenter: Ghaseminejad, Farhad**

Major Depressive Disorder (MDD) is a prevalent and chronic condition characterized by low mood, lack of enjoyment, and cognitive impairments. The Hippocampus, a neural structure located in the medial temporal lobe of the brain, has been found to decrease in volume in patients suffering MDD. This investigation aims to perform a volumetric and structural analysis of the hippocampus using Magnetic Resonance Imaging (MRI) in both MDD patients and healthy controls. Furthermore, the methods used in this study allow for a quantitative comparison between manual and automated segmentations of the hippocampus, which are widely used methods to exclude the region of interest in MRI images. 18 MDD patients and 19 healthy subjects were recruited and MRI data were collected from all participants. In order to analyze the differences in volumes and structures of the hippocampi, both manual and automated segmentation methods were performed. Manual outlining done by expert raters is the most validated procedure used to estimate hippocampal volumes and it is also used as a standard against which the automated segmentation algorithms are assessed. The results demonstrate a significant hippocampal volume loss in MDD patients compared to healthy controls. Besides, the automated segmentation outcomes of the FreeSurfer software were validated with significant reliability by the manual segmentations. However, to specify the exact locations of degenerations and possible regenerations further spatial and morphological analyses need to be done. Exploring definitive and visible effects of MDD on the human brain will ultimately improve the precision of diagnosis and the efficacy of treatments.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Socio-cultural Roots of the Type II Diabetes Epidemic Within Canadian Indigenous Peoples**

**Presenter: Johnston, Jake**

Indigenous peoples within Canada have long been the victim of mistreatment by the government and society, including medical professionals. Forced introduction of western principles into Aboriginal communities created profound destruction of their culture and traditions, giving rise to an array of health issues. Little research has been done relating the surge of type II diabetes mellitus in Canadian Aboriginal peoples to socio-cultural alterations caused by colonization. I examined a variety of peer-reviewed papers in health and sociology journals to draw logical connections between socio-cultural disruptions of indigenous peoples and the prevalence of type II diabetes within the Canadian indigenous population. Furthermore, I examined de-identified data published from the Aboriginal Peoples Survey conducted by Statistics Canada. Close examination of historical damage inflicted by the government on Aboriginal peoples indicates possible links between both residential schools and the reserve system both directly and indirectly giving rise to type II diabetes mellitus through replacement of Aboriginal culture; this led to turmoil, poverty and breakdown within traditional practices of First Nations health, nutrition, and physical activity. A possible method of controlling diabetes mellitus in indigenous peoples is promotion of traditional Aboriginal practices, including the cultural diet and physical activity practices which were disrupted by western colonization.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Differential Effect of Tyrosine Kinase Inhibitors on Activation of Pregnane X Receptor in Human Colon Adenocarcinoma Cells**

**Presenter: Khehra, Keesha**

Tyrosine kinases are enzymes that regulate many cell functions, including growth, division, and signaling. These enzymes may be found at high levels in some types of cancer cells, and blocking them using tyrosine kinase inhibitors (TKIs) may prevent these cancer cells from growing. However, TKIs can be metabolized by a wide range of enzymes in the body, including the cytochrome P450 group: 3A4, 2B6, and 24A1. Activation of the nuclear receptors hPXR, hCAR, and hVDR leads to an increase in expression of CYP3A4, CYP2B6, and CYP24A1, respectively. Changes in expression of these drug-metabolizing enzymes affect the intracellular pharmacology of many therapeutic agents, such as TKIs. The mechanism of action of these drugs is still unclear, especially in regards to the development of resistance during chronic TKI use. We investigated the effects of four anti-cancer TKIs: erlotinib, gefitinib, nilotinib, and vandetanib on the activity of nuclear receptors and the expression of CYP3A4 and CYP24A1 mRNA in human colon cancer cells. The cells were subject to 24 hour and 48 hour drug treatment, after which the expression of the mRNA was quantified using real-time polymerase chain reaction (qPCR). Among the four TKIs investigated, only erlotinib significantly activated hPXR while all four induced CYP3A4 mRNA expression. Gefitinib, nilotinib, and vandetanib were also associated with induction of CYP24A1 expression. Since hPXR has been found to be expressed in multiple human tumors, our findings that erlotinib increases hPXR activation and CYP3A4 expression may have implications in the design of effective anti-cancer therapies.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The destructiveness of perfectionism on group psychotherapy: Examining the role of self-disclosure**

**Presenter: Ko, Ariel**

Group psychotherapy provides a supporting environment for individuals to disclose intimate and personal issues. Self-disclosure in group psychotherapy is vital to achieving successful treatment outcome and establishing a strong therapeutic relationship with the clinician. However, research has shown that perfectionistic individuals often refrain from displaying or disclosing perceived imperfections with others in fear of social rejection and humiliation but such behaviours make it difficult to sustain fulfilling interpersonal relationships. Furthermore, perfectionistic individual's interpersonal sensitivity to critical judgments influences their perception of the clinical experience as threatening, so they might not feel safe in disclosing personal information about the self, and this often interferes with the psychotherapy process and outcome. Given the destructiveness of perfectionism, it is crucial to examine whether perfectionism affects self-disclosures in group psychotherapy. 70 participants from the University of British Columbia Treatment of Perfectionism Study received ten sessions of group psychotherapy aimed at reducing perfectionistic behaviours. Participants were screened and assessed to select those who scored at least one standard deviation above community samples in at least one dimension of perfectionism. Three selected sessions were scored for frequency and depth of self-disclosures. We hypothesize that highly perfectionistic individuals will have fewer personal self-disclosures, and a lower depth of revealing. Consistent with our predictions, our findings show that individuals high in socially prescribed perfectionism (perception that others require one to be perfect) exhibited lower personal self-disclosures. Surprisingly, nondisclosure of imperfections (hiding perceived imperfections from others) was significantly associated with more frequent and negative self-disclosures. Given that openness during therapy is key to successful treatment outcome, this study can contribute to improving therapeutic outcomes for perfectionistic individuals by determining how and to what degree perfectionism can limit self-disclosures in psychotherapy.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The effect of IFN-g on monocytes of premature neonates**

**Presenters: Kuo, Grace; Menon, Nikita & Hii, Clare**

Preterms are babies born before reaching 37 out of 40 weeks of pregnancy and are especially prone to lethal infectious diseases depending on how low their gestational age is. Their underdeveloped immune system is unable to initiate a pro-inflammatory response when exposed to pathogens. The cytokine, IFN-g (a protein secreted by activated immune cells) is known to reactivate the unresponsive immune cells in adults by initiating recovery of a pro-inflammatory response. These unresponsive immune cells constitute immunoparalysis, a condition often associated with sepsis, where bacteria and toxins are found circulating in the blood stream. Immunoparalysis in sepsis patients can be compared to the underdeveloped immune system of premature neonates. Through this research project, we hope to gain understanding on whether IFN-g will induce a similar effect on immune cells, particularly monocytes, in premature babies born <32 weeks of gestation. In order to address this question experimentally, monocytes from preterm neonates, full-term neonates, and adults will be pre-treated with IFN-g and incubated in LPS (which simulates a bacterial infection). Using flow cytometry, the cytokines and HLA-DR expression levels, which are indicative of a functioning immune response, are measured and compared amongst the groups. Based on a literature review, we predict that the pretreatment of monocytes with IFN-g will increase HLA-DR expression and increase production of pro-inflammatory cytokines. Preliminary results will be presented, nonetheless, the limitations of the experiment include the small sample size, inappropriate IFN-g incubation time and IFN-g dosage. The study will allow us to better orient future clinical pharmaceutical, and therapeutic research for reducing neonatal mortality, thereby improving the health outcomes of the premature neonates.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: A Computational Investigation of Sulfur-Containing Hetero-Calix[4]pyrroles as Macrocyclic Ligands for Dinitrogen Reduction**

**Presenters: Li, Jessica; Tilman, Michael & Garland, Olivia**

Although 78% of the atmosphere is comprised of molecular dinitrogen, few reaction mechanisms are known to allow the thermodynamically favorable reduction of dinitrogen into ammonia, an important precursor of nitrogen-based fertilizers. Harsh temperature and pressure conditions are required for the Haber process, which is used for the industrial production of ammonia. To provide the energy for this process, non-renewable fossil fuels are burned. By contrast, certain bacteria produce nitrogenase enzymes that catalyze nitrogen fixation, reducing the energy barrier of the reaction such that it can occur under ambient conditions. Because nitrogenase contains several iron-sulfur clusters, synthetics mimic of nitrogenase often contain Fe and S as well. We propose a novel reaction mechanism for the reduction and fixation of dinitrogen by an iron calix[2]thieno[2]pyrrole-dinitrogen complex, with the aim of investigating the stability effects of using a macrocyclic sulfur-containing ligand. Furthermore, AM1 theory is used to determine the electronic structure of the calix[2]thieno[2]pyrrole ligand.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Perfectionism and Interpersonal Relationships in Group Psychotherapy**

**Presenter: Madia, Chelzea**

Perfectionism is a personality trait characterized by the need to attain flawlessness and has been linked with less clinical improvement of patients in individual therapy. Existing literature presents minimal explanation as to how and why perfectionism impedes treatment. In particular, there has not been a thorough investigation of perfectionism's influence on therapeutic relationships (i.e., group cohesion, client-group members relationships). Thus, the current study examines the relationship between perfectionism and group cohesion in group psychotherapy with the application of the Perfectionism Social Disconnection Model (PSDM), a framework that hypothesizes that perfectionistic individuals develop behaviors which are aversive to others, resulting in social alienation and rejection. This is important to enhance understanding of perfectionism and how its interaction with therapeutic relationships impacts a dynamic group-structured therapy. Sixty-one individuals participated in the UBC Perfectionism Study that ran for 10 sessions using a Psychodynamic/Interpersonal approach. Three measures of perfectionism were administered before the treatment and Group Climate Questionnaire assessing group cohesion was completed each session. Correlational analyses assessed the relationship between perfectionism and group cohesion in Session 3 and Session 8. Findings show that perfectionism is moderately associated with interpersonal conflict and distrust among group members, negatively influencing group cohesion.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: A Dual Ligand Targeted Liposomal “Trojan ‘Bull’ Drug Delivery System” for Glioblastoma Multiforme**

**Presenters: Mangat, Chanpreet & Chu, Valerie**

Glioblastoma multiforme is the most aggressive and common form of brain cancer. Current therapeutics do not effectively reach the tumour site due to the highly selective blood brain barrier (BBB). To transport a drug through the barrier, we must exploit the fact that the BBB is permeable to certain molecules. Low density lipoprotein (LDL) receptor, found on endothelial cells that make up the BBB, recognizes proteins and permits their entry. A drug delivery system was designed that takes advantage of the LDL receptor’s ability to permit certain molecules passage from circulation into the brain. Modified liposomes were used as the drug delivery vehicle. We added an additional protein to the liposome to target the tumour site. The liposomes were taken up by the tumour cell in a way that allows the liposome to be digested in lysosomes and allowing the drug’s release. In order to free up interaction space for our cancer-targeting proteins, we also added a component that released the LDL proteins from the liposome upon their entrance into the brain. We confirmed the structure using cell cultures that mimic tumour cells and the BBB. Through our experiment’s results, we showed positive uptake of our liposomes into cancer cells and we showed potential in the use of LDL receptors to get inside the brain.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Eye-Blink Rate as a Proxy of Dopamine and Risk**

**Presenters: Mascarenas, Arantxa & Yoo, Daniel**

Dopamine D2 receptors might influence risky behaviour. While animal research has provided direct evidence linking individual risk preference with D2 receptor density and D2-related signalling, there has only been indirect evidence supporting these links in humans. For example, some Parkinson's disorder patients engage in high-risk behaviours while on D2 receptor agonist therapy, and substance dependent individuals have been repeatedly shown to have reduced D2 receptor density. Assessing these relationships in humans directly requires costly D2 receptor imaging in combination with sensitive paradigms. However, a recent study of monkeys demonstrated high correlations between eye-blink rate (a dopamine dependent behaviour) and D2 density, suggesting the former may be used as a proxy for the latter. Our aim is to evaluate the relationship between eye-blink rate (as a proxy estimate of D2 receptor density) and several cognitive components of risk-taking behaviour measured via two laboratory controlled gambling experiments. These components include sensitivity to reward value, loss and probability information. We will examine these relationships in 131 volunteers who previously performed these tasks accompanied by eye tracking. We hypothesize that some of the measured cognitive components of risk-taking behaviour will correlate with blink rate, suggesting that these components might be D2-dependent. These findings will contribute to identifying specific candidate D2-dependent features of risky behaviour, which can be later used in neuroimaging studies to interrogate these brain-behaviour relationships directly. In other words, in the blink of an eye, we hope to soon be able to better understand the connection between dopamine receptors and high risk behaviour.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Reward Processing in Parkinson's Disease: A Study of Brain Waves**

**Presenters: Molina, George & Serban, Christa**

Parkinson's disease (PD) is associated with the degeneration of dopamine neurons and multiple motor and cognitive impairments. In particular, PD patients are impaired in tasks that require learning from positive and negative feedback i.e., reinforcement learning. Reinforcement learning is governed by a system of brain areas that use dopamine signals to learn outcome values and select actions. Event-related potentials that are observed from electroencephalography (EEG) recordings have revealed a component called "reward positivity", a negative deflection in the ERPs that is larger for negative outcomes compared to positive outcomes in healthy individuals. This component is proposed to reflect dopamine activity that drives reinforcement learning. Using EEG, we aim to understand how reward positivity is influenced in PD. EEG will be recorded from twenty PD subjects off medication and twenty age- and gender-matched healthy subjects while engaged in a computer task with High and Low probabilities of Positive and Negative outcomes on each trial. We hypothesize that the amplitude of reward positivity will be less sensitive to outcome probability in PD compared to healthy control subjects. We predict that the reward positivity measured as the difference between ERPs to negative outcomes compared to positive outcomes will be sensitive to the probability of outcomes in healthy subjects but not in PD.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The short and long-term benefits of providing culturally-relevant health services on patient and participant health outcomes: the InterCultural Online Health Network (iCON)**

**Presenters: Narayan, Shawna & Fung, Alex**

Despite the apparent ubiquitous reach of the current healthcare structure, many cultural groups feel segregated from this system due to barriers including language, literacy levels and lack of culturally-relevant (CR) health services. Health research has demonstrated that patient-engagement is optimal in the management of disease, and some studies have highlighted the importance of providing tailored, relevant health information to patients. This project elucidates the effectiveness of providing CR health services at facilitating participant changes in learning, attitudes, behaviors and actions relating to mental health. Following a CR mental health workshop in the community, we tracked a cohort of 315 Chinese and Punjabi community-members and compared their pre-workshop answers to survey questions to post-workshop answers in order to demonstrate the impact the workshop—a CR health service—has in creating change in participant knowledge and beliefs about mental health. Furthermore, semi-structured interviews were conducted one-month post-workshop to illuminate the transferable learning, skills, long-term impact and changes that the CR health service provides to participants. Results from these follow-up interviews indicate that 61% of participants display at least one behavioral change as a result of gaining access to this CR health service, and that many of them have increased their knowledge or altered their attitude towards mental health. There is also a 27% increase in participants that know where to access health services when needed. These findings support the continued implementation and delivery of CR health services to the community in order to improve health outcomes and potentially reduce healthcare costs.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: The Influence of Government Bodies and Geographic Location on Motivational Intensity for Contraceptive Use**

**Presenter: Ojo, Timmy**

Psychologists define motivational intensity as “the urge to move toward or away from a stimulus”, and deploy the concept to broaden our understanding of mental processes undertaken prior to executing an action. For instance, joy sparks the urge to play, and has a low motivational intensity as it broadens our cognitive scope. Despite ample research on the theoretical concept of motivational intensity, insufficient research examines its practical implications. Specifically, motivational intensity relating to contraceptive use has not been studied, even though the universal movement towards family planning and greater access to contraceptives has preoccupied scholars for decades. Focusing on this movement, and noting its stark variations across geographic areas, the first part of this study identifies the overlooked connection between geographic location and consequent likelihood, or motivational intensity, of couples to engage in family planning. I address the linkage between socio-economic status, which varies per geographic location, and motivational intensity for contraceptive use by drawing on evidence from the World Bank estimates of 2016 Gross Domestic Product per capita., and subsequently analyzing this in relation to birth rate accounted for by the CIA. Second, I highlight motivational intensity on a scale that represents the aim of government bodies to utilize family planning as a tool to tackle societal difficulties, such as under-utilization of a nation’s economic capacity. By examining a Twitter thread which reveals the intent of government bodies, I broaden the scope of motivational intensity in the context of contraceptive use, challenging the notion of it as narrowed primarily to women. This research is limited by its measurement of birth rate as an indication of contraceptive use, as it ignores other factors which could cause a surge in birth rate. Nevertheless, this research highlights a positively-correlating relationship between motivational intensity and contraceptive use, while accounting for the influence of socio-economic status and the pressures exerted by government bodies.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Role of Cbx 1, 3, 5 in Telomere Position effect of the mouse**

**Presenter: Okawa, Sean**

Telomeres are specialized DNA sequences at the end of linear chromosomes, implicated in protection from erosion and thereby longevity of organisms. Telomere position effect (TPE) refers to reversible silencing exerted by telomeric heterochromatic regions on neighboring genes. TPE has been observed in several different model organisms, but very little is known about its regulation. By studying TPE, we hope to learn about the genetic and epigenetic factors implicated in telomere biology and epigenetic silencing. A particular family of genes encoding a series of well-conserved proteins known as chromobox (Cbx) genes has previously been characterized to induce gene repression by heterochromatin formation (a region of DNA which is often suppressed or inactive). We hypothesize that these genes may increase the silencing mechanism of TPE. Our lab has developed a unique system, in which TPE can be observed and quantified, to study factors associated in TPE in mouse embryonic stem cells (ESCs). With this system we hope to shed light on the mechanisms and regulation of TPE, using particular genes of interest such as the three Cbx paralogues.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Resistant hypertension in thoracoabdominal aortic dissection involving the renal arteries**

**Presenters: Parmar, Sunjit & Parmar, Simran**

Hypertension control is important for patients with thoracic aortic dissections (TAD) and presumably even more important in patients with extensive dissections extending into the abdominal aorta (thoracoabdominal aortic dissections or TAAD). In this retrospective chart review of 42 patients attending an aortic diseases clinic, 21 patients having TAD involving the renal arteries were age and sex matched 1:1 with controls having TAD without extension to renal arteries. Cases involving the renal arteries were found to be associated with an increase in resistant hypertension (rHTN). Nevertheless it was observed that with more antihypertensives, especially angiotensin-receptor-blockers, blood pressure in this group can be controlled to levels seen in the control group. Cardiac risk factor analysis from patient charts also revealed that coronary artery disease was associated with TAAD's involving the renal arteries. Finally, we determined that there is clinical value in sub-classifying TAAD's based on source of renal blood supply since certain patient groups had higher rates of rHTN, requiring more aggressive antihypertensive therapy.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Assessment of the value of topical administration of caffeine in the treatment of skin cancer**

**Presenters: Pattanshetti, Ritu; Wong, Emily & Uday, Prakruti**

The aim of this study was to compile available data on the efficacy of topical administration of caffeine on the reduction of cancerous skin cells and explore the mechanism involved in caffeine promoting an increase in cell death, also known as cell apoptosis. Skin cancers can be broadly classified into two categories: non-melanoma and melanoma skin cancers. The risk of developing any of the two types of skin cancer is increased from exposure to UVB rays, present in sunlight. Treatment of cancerous skin cells mostly involves invasive procedures such as surgery, chemotherapy and radiation, biological or photodynamic therapy, which weaken a patient's immune system and makes them susceptible to other diseases. An effective non-invasive method of treatment and prevention of skin cancer, in the form of topical application of caffeine, would greatly improve the patient's quality of life, as well as preventing secondary disease complications. Caffeine may be used as a cheap alternative to expensive drugs currently used to treat skin cancer. Studies have shown that caffeine can promote cell apoptosis of UVB damaged cells by arresting cell division, or mitosis, thus preventing the uncontrolled division of abnormal cells that eventually leads to the development and formation of tumors. Furthermore, the application of caffeine showed no adverse effect on non-tumor cells. In this study, we assess various published studies of caffeine as a skin cancer treatment in both in vitro models (ie. human cancer cell lines) and in vivo models (ie. mice) to determine whether it is a viable clinical option.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Temperature Dependence of Cardiac Function in an Isolated Heart of a Rainbow Trout**

**Presenter: Rani, Varsha**

Global climate change is predicted to drive some of the fish species to extinction but not the others. Therefore, determining which species and why is paramount for food security. Fish hearts tolerate different body temperatures to different degrees depending on the species, but all studies to date show that fish increase heart rate during warming, so that the tissues receive more oxygen to support the increased metabolic rate. Unfortunately, the capacity of the heart to distribute oxygenated blood is limited. Hence, my research tested the hypothesis that fish die when the temperature is too warm because the performance of the heart itself becomes limited. I studied the intrinsic beating properties of the working isolated trout heart perfused by aerated physiological saline solutions. The temperature of the heart was progressively increased over several hours while measuring the ECG and cardiac output until cardiac arrhythmia was observed. I discovered that once high temperatures began to induce cardiac arrhythmia, both the heart rate and cardiac output decreased. This demonstrates that an upper thermal limit could potentially reduce the amount of oxygen received by the tissues in live fish. This is the first time that this experimental approach has been used to examine the upper thermal limit for heart function in any animal. Moreover, this approach can be further expanded to explore the regulatory processes that occur at these upper limits.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Development of PD-L1-targeting Immunoliposomes For The Treatment of Non-Small-Cell Lung Cancer**

**Presenters: Sahota, Anahat; Ahmed, Azim; Kallo, Zsofia & Wu, Ivy**

One in four cancer-related deaths is attributed to lung cancer. Most patients are diagnosed with inoperable Non-Small Cell Lung Cancer (NSCLC) and have a 1-5% five-year survival rate. There has been little improvement in overall survival rates for NSCLC owing, in part, to the emergence of drug resistance to both conventional and targeted agents. Immunotherapeutics, like PD-1 inhibitors, have contributed towards increasing survival rates when combined with standard chemotherapy. The use of these combinations in targeted drug delivery systems, however, has not been explored. Here, we propose to assess the use of PD-L1-targeting immunoliposomes to deliver Carboplatin (CBDCA) and Paclitaxel (PTX) for the treatment of NSCLC. We hypothesize that delivering Carboplatin and Paclitaxel in singly formulated liposomes coated with Avelumab (a human antibody against PD-L1- the co-receptor to PD-1 on tumor cells) will increase the efficacy of the drugs targeting the tumor, increasing tumor cell death at lower toxicities. Liposomes comprising EggPC/Chol/PEG2000-DSPE (65:34:1.0 molar ratio) will be prepared by standard extrusion methods. Avelumab will be conjugated to Mal-PEG2000-DSPE micelles and transferred to liposomes containing CBDCA or PTX. The candidate formulations will be tested in-vivo in mice for their safety and pharmacokinetic profiles. Finally, biodistribution and efficacy studies will be performed using syngeneic mouse models. The formulations are expected to leverage the passive and active targeting properties of immunoliposomes, resulting in enhanced treatment outcomes with minimal side effects. This study will serve as a proof-of-concept for the development of clinically relevant immunoliposomes for treatment of NSCLC.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Particle tracking in the Strait of Georgia: Iona outfall effluent transport pathways**

**Presenter: Sgarbi, Giorgio**

The Iona outfall is responsible for more than 40% of the Greater Vancouver Sewerage and Drainage District's discharge. This study aims to understand fluid paths close to the Iona outfall. This goal has become especially relevant after recent observations showed elevated bacterial counts to the south of the outfall. This finding challenged the assumption that discharge was carried to the north by prevailing currents. Understanding of the fluid trajectories in this region is crucial to designing sampling protocols that accurately monitor the environmental impact of the outfall. We therefore seek to understand the frequency and drivers of southward flows near the outfall through numerical simulation. Simulations are based on a Nucleus for European Modelling of the Ocean (NEMO) model for the velocity field in the Salish Sea with Ariane, an offline Lagrangian particle tracking tool. Our results show southward transport on July 19 and August 2016, 2016, consistent with observations of elevated bacterial counts south of the outfall on those dates. Based on the simulations conducted so far, these events are deviations from the more frequent northward trajectories.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Identifying High Potential Peridot-Gemstone Sites in BC**

**Presenters: Shang, Pattie & Lam, Joyce**

Interested in bling-bling objects? This project shows where you can potentially find some gems in BC. Peridot is the best-known gem form of olivine which occurs in the color green. It's commonly used in modern jewelry and gains popularity for being the birth stone of August. Peridots are found in igneous rocks, which form from lava eruption at the earth's surface (e.g. Volcanoes). Situated in the "Pacific Ring of Fire", BC has a rich history of volcanic activities. This leads to the development of Chilcotin Group Basalt (CGB) - a large "igneous province" spanning 3300 km<sup>2</sup> that potentially contains Peridot.

In order for individual explorers to mine effectively, two constraints can be set to narrow down the sites inside the vast CGB - rock exposure and accessibility. Using Geographic Information System (GIS), this project locates sites inside the CGB that are close enough to road networks, and where slopes are steep enough for rocks to be exposed. According to results, identified sites sum to a total of 77km<sup>2</sup>. Biggest regional cluster that contains half of the total sites is located at the 8-provincial park region. Site which is the closest to Vancouver is the tiny Otter Lake site. Site that has the best combination of infrastructure and proximity is the Kelowna site. More results in the map produced.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Oxygenation and Nerve Regrowth: Hypoxia signaling and axonal regeneration**

**Presenter: Smaila, Brittney**

Prolyl hydroxylase domain (PHD) proteins act as oxygen sensors within cells. Under normal oxygen conditions (normoxia), these proteins act to degrade a group of proteins called hypoxia inducible factors (HIF). However, in conditions of low oxygen (hypoxia), HIF proteins have a variety of functions, many of which may contribute to healing after injury. Previous studies have shown that transgenic animals lacking PHD proteins, whose cells are constantly in a state of hypoxia, regenerate nerves more quickly than wildtype animals, whose cells contain PHD proteins and are maintained in a state of normoxia. This study aims to show phenotypic evidence of this difference in speed of regeneration through several behavioural tests using transgenic and wildtype mice. Behaviour is measured both before a crush-injury to the sciatic nerve innervating the left hind limb, and after the injury begins to heal. We hypothesize that mice lacking the PHD proteins will show behavioural evidence of quicker nerve regeneration than wildtype mice.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Quest for Clean Air: A Feasibility Study of Converting Diesel School Buses to All-Electric in School District 46 of Sunshine Coast**

**Presenters: Tannason Ng, Stuart; Fu, Sylvester & Chen, Wenhao**

As a major emitter of greenhouse gases and atmospheric pollutants, diesel transportation exacerbates climate change and pose significant health risks - especially to vulnerable groups such as elderly and children. Transitioning to electric transportation is an effective approach in lowering harmful emissions and reducing the risk of developing cardiovascular and respiratory-based diseases. Thus, the application of hybrid-electric buses to urban and suburban areas are receiving growing attention from different local and global agencies and groups. However, there is limited research pertaining to assessing schoolchildren's exposure to pollutants emitted by diesel-powered school buses when on board the bus and when idling at bus stops. Economic feasibility studies of replacing diesel with electric buses are crucial in influencing the decision of purchase, while existing studies are large in scale and not necessarily specific to a location. In partnership with The Sunshine Coast Clean Air Society, this project examines schoolchildren's exposure to particulate matter (specifically fine particles whose diameter falls between 0.5 and 2.5 micrometers) emitted from diesel-powered school buses in Sunshine Coast School District 46 (SD46) using the Dylos 1700 Air Quality instrument. It also assesses the financial feasibility of switching to electric buses based on an SD46-specific cost-benefit analysis. Although the project is ongoing, preliminary findings indicate that the transition to electric buses is feasible in the presence of vehicle-to-grid revenues with a positive net present value. In addition, ANOVA statistical analysis reveals that the particulate concentrations within the buses are significantly higher in the buses than at the school stops.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: The Impact of Prostate Cancer Treatments on Men's Sense of Manhood: Implications for Understanding Masculinity**

**Presenter: Tsang, Vivian**

*Background:* Men, who undergo prostate cancer (PCa) treatment, commonly report a diminished sense of their manhood. However, the ways in which this is characterized by patients compared to researchers are not necessarily congruent. Here the PCa literature was examined for these differences and used the changes reported as emasculating as a way to explore what features are most commonly recognized as definitional to masculinity.

*Methods:* Data was extracted from 42 peer-reviewed articles from health-related databases that included the words "prostate cancer" as well as terms associated with manhood and masculinity. The characteristics most commonly associated with reduced masculinity were ranked and evaluated for whether they reflected biological features (e.g., ability to achieve an erection) or social norms (e.g., being a protector or breadwinner) as well as whether they were derived directly from patient narratives, or academic literature.

*Results:* There is a substantial difference between what patients emphasized versus characteristics drawn from established masculinity scales. From the patients' perspective, the greatest impairments to their manhood from PCa treatments dealt specifically with bodily functions with a clear underlying biological basis. Erectile function was the most commonly patient-identified characteristic associated with masculinity followed by high libido, physical strength, and having control of pelvic visceral functions.

*Conclusion:* Characteristics defining masculinity were different when described by patients compared to researchers. Most masculine characteristics identified by patients were biological whereas those defined by researchers aligned with the sociological understanding of masculinity. This was most evident in studies that included patients on androgen deprivation therapy.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Insulin Signaling Possibly Regulates Aging Neuromuscular Synapses**

**Presenter: Wang, Jane**

Aging is associated with progressive neuronal dysfunction; however, the mechanisms and regulatory pathways in the maintenance of neural circuits have yet to be determined. If found, this information could provide many potential therapeutic benefits. Recently it has been suggested that insulin signaling is involved in aging. My goal was to investigate the possible role of insulin and aging in the maintenance of synapse patterning. Using *C. elegans* as the model organism, I looked at two mutants of the insulin signaling pathway, *daf-2* (which normally encodes an insulin receptor) and *daf-16* (which normally encodes the downstream transcription factor). In *C. elegans*, each motor neuron restricts its synapses to a distinct segment of the muscle. This is termed "synaptic tiling." I quantified the number of worms with this overlapping phenotype at different life stages to compare the onset of the synaptic tiling defect in *daf-2* mutants, *daf-16* mutants, and wildtype worms. I found that wildtype worms show age-dependent disorganization of synaptic tiling, characterized by overlapping synaptic domains of two adjacent motor neurons (DA8 and DA9). This means the older the worm, the more disorganized its synapses. I also found that *daf-2* mutants show a later onset of the synaptic tiling defect than wildtype worms and *daf-16* mutants show an earlier onset than wildtype worms. These results indicate that insulin signaling is indeed involved in the maintenance of synapse patterning.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Influence of immune cell populations in a murine model of multiple sclerosis and Epstein-Barr virus latent infection**

**Presenter: Wang, Angela**

Multiple sclerosis (MS) is an inflammatory central nervous system (CNS) disease that has mostly been attributed to autoimmunity, characterized by damage of myelin sheaths around nerves. Canada currently has the highest rate of MS in the world, however little is known about the mechanisms for development aside from having both environmental and genetic factors. Amongst environmental factors, previous infection with Epstein-Barr virus (EBV) is believed to contribute to MS development. EBV establishes a lifelong latent infection within memory B cells and is occasionally reactivated throughout the individual's life. Previous findings from our lab have demonstrated that latent HV-68 infection enhances autoimmunity through modulating dendritic cells and suppressing T regulatory cells, ultimately leading to increased EAE severity. Furthermore, histology of brains and spinal cords reveal more severe demyelination and higher levels of immune cell infiltration. This project investigates the influence of different immune cell types on EAE pathology in mice that are latently infected with HV-68 by histology. EAE is induced after establishing a latent infection in interferon-alpha receptor (IFNAR) knockout mice or wild type mice that is depleted of CD8+ T cells or B cells. At two weeks post-induction, brain and spinal cords are harvested, embedded in paraffin, then sectioned for staining with eriochrome cyanine R or hematoxylin and eosin. EAE severity is evaluated through the extent of CNS demyelination and clinical scores. We hypothesize that since CD8+ T cells and B cells are involved in pathology, depletion of these cell types can ameliorate disease severity.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Hidden and Homeless: Towards understanding the vulnerabilities of women experiencing homelessness**

**Presenters: Wanniarachchi, Senara; Sarai, Aninder & Kouassi, Ornella**

Women are among the fastest growing population of homeless persons today and represent up to one-third of the homeless in urban Canadian centres each year (fact check). Nonetheless, the information homeless women in the literature is specifically limited. Generally, current evidence does depict that the particular needs of women are not being fully met in homeless shelters, program, organizations etc.

This project offers a literature review of female homelessness in North America. It will focus on four specific aspects: (1) Mental Health and Trauma, (2) Availability of Housing, (3) Incarceration and Drug Abuse and (4) The Aboriginal community. The project was conducted during the 2016-17 academic year and involved 10 journal articles, written between the years 2000 and 2017, which were reviewed for each of the sub-sections mentioned above, using Google Scholar and Medline etc. The objective of this project is to raise awareness on the needs and causes of women facing homelessness and discuss a few suggestions to overcome these adversities

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Machine Learning for Identifying Genes Responsible for Alzheimer's Disease**

**Presenter: West, Peter**

Differentiation between diseases sharing similar symptoms as well as subtypes of the same disease is a current and significant challenge. Computational genetics has potential to be useful here by offering a better understanding of genes and genetic variables involved in disease, but it has seen mixed success so far. Historically popular methods investigate only the genome, one base pair at a time, and infer gene significance from significance of nearby genetic variables. This method is quite successful for pathologies with genetically simple causes but fails to extend well to more complex diseases, such as Alzheimer's Disease (AD), the illness studied here. We investigate the potential for combining machine learning techniques with recently available multi-omic data (i.e. gene-related data beyond base pair sequence) to improve knowledge and methods related to this problem. The method, modularity-informed multiscale multiview group inference (or M3GI) is new to our work. M3GI makes use of multiview clustering (a machine learning method) to form groupings of patients based on the data at each gene. If the grouping for a gene is similar to the incidence of AD within patients, then the given gene is likely important to the disease. Our results are relevant to machine learning and the study of AD. M3GI outperformed a number of other competitive machine learning schemes on synthetic data, and applying M3GI to real multiomic AD data, we identified a number of genes likely related to the AD pathology.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Effects of rTMS treatment on Sleep Patterns in Patients with Depression**

**Presenter: Wigisser, Joane**

Major depressive disorder (MDD) is a syndrome that affects the patient's life severely, including symptoms such as mood disturbances, cognitive and physical impairments. Patients suffering from depression tend to show reduced daily activity and sleep problems. Repetitive transcranial magnetic stimulation (rTMS) is a form of non-invasive brain stimulation therapy. This method is used to treat depression by stimulating the brain using pulsating magnetic fields. However, the effects of repetitive transcranial magnetic stimulation (rTMS) on physical activity and sleep patterns in patients suffering from MDD are still unclear. Therefore, this study investigated changes in sleep patterns and motor activity in MDD before and after rTMS treatment. Rest and activity cycles were measured with a non-invasive method called actigraphy which was worn on the wrist of the participants. My hypothesis was that sleep and activity measures would improve with rTMS treatment and this would be negatively correlated to depressive symptoms. The sample consisted of 40 participants diagnosed with depression who wore actigraphy for approximately 7 days before or shortly after starting rTMS and approximately 7 days after completing a course of rTMS. Preliminary results do not show a significant change in sleep patterns before and after rTMS treatment. However, results comparing patients that responded to treatment to participants that did not respond are still yet to be analyzed. Further understanding the effects of TMS treatment on sleep and activity patterns in patients with depression will help inform clinical practice and lead to development of improved treatments for MDD.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Role of the Interleukin-7 Family of Cytokines in Influenza Infection**

**Presenter: Yau, Clement**

The influenza A virus is an annual cause of global morbidity and mortality, with the elderly and young population being at an increased risk of severe disease. Interleukin-7 (IL-7) has an essential role in the development of an immune response towards an influenza infection. Although first identified as a cytokine vital for development and homeostatic regulation of T-cells, it has since been demonstrated to improve T-cell response towards chronic virus infections. On the other hand, thymic stromal lymphopoietin (TSLP), another member of the IL-7 cytokine family, has been suggested to play a role in defense against viral infections via promotion of anti-viral CD8 T-cells. However, there is still dispute over TSLP's role during influenza infection. In this project, the aim is to evaluate the role of the IL-7 family of cytokines during influenza infection. As TSLP expression has been previously observed to be increased in mice with intestinal epithelial breaches, it is hypothesized that the IL-7 family of cytokines may have a barrier integrity alarm role in an influenza infection. This study measures the levels of IL-7 and TSLP expressed in A549 Type II alveolar epithelial cells after infection with PR8 H1N1 influenza virus. Gene expression is evaluated via qRT-PCR of the RNA isolated from the A549 cells at various time points after initial influenza infection. Preliminary findings have revealed a spike in IL-7 expression levels 24 hours after infection. Subsequent studies to confirm these findings and obtain data on TSLP levels are currently in progress.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Caffeine & Alzheimer's Disease: A novel avenue for treatment delivery**

**Presenter: Young, Stacey**

Brain and behavior can be affected by the intake of coffee and related substances with resultant physiological changes. Alzheimer's Disease (AD) consists of physiological abnormalities that include rapid brain peptide (short protein) plaque formation known as amyloid- $\beta$ , decreased glucose metabolism, and increased pro-inflammatory signaling protein release (known as cytokines proteins that are vital to neuronal communication), which ultimately result in damage and degeneration of the brain through cellular loss. Thus, we assessed whether caffeine intake could be a useful intervention for AD patients by examining these three pathophysiological factors: amyloid protein synthesis, glucose metabolism, and immune response. We performed a selective literature review of both human and animal models studies exploring empirical changes in the biological pathways in AD with caffeine. The analysis of literature indicates potential benefits from slowing down to possible reversal of AD physiological markers. The oral administration of caffeine appears to counteract cellular loss and brain degeneration by inhibiting toxic amyloid- $\beta$  protein cleavage and plaque formation, enhancing glucose usage, and promoting immune response without increasing pro-inflammatory signals. The examination of evidence thus far suggest that caffeine may have potential benefits by minimizing or reversing the progression of AD, although further studies are required to determine optimal dosage and frequency.

# Thursday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Liposomes as a Platform Drug Delivery System**

**Presenter: Zhang, Jessie**

Liposomes can be broadly defined as spherical vesicles with at least one lipid bilayer that encloses an aqueous core. They can encapsulate both hydrophobic and hydrophilic drugs, and they serve as powerful vehicles for drug delivery. Liposomes can be manufactured with both the top-down approach, involving the synthesis of a lipid membrane before passing it through filters to reduce the liposome size, and the bottom-up approach, involving the direct assembly of nanoparticles by injecting different components together. Some examples of the methods used in liposome synthesis include thin-film hydration, reversed phase evaporation, solvent-injection or NanoAssemblr. Different manufacture techniques, lipid compositions and drug loading mechanisms result in liposomes with different characteristics and biodistribution, which allow liposomes to be synthesized for specific purposes. Because of their versatility and reduction of unwanted effects of administer drugs, liposomes have been used in various medical applications, such as tumor treatment, vaccine delivery and gene therapy.

# Friday Oral Presentation List

## 5:00 pm - 6:30 pm

### Henry Angus 234

#### **Controversies over the Trans Mountain Pipeline Expansion Project: Assessing the Prominence of Stakeholder Perspectives through Newspaper Analyses**

Daggett, Janessa

#### **Modern Advances in Diabetes Care: A Tale of 3 Projects**

Jessa, Rehan

#### **Web ValueCharts: Supporting Decision Makers with Interactive, Web-Based Visualizations**

Mishkin, Aaron

#### **Dairy Industry Stakeholder Perceptions of British Columbia's Emergency Slaughter Program**

Roberts, Caitlin

#### **Characterization of the Endoplasmic Reticulum using Super-Resolution Microscopy**

Zhu, Jiajia

### Henry Angus 235

#### **Improving Blood Collection for Better circulating-tumour DNA Research**

Cheng, Brian

#### **Eliminating the Penny in Canada: An Economic Analysis of Penny-rounding on Grocery Items**

Cheung, Christina

#### **The Effects of Seasonal Changes on Photosynthesis, Transpiration and Protein Levels in Red Maple, Red Oak and Western Red Cedar**

Dhillon, Amy

#### **Playability: Perspectives on Children's Outdoor Play**

Dhillon, Jaspreet

#### **Effect of increasing cost of access to a resource on the behaviour of dairy cows**

Wong, Janice

# Friday Oral Presentation List

## 5:00 pm - 6:30 pm

### Henry Angus 237

**Discrimination in Canada's Labour Markets: Evidence From Elite Professional Service Firms in Toronto**

Chawla, Daniel

**Applications of Mechanized Proofs involving the Symmetric Group and Convex Functions**

Kwan, Carl

**Independent predictors of progression to empyema**

MousaDoust, Dorsa

**Perception of balance is modified through adaptation to induced sensorimotor delays**

Ortiz Angulo, Oscar

### Henry Angus 243

**Discover of a Novel Biologic with Broad-spectrum Antiviral Activities Against Zikvia and Dengue Viruses**

Aicher, Sophie

**Assessing dairy cow motivation for access to a mechanical brush**

McConnachie, Emilie

**Time to get moving? A systematic review of forest management adaptation initiatives in light of climate change**

Pelai, Ricardo

**Homelessness in Vancouver: Analysis of organizations' approaches and attitudes**

Randhawa, Abnashi & Gohari, Amir

# Friday Oral Presentation List

**5:00 pm - 6:30 pm**

Henry Angus 334

**The Role of Sex Peptide on Female *Drosophila* Survival under Starvation**

Chih, Tiffany

**East - West Attitudinal Similarities and Differences in Sexuality: The Role of Implicit Cognition**

Lau, Parky

**Genetic Alterations of the  $G\alpha 13$  Signaling Pathway in Primary Mediastinal Large B-Cell Lymphoma**

Lee, Marissa

**Machine Learning: Ensemble Method Parallelization**

Loss, Brandon & Gavrilov, Andrei

**Transparent & Stretchable Tactile Interface**

Wyss, Justin

Henry Angus 345

**Correlation between ASIA classification, proprioception and vibration sense in patients with incomplete spinal cord injury**

Jacob, Sanya

**How do neurosteroids control the "birth" of new neurons in the adult brain?**

King, Justin

**Application of bacteriophages for reduction of verotoxigenic *Escherichia coli* on bean sprout seeds**

Liu, Lydia; Lam, Pearl; Zhao, Mitchie & Li, Sharon

**Image Transitions: Visual Search In a Dynamic World**

Pertels, Yana; Thongprasert, Sarah; Ip, Jessica & Chai, Wendy

**Who Wants to Find a Lover Online ? - A Study of the Determinants of Online Dating Usage and Its Correlation with the Quality and Long-term Stability of Relationships**

Song, Sibyl

# Friday Oral Presentation List

**5:00 pm - 6:30 pm**

Henry Angus 354

**Exploring Spliceosomal Diversity in Microsporidia, a clade of Reduced Intracellular Parasites**

Long, Rory

**Numerical and Experimental Investigation of a Ytterbium Fibre Pre-Amplifier**

Nantel, Megan

**Analysis of the Combined Effects of Maternal Stress and Synthetic Glucocorticoid Administration on Fetal Brain Development**

Ovenden, Grace; Wroot, Hayley & Brinkerhoff, Saskia

**Low frequency visual stimuli do not evoke rhythmic neural activity in a model for a developing neural circuit**

Safa, Sina & Wong, Jodi

**Cognitive Neuroplasticity for Children with Learning Difficulties**

Wong, Natalie

# Friday Oral Presentation Abstracts

Henry Angus 234, 5:00 PM - 6:30 PM

**Title: Controversies over the Trans Mountain Pipeline Expansion Project: Assessing the Prominence of Stakeholder Perspectives through Newspaper Analyses**

**Presenter: Daggett, Janessa**

The use of fossil fuels, particularly of petroleum (i.e. crude oil), is highly demanded within the global energy sector. In a global economy, pipelines are crucial for mobilizing petroleum resources and securing domestic and international trade relations. Extraction and transport of petroleum from Canadian oil sands have strengthened the national economy by both providing jobs and increasing trade networks (Doucet & DesLibris, 2012; Ministry of Environment, 2012). However, extraction is riddled with controversy and contestation. Both extraction and transportation of petroleum often occur on Indigenous lands and territories, some of which is unceded. In addition, environmental risks, including terrestrial or marine oil spills, and landscape restructuring concerns due to construction, are topics discussed in the pipeline debate.

Since social media, government reports and newspaper articles often vary in their political perspectives surrounding pipeline development, it is important to assess the prominence of certain perspectives and types of knowledge that exist in the public realm. It is equally important to understand whether certain perspectives are overshadowed, and the reasons behind this.

This presentation accomplishes this goal using the case study of the Trans Mountain Pipeline. Additionally, it will explore these potential newspaper publication biases that may be attributed to invested parties perspectives. A literature review on pipeline policies will be followed by collecting data from public newspaper articles. Results and data interpretation will provide insight into methods used by stakeholders' to potentially affect public perception of pipeline planning.

# Friday Oral Presentation Abstracts

Henry Angus 234, 5:00 PM - 6:30 PM

**Title: Modern Advances in Diabetes Care: A Tale of 3 Projects**

**Presenter: Jessa, Rehan**

A demographic shift towards high fat diets and low physical activity has caused a rapid rise in Type 2 diabetes incidence on both a national and global scale. The Canadian Diabetes Association reports that diabetes prevalence in Canada has increased by 72% since 2006. Unfortunately, this chronic disease disproportionately affects diverse ethnic groups. Among these groups are South Asians, who are at high risk for developing Type 2 diabetes over the lifecourse. With the expansive development of innovative technology, diabetes care can be culturally tailored and improve self-management behaviors. This presentation outlines three initiatives developed by Dr. Tricia S. Tang of the UBC Department of Medicine: PLEASED (Peer Lead Empowerment-Based Approach to Self-Management Efforts in Diabetes), C2C (Clinic 2 Community) and SPACE (Supporting Physical Activity, a Community Effort). Each project focuses on diabetes prevention and management, and all have the potential to connect Type 2 diabetes patients with experienced diabetes educators and specialists. Each study is currently at the halfway mark and results indicate that technology can be effective in connecting those affected by diabetes with the tools they need to improve their diabetes related health outcomes and overall well-being.

# Friday Oral Presentation Abstracts

Henry Angus 234, 5:00 PM - 6:30 PM

**Title: Web ValueCharts: Supporting Decision Makers with Interactive, Web-Based Visualizations**

**Presenter: Mishkin, Aaron**

Complex decisions involving multiple criteria and alternatives are challenging problems for individuals and groups of people. Finding satisfactory solutions often requires evaluating tradeoffs due to conflicts between criteria, a task at which people are not effective. For example, minimizing or maximizing a single criterion is a common approach when solving these problems and leads to the selection of alternatives which perform poorly over most criteria. The field of Decision Theory provides an effective framework for analyzing tradeoffs in multi-criteria problems, but has not been effectively realized in software systems that can address generic decisions. Web ValueCharts is a prototype web-application that provides a set of visualizations and interactions designed to support individuals and groups making complex decisions. The system enables individuals to define, save, and share custom decision problems, and guides them through the creation of decision theoretic models that represent their preferences. A set of core visualizations and interactions called a ValueChart allow individuals to view and manipulate their models. This ValueChart empowers users to directly investigate tradeoffs between criteria. The Group ValueChart, an extension of a ValueChart, facilitates comparing multiple individuals' preferences simultaneously for group decision making. While past studies conducted on artificial and real decision problems have established that ValueCharts and Group ValueCharts are effective tools, Web ValueCharts has not yet been tested due to its early development stage. Future studies are anticipated to both refine Web ValueCharts and to demonstrate its utility as a software system for supporting complex decision problems.

# Friday Oral Presentation Abstracts

Henry Angus 234, 5:00 PM - 6:30 PM

**Title: Dairy Industry Stakeholder Perceptions of British Columbia's Emergency Slaughter Program**

**Presenter: Roberts, Caitlin**

Emergency slaughter is the on-farm slaughter of an injured animal. This occurs when an animal is not fit for live transport but is still fit for human consumption. Use of the Emergency Slaughter Program (ESP) in British Columbia emerged in 2014 and is primarily used by dairy producers. The aim of this study was to examine how dairy industry professionals perceive the ESP in British Columbia. Twenty-five semi-structured interviews and 3 focus groups were conducted with dairy industry professionals. Interviews were then open-coded and analyzed for major themes using thematic analysis. Preliminary results revealed a broad spectrum of views on the ESP, with participants diverging in whether they supported use of the program. Two emerging themes include 1) reducing waste and 2) concern for the cow. First, some participants perceived the ESP as an opportunity to minimize waste and add meat to the food supply. Second, participants expressed concern for their cows, and hoped to minimize any undue suffering. Despite this shared concern for cows, it was observed that participants drew different conclusions from their convictions, with some believing that emergency slaughter improved animal welfare, and others stating that emergency slaughter negatively impacted it. These results indicate that although opinions of the ESP vary widely, there are some dimensions where dairy industry stakeholders align in their thinking. These points of agreement should serve as a basis upon which to build dairy industry programs and policies that are acceptable to all industry stakeholders.

# Friday Oral Presentation Abstracts

Henry Angus 234, 5:00 PM - 6:30 PM

**Title: Characterization of the Endoplasmic Reticulum using Super-Resolution Microscopy**

**Presenter: Zhu, Jiajia**

The Endoplasmic Reticulum (ER) is a dynamic, membrane-bound organelle that is found within all cells of living organisms. The ER spans the entirety of cell from the nuclear envelope to the cell periphery. The ER plays an essential role in the health of cells by functioning in: storage of  $\text{Ca}^{2+}$ , protein synthesis and the unfolded protein response. Stress of the ER is implicated in diabetes, inflammation and neurodegenerative disorders. Characterization of the structure and function of the ER will progress the understanding of the sub-cellular nature of these diseases. Previously, the ER has been shown to consist of a tubular matrix in the cell periphery and sheet-like structures in the center. Traditional confocal microscopy has been limited in its spatiotemporal resolution of ER tubules, which have a mean width of 100 nm. Stimulated emission depletion (STED) super resolution microscopy enhances the achievable resolution of images through inhibition of select fluorophores. We have used (STED) super resolution microscopy to visualize the complex structure of ER tubules and identify where key proteins localize on the ER structure. Preliminary data for this work has identified the presence of “dips” in ER tubules associated with complexes of multiple structural and functional ER proteins. Characterization of these ER complexes will lead to further understanding of the function of the ER in cells in healthy and disease states.

# Friday Oral Presentation Abstracts

Henry Angus 235, 5:00 PM - 6:30 PM

**Title: Improving Blood Collection for Better circulating-tumour DNA Research**

**Presenter: Cheng, Brian**

Circulating tumor DNA (ctDNA) has been gaining traction as an alternative to invasive tissue biopsies in cancer diagnostics, and can be a viable biomarker in monitoring residual tumor burden or disease progression. However, the difficulty of processing patient blood samples to extract ctDNA has been the major challenge in utilizing ctDNA in clinical practice. Currently, there is a need for immediate blood processing to prevent patient white blood cells from contaminating the low levels of ctDNA with non-tumor genomic DNA. This limitation has prevented researchers from performing large population-based studies on ctDNA, since sample collection sites are restricted to major hospitals that possess the proper equipment. The good news is recent products such as Streck cell-free blood collection tubes have been shown to prevent genomic DNA contamination up to 14 days; which could solve one of the problems associated with ctDNA collection. By measuring the concentrations of ctDNA and genomic DNA derived from patient plasmas multiple days after blood draw; this project intends to evaluate the full extent of Streck tube's ability to prevent genomic DNA contamination and ctDNA degradation. Initial extractions of 7 different patient's cfDNA were performed 2 hours, 7 days, and 10 days after blood collection. Patient-matched tumors were then sequenced using DNA sequencing, and a discovery set of 7 patient-specific breast cancer mutations were found. Next steps of this project will employ these mutations as targets for subsequent ctDNA detection, utilizing the highly sensitive digital droplet PCR as the platform of analysis.

# Friday Oral Presentation Abstracts

Henry Angus 235, 5:00 PM - 6:30 PM

**Title: Eliminating the Penny in Canada: An Economic Analysis of Penny-rounding on Grocery Items**

**Presenter: Cheung, Christina**

In 2013, Royal Canadian Mint (RCM) ceased the distribution of pennies, which has led firms in Canada to round cash transactions to the nearest five-cent. Theoretically, the net effect of rounding will be zero, given that the final digit of prices has equal distribution from "0" to "9". However, prices in the grocery stores are unevenly distributed as the majority end in "8" or "9". For instance, in the United States approximately 82.5% of goods in a representative convenience store (Lombra 2001), and 60.8% of the grocery prices collected for this research, end in "9". This suggests that attaining an average of zero net effect may after all be unlikely, which gives rise to the possibility that, when the penny is rounded to the nearest nickel, the system financially benefits either consumers or firms at the expense of the opposite party.

The purpose of this presentation is to examine the economic consequences of penny-rounding on grocery items in Canada, specifically whether the current rounding system places monetary burden on either firms or consumers. For this study, 18,095 prices have been collected from three representative grocery chain-stores. The purchase combinations will then be simulated on Python to study how penny-rounding varies with respect to two factors: item quantities and provincial consumer tax rates. Combinations of 1 to 10 items with nine tax rates will be simulated, for a total of 100 combinations. For each combination, 10,000 random simulations will be run to assess the accumulative economic effects of penny-rounding.

# Friday Oral Presentation Abstracts

Henry Angus 235, 5:00 PM - 6:30 PM

**Title: The Effects of Seasonal Changes on Photosynthesis, Transpiration and Protein Levels in Red Maple, Red Oak and Western Red Cedar**

**Presenter: Dhillon, Amy**

The ability of plants to capture carbon dioxide looks to be a promising solution to the increasing levels of greenhouse gases in the atmosphere. Photosynthesis is the process by which carbon dioxide is converted into sugars by the leaves in the presence of sunlight. However, there is conflicting evidence in regards to the effectiveness of plants. Some literature states that deciduous species like the Maple and Oak generally outperform evergreen species like the Cedar but a few specific evergreen species are known to have higher rates than their deciduous counterparts. This study aimed to compare chlorophyll, protein, photosynthesis and transpiration levels in Maple, Oak and Cedar trees and to provide insight into which trees may be the most efficient at sequestering carbon dioxide. The CI-340 Handheld Photosynthesis machine was used to measure leaf photosynthesis and transpiration rates. The results of this study indicate that the Cedar is more efficient at sequestering carbon dioxide than the Maple and the Oak. Because it maintains its leaves instead of annually shedding them, carbon fixation in cedar leaves occurs throughout the entire year. It is important to note that environmental conditions, like water stress and high irradiances, may have affected the Maple and Oak's potentially high ability to assimilate carbon. In summary, the Western Red Cedar can capture relatively high amounts of carbon dioxide from the atmosphere and thus, should be considered to help combat the rising carbon dioxide levels.

# Friday Oral Presentation Abstracts

Henry Angus 235, 5:00 PM - 6:30 PM

**Title: Playability: Perspectives on Children's Outdoor Play**

**Presenter: Dhillon, Jaspreet**

As children, some of our favourite childhood memories might come from exploring the outdoors such as climbing trees or riding our bikes. Playing outdoors is critical for children's emotional, physical, social, and mental development and well-being. While one might be aware of the benefits of playing outdoors as children, the fact remains that playing outdoors over the years is diminishing. Our research seeks to gain the perspective of children aged 10-13 years and their parents, targeting specific communities in Vancouver, on why they are motivated - or not - to play outside. In this mixed-methods study, we utilize GPS monitors, accelerometers, surveys, and qualitative interview data to better understand children's and parents' perception of their built-environment in regards children's physical activity and independent mobility. This is to develop an index of the playability of outdoor environments - the extent to which a given environment is friendly for outdoor play for children. An environment with high playability is easily and safely accessible and contains stimulating play opportunities. We hope to understand that various factors that affect outdoor play, such as gender, children's versus parent's perspective on playing outside, and built environments, in an effort to establish a playability index that is useful for designing urban environments.

# Friday Oral Presentation Abstracts

Henry Angus 235, 5:00 PM - 6:30 PM

**Title: Effect of increasing cost of access to a resource on the behaviour of dairy cows**

**Presenter: Wong, Janice**

Motivation testing can assess how important different resources are for an animal by gradually increasing the amount of work the animals have to perform to access a resource. However, increasing the workload to access a resource can lead to behavioral changes thought to be a consequence of the animal minimizing the cost they pay over time while still maintaining the benefits associated with accessing the resource. The mechanical brush is a resource that can be used by intensively housed dairy cattle to facilitate expression of their natural grooming behaviors. The aim of the current study was to determine if cattle altered their strategy to access a mechanical brush as the cost of accessing the brush increased. Ten cows were trained to open a gate that restricted access to an alley containing a mechanical brush. Weight was gradually added to the gate over time. Using continuous video observations, we tracked the number of daily visits to the alley and the time spent interacting with the brush at each visit. As the cost to access the brush increased, the frequency of alley visits decreased and the length of time interacting with the brush increased. This work provides evidence that cows are able to alter their strategy such that they maintain the benefits associated with accessing the resource despite the increased cost required to access the resource. These results are important to acknowledge in future motivation studies where the animal's behaviour is interpreted to be indicative of resource importance.

# Friday Oral Presentation Abstracts

Henry Angus 237, 5:00 PM - 6:30 PM

**Title: Discrimination in Canada's Labour Markets: Evidence From Elite Professional Service Firms in Toronto**

**Presenter: Chawla, Daniel**

As racial diversity has steadily increased within Canada, the extent of Canadian egalitarianism has captured much attention. Previous scholarly literature has demonstrated that professionals of visible minorities experience discrimination in Canada's labour markets. Meanwhile, elite professional firms claim to have programs that attempt to address racial discrimination. This study tested these claims by investigating the representation of professionals of visible minority in five investment-banking firms, four law firms, and three management consulting firms with offices in Toronto. It used company websites and LinkedIn Premium—a social networking platform utilized by most employees at these firms—to collect data on 1,985 employees across three core roles: those of entry-level associates, mid-level managers, and senior managers. These employees were then classified based on their visible minority status. A quantitative analysis of the data indicates that, in Toronto, investment banking firms and management consulting firms have fair recruiting practices at the associate level but law firms suffer from a disproportionately small percentage of professionals of visible minorities. Additionally, in each of the 12 firms, there was a significant reduction in the proportion of professionals of visible minorities as seniority levels increased. This reduction suggests evidence of a pronounced glass ceiling that inhibits upward career mobility for professionals of visible minorities. Overall, this study highlights a need to improve workplace diversity and equity policy within elite professional service firms.

# Friday Oral Presentation Abstracts

Henry Angus 237, 5:00 PM - 6:30 PM

**Title: Applications of Mechanized Proofs involving the Symmetric Group and Convex Functions**

**Presenter: Kwan, Carl**

As societal dependencies on computer and cyber-physical systems become increasingly common, reliable software and hardware become similarly invaluable. Industries, such as the aerospace or medical industries, dealing with vital and critical components require a more rigorous vetting process for their tools than those typically found in quality testing. Assisted theorem proving is the area of mathematical logic that uses computer programs to prove mathematical statements (or theorems); these statements include properties about computer and cyber-physical systems which makes theorem proving an integral component of their verification. While the area of pure mathematics has been well developed, there are relatively few theorems for which a computer-verified proof exists. The symmetric group, a mathematical structure which deals with permutations (the act of rearranging a collection of objects), is a prime example. Theorems involving the symmetric group are not readily usable by certain computer theorem provers. One of our previous projects provides computer-verified proofs of these theorems and yielded a mechanism for proving the correctness of certain circuits. Our ongoing research deals with formally proving theorems involving convex functions. These functions help us reason about the performance and correctness of computer systems and the algorithms that control them. A key application of our current research is in machine learning, an area known for making automatic and accurate decisions based on data. Prevalent in this area are systems of inequalities involving convex functions. Being able to automatically reason over these systems can lead to the automatic verification of faster prediction algorithms.

# Friday Oral Presentation Abstracts

Henry Angus 237, 5:00 PM - 6:30 PM

**Title: Independent predictors of progression to empyema**

**Presenter: MousaDoust, Dorsa**

*Background:* Parapneumonic Empyema, or bacterial infection of the pleural space, is most commonly caused by untreated pneumonia or post-surgical intervention. *Objective:* The aim of this study is to quantify the incidence rate of empyema and identify its risk factors.

*Methods:* A retrospective record review of patients, age 18years and older, treated at VGH for hospital or community acquired pneumonia between November 1st, 2014 and October 31st, 2015 was conducted. Univariable and multivariable analysis of risk factors associated with development of empyema were performed.

*Results:* The incidence rate of empyema was 10.76% (n=1766). There is strong evidence that those who developed empyema had increased mean length of hospital stay (37.66 days vs 20.72 days;  $p < 0.0001$ ). Multivariable analysis identified (odds ratio; 95% Confidence Interval, p-value): Age $\leq$ 61 ( $p < 0.0001$ ), Chronic Obstructive Pulmonary Disease (COPD) (1.4; 1.01-2.0,  $p = 0.04$ ) and particularly Peripheral Vascular Disease (PVD) (1.9; 1.3-2.8,  $p = 0.02$ ) as strong predictors of empyema. Additionally, there is very strong evidence that development of empyema was associated with a higher mean ( $p = 0.0004$ ) and categorical Charlson Comorbidity Index (CCI) score. *Conclusions:* The reported incidence rate of empyema among pneumonia patients, 10.76%, is approximately twice the reported literature value. Age, PVD, COPD, increased length of hospital stay and high CCI score increase the risk of empyema development. Stratification of patients based on the above risk factors may lead to early recognition of empyema, predict the causative pathogens and lower the mortality rate.

# Friday Oral Presentation Abstracts

Henry Angus 237, 5:00 PM - 6:30 PM

**Title: Perception of balance is modified through adaptation to induced sensorimotor delays**

**Presenter: Ortiz Angulo, Oscar**

For human standing balance, the central nervous system is believed to implement a sensorimotor integration that predicts sensory inputs and compares them with those that actually arise from self-generated actions. This allows the brain to establish a perceptual awareness for the state of balance control – identifying whether body motion is self-generated or externally-influenced. Here, we examined the sensitivity and adaptability of this process by artificially altering the delays between balance motor commands and sensory feedback. Using a robotic balance simulator, we introduced at random a range of predetermined delays (20 ms – 350 ms) between ankle-produced torques and consequent body movement. Through a psychophysical design, human participants were tasked to report when they perceived a change in balance control. Subsequently, participants performed a week-long adaptation protocol, in which they attempted to maintain standing balance with an induced delay of 400 ms. Afterwards, perceptual sensitivity was retested. Participants improved their balance performance at a 400 ms delay over the course of the weeklong adaptation by reducing their sway variability and number of virtual falls. After the adaptation period, participants also required larger delays to detect balance changes. Our results indicate that sensorimotor errors (delays) alert the conscious brain of the origin of balance-related movements (self- vs externally-influenced). However, balance responses can be re-calibrated through adaptation to induced delays. We suggest that the perceptual sensitivity of balance does not change, but adaptations can reduce the error during sensorimotor integration therefore requiring a greater delay to consciously detect errors.

# Friday Oral Presentation Abstracts

Henry Angus 243, 5:00 PM - 6:30 PM

**Title: Discovery of a Novel Biologic with Broad-spectrum Antiviral Activities Against Zika and Dengue Viruses**

**Presenter: Aicher, Sophie**

Zika virus (ZIKV) is an emerging human virus first identified in 1947. Following its introduction into Brazil in 2013, the virus has rapidly spread in at least 26 countries in the Americas. ZIKV is now the second most widely distributed mosquito-borne virus (arbovirus) in the Americas, after the closely related Dengue virus (DENV). In April 2016, the World Health Organization declared the ZIKV outbreak a public health emergency of international concern and acknowledged the causal relationship between ZIKV infection and severe brain anomalies (ZIKV congenital syndrome). At present, no specific treatment has been identified for these two arboviral infections. Given that co-infection of ZIKV and DENV has been recently described and the severity of arbovirus-associated diseases, novel therapeutic drugs for ZIKV and DENV infection are urgently needed. Here, we report the discovery of a novel antiviral biologic that robustly blocks Zika and Dengue virus infections in cultured human cells. The biologic is a naturally occurring protein-based inhibitor targeting human enzymes belonging to the proprotein convertase (PC) family. We employed flow cytometry and confocal microscopy techniques to show a robust decrease in host-cell susceptibility to DENV and ZIKV infections in the biologic-treated cells. Using plaque assay techniques for arboviruses, we confirmed that our biologic blocks the production of infectious virus particles in cultured human cells. The results of our studies uncover the critical role of cellular PC in ZIKV and DENV lifecycles and identify novel broad-spectrum antiviral targets for two arboviruses representing a significant threat to global health.

# Friday Oral Presentation Abstracts

Henry Angus 243, 5:00 PM - 6:30 PM

**Title: Assessing dairy cow motivation for access to a mechanical brush**

**Presenter: McConnachie, Emilie**

The automated mechanical brush is a resource that can be installed in dairy cattle housing to facilitate the expression of natural grooming behaviors. However, little is known about how highly cows value this resource. The aim of this research was to determine how motivated dairy cows are to access a mechanical brush, argued by some to be a luxury resource, compared with feed, a necessary resource. Motivation testing determines how important resources are for animals by making animals work to access the resource; the harder an animal works for a resource, presumably the more important it is. To test this objective, 10 Holstein cows were trained to push open a weighted-gate that restricted access to 1) a mechanical brush 2) feed (positive control) and 3) empty space (negative control). The gate's weight was increased over time so that animals had to increasingly pay a higher price to access the treatment's resource. The maximum weight the cows were willing to push to access each resource was determined and analyzed. Cows are highly motivated to access fresh feed, so we predicted that they would push the greatest amount of weight for feed. However, survival analysis failed to detect a difference in motivation for access to feed or the mechanical brush, providing strong evidence that cows are highly motivated to access a grooming device. Dairy farmers that house cows indoors should be encouraged to incorporate mechanical brushes into their dairy facilities as a way to improve cattle welfare.

# Friday Oral Presentation Abstracts

Henry Angus 243, 5:00 PM - 6:30 PM

**Title: Time to get moving? A systematic review of forest management adaptation initiatives in light of climate change**

**Presenter: Pelai, Ricardo**

Climate change presents a novel and serious challenge to forest managers worldwide as many tree populations are expected to become maladapted to their local growing environments. A number of strategies to adapt forest management practices to the anticipated impacts of climate change have been proposed, ranging from traditional tree breeding to more controversial actions such as genetic engineering. While the implications of some of these initiatives have been explored in-depth, the extent to which they are taking place globally and in relation to one another thus far remains empirically under-examined. We examined the recommended types of forest management adaptation initiatives by conducting a systematic review and content analysis of peer-reviewed scientific articles published between 1997 and 2016. We developed and applied a typology to explore the recommendations that are being proposed, including their specificity, geographic focus, forest type, and basis of recommendations. Seven different recommendation classes were identified, and the majority were associated with management tactics (38.9%), followed by increased capacity related to scientific knowledge and uncertainty (26.9%). The vast majority of the publications (85.6%) had either US/Canada or Europe as their geographic focus. Many publications did not specify the type of forest they were focusing on (35.5%), but the highest percentage among those who did concentrated on evergreen coniferous forests (29%). This study deepens our understanding of the range of options and priorities put forward for forest management adaptation, and identifies future research activities, challenges and opportunities related to advancing forest adaptation under climate change.

# Friday Oral Presentation Abstracts

Henry Angus 243, 5:00 PM - 6:30 PM

**Title: Homelessness in Vancouver: Analysis of organizations' approaches and attitudes**

**Presenters: Randhawa, Abnashi & Gohari, Amir**

Data from the City of Vancouver suggests that the prevalence of homelessness in Vancouver has been on an increasing trend since 2005. Although there have been numerous studies on the provision of services to the homeless community, not much attention has been dedicated to evaluating the attitude of the involved organizations towards homelessness. This is a considerable gap in our knowledge, as previous studies have demonstrated that attitudes towards homelessness play an important role in the effectiveness of interventions and policy development. To address this issue, we conducted a qualitative analysis on organizations that actively interact with homeless communities in Vancouver, to identify their perspectives towards homelessness. More specifically, we were interested in learning how these organizations define their roles in relation to the issues faced by Vancouver's homeless community. Based on a previously published study, we created a post-representational map (conceptual diagram) of three different viewpoints: liberal, neo-liberal, and critical. These categories were defined using a set of pre-determined questions and guidelines. We analyzed twelve organizations using their official web pages to qualitatively locate them on our conceptual map. We found that the majority of the organizations populate the liberal and neo-liberal categories (along with the interface of the two), with almost no organization exclusively in the critical category. This may be due to how organization performance is evaluated and how budgets are allocated. Our findings are valuable in that they encourage discussion and provide opportunities for organizations to assess their own assumptions and attitudes.

# Friday Oral Presentation Abstracts

Henry Angus 334, 5:00 PM - 6:30 PM

**Title: The Role of Sex Peptide on Female *Drosophila* Survival under Starvation**

**Presenter: Chih, Tiffany**

Reproduction is a necessary biological process for organisms to produce offspring. Females undergo large physiological and behavioral changes after mating to maximize reproductive capacity. Yet how these mating-induced changes affect responses to biological stimuli remains unclear. In our lab, we use the fruit fly, *Drosophila melanogaster*, as a model to investigate how mating-induced changes in female physiology affect their response to starvation, an environmentally and ecologically relevant stress. Our experiments show that mating significantly enhances female survival after starvation. When I investigated which aspect of mating promotes female survival, I found that females lacking the Sex peptide receptor (SPR) could no longer survive longer than unmated females. The goal of my current project is to identify the tissues and time of development in which Sex peptide acts in females to enhance survival. To do this, I use the GAL4/UAS system to manipulate the expression of sex peptide receptor in specific tissues. So far, I found that Sex peptide does not act in either the brain or the fat body, two important tissues involved in starvation and mating responses. Next, I will test the role of Sex peptide in the ovary and the gut, two further tissues that are important in these processes. By finding the tissue that sex peptides act on to enhance survival, we will be able to dissect the molecular process behind the increased female starvation survival after mating. This will provide important information on how mating-induced changes in physiology affect many aspects of female life history.

# Friday Oral Presentation Abstracts

Henry Angus 334, 5:00 PM - 6:30 PM

**Title: East - West Attitudinal Similarities and Differences in Sexuality: The Role of Implicit Cognition**

**Presenter: Lau, Parky**

While attitudinal differences in sexuality between Eastern and Western cultures have been well-documented, these studies have primarily examined sexual attitudes explicitly. Thus, cross-cultural disparities in implicit sexual attitudes have remained largely unexplored. While explicit attitudes result from conscious deliberation and are measured via self-report, implicit attitudes are automatic and non-deliberative positive and negative feelings toward an object and are often measured through response latency. The present study is the first to adopt a dual approach to studying East - West differences in sexuality by comparing explicit and implicit sexual attitudes. These results will elucidate whether previously established East - West differences in sexual attitudes would emerge when social desirability and other response biases are minimized. As well, this study also examines the differential effects of acculturation on explicit and implicit attitudes in Chinese participants. Finally, this study tests whether implicit sexual attitudes predict sexual functioning and sexual satisfaction above explicit attitudes. In pursuit of these research aims, Chinese and Caucasian participants were recruited through an undergraduate research participation system and Amazon Mechanical Turk. Through examining both explicit and implicit attitudes in tandem, we hope to better understand human sexuality and further elucidate the role of sexual attitudes on sexual satisfaction and functioning. Our results and their implications will be presented at the conference.

# Friday Oral Presentation Abstracts

Henry Angus 334, 5:00 PM - 6:30 PM

## **Title: Genetic Alterations of the G $\alpha$ 13 Signaling Pathway in Primary Mediastinal Large B-Cell Lymphoma**

**Presenter: Lee, Marissa**

Lymphomas are among the most common cancers affecting patients worldwide. Primary mediastinal large B-cell lymphoma (PMBCL) represents 2-4% of all non-Hodgkin lymphomas. Current chemotherapy treatments are not able to eliminate the cancer in many patients; therefore, the development of new therapeutic approaches resulting in better treatment outcomes with minimal side effects are critically needed. The purpose of this research is to describe patterns of GNA13 mutations and analyze the mutational frequencies of associated pathway-genes in PMBCL. We hypothesized that mutations in GNA13 and associated pathway genes play a significant role in the pathogenesis of PMBCL and may also contribute to the clinical behavior of the disease. We used Illumina next-generation sequencing (TruSeq custom amplicon sequencing) and Fluidigm arrays followed by SNV prediction algorithms. Mutations were confirmed by performing Sanger sequencing and western blot was used to assess protein abundance. We observed a high prevalence of mutations in the GNA13 gene (33.3%) in PMBCL, including hotspot and splice site mutations, indicating that the GNA13 gene may act as a tumor suppressor. The mutational frequencies of the G $\alpha$ 13 signaling pathway members are as follows: S1PR2 (2.6%), ARHGEF1 (7.9%), P2RY8 (15.8%), and RHOA (2.6%). These results suggest that this pathway may act as a potential promising target for the treatment of PMBCL. Further experiments will be needed in order to elucidate the consequences of each mutation on protein expression and function. This research aims to contribute to personalized medicine by developing targeted therapies for patients diagnosed with PMBCL.

# Friday Oral Presentation Abstracts

Henry Angus 334, 5:00 PM - 6:30 PM

**Title: Machine Learning: Ensemble Method Parallelization**

**Presenters: Loss, Brandon & Gavrilov, Andrei**

Machine learning is a form of artificial intelligence whereby computers discover patterns from data without explicit modelling. Despite its long history, machine learning has only recently come to the forefront, thanks to the explosion in data collection over the last decade. From spam detection in email to product recommendations on websites to the computer vision of driverless vehicles, the applications of machine learning are varied and pervasive.

The majority of open-source machine learning today is written in R, a statistical language, or in Python, a general-purpose scripting language. However, neither language offers true parallelism, which is a major limitation when attempting machine learning at scale. Fortunately, multi-threading and multi-processing alternatives exist that are closely associated with both languages. For Python, there is Julia, a relatively new language that is natively parallel and intentionally designed to call virtually all Python functions. For R, there is the enhanced distribution MRO (Microsoft R Open), formerly RRO (Revolution R Open), which is multi-threaded and has full compatibility with all the packages, scripts, and applications of R.

Our project is to explore the benefits of parallelism for machine learning applications by examining specific implementations in several languages. Given a common dataset, we will reference or conduct performance testing to determine the effect of multi-threading or multi-processing for a particular method. Our primary focus is on ensemble methods, which are a form of meta-learning where classifiers have other classifiers as their input.

# Friday Oral Presentation Abstracts

Henry Angus 334, 5:00 PM - 6:30 PM

**Title: Transparent & Stretchable Tactile Interface**

**Presenter: Wyss, Justin**

The development of tactile sensing technology has significantly advanced the state of the art of human-computer interaction. Wearable medical and fitness devices, creating robots with skin like sensation, and touch sensitive flexible displays are all exciting applications of such technology. However, most transparent touch sensors that have been developed are based on exotic materials such as silver nanowires, carbon nanotubes, and metal mesh. In this work, we present a technology that extends the operation modes to proximity and touch sensing, while being actively bent and stretched, using widely available and low cost materials. The fabrication process developed is simple and scale-able, attributes that are necessary for commercialization purposes. The working principle is based on the well established mutual capacitive sensing technology, where two electrodes form a sense capacitor and the finger acts as a third electrode. The finger disrupts the electric field coupling the sensor electrodes, which in turn, enables the detection of the finger. The electrodes are made of stretchable and ionically conductive polyacrylamide hydrogel that are encapsulated in a flexible silicone substrate. We have demonstrated a 4 X 4 matrix array (measuring 5 cm X 5 cm) implementation, where the sensor can detect a finger hovering a few centimeters above, a light touch, and a swift movement across the sensor surface (popularly known as a swipe), as well as responding to multi-touch. The sensor can easily be scaled to be as large as tens of meters across and therefore opens up a whole new area of possibilities.

# Friday Oral Presentation Abstracts

Henry Angus 345, 5:00 PM - 6:30 PM

**Title: Correlation between ASIA classification, proprioception and vibration sense in patients with incomplete spinal cord injury**

**Presenter: Jacob, Sanya**

A spinal cord injury (SCI) disrupts communication between the brain and body. The severity of dysfunction depends on the level and completeness of injury. Unlike complete injuries, incomplete SCI has some degree of sensory and motor sparing. The American Spinal Injury Association's (ASIA) international standard is clinically used for classifying the level of SCI by assessing motor and sensory integrity. However, the ASIA scale only examines touch to assume the integrity of other distinct sensations such as proprioception (sensing body position) and vibration. This study aims to assess the validity of the ASIA scale by correlating vibration threshold and proprioceptive scores to ASIA scores in people with incomplete SCI. Vibration threshold will be determined by using a probe to apply various vibration amplitudes at many ASIA skin regions. The threshold will be defined as the lowest detectable vibration amplitude. Proprioceptive levels of the legs are measured by assessing the accuracy by which participants reproduce a memorized position using a robotic exoskeleton. Preliminary results indicate that ASIA scores did not predict the ability to detect vibration threshold. Moreover, proprioception accuracy was found to be within normal ranges. However, participant proprioception was more variable indicating that their scores between trials were less consistent than able body scores. This suggests that the current standard of assessing SCI needs revisions and more parameters to accurately define the impairments associated with SCI. This information can be used to personalize rehabilitation techniques, predict outcomes and gain a deeper understanding about the efficacy of SCI treatment.

# Friday Oral Presentation Abstracts

Henry Angus 345, 5:00 PM - 6:30 PM

**Title: How do neurosteroids control the “birth” of new neurons in the adult brain?**

**Presenter: King, Justin**

Neurogenesis is the process by which new neurons and glial cells are created during growth and repair of the nervous system. In most vertebrates, neurogenesis occurs primarily during embryonic development. In mammals, neurogenesis in the adult brain is restricted to two specific brain regions: the subgranular zone of the dentate gyrus of the hippocampus and the subventricular zone of the lateral ventricles. Therefore, the overall rate of adult neurogenesis, relative to the number of cells in the whole brain, is very low. In contrast, the relative numbers of new cells generated in the teleost fish brain is at least one order of magnitude larger than in mammals, making the teleost a useful model organism for studying neurogenesis. There are growth factors and molecules that have been shown to modulate neurogenesis, one of which is a neuroactive steroid called allopregnanolone. Allopregnanolone is a derivative of the hormone progesterone, and is believed to enhance neurogenesis, based on studies done in mammals. However, this neurogenic effect has not yet been demonstrated in teleost fish. In order to shed light on how allopregnanolone controls the development of new neurons in a teleost, fluorescence microscopy was used to quantify cell division in goldfish cerebellum following intraperitoneal injection of different doses and durations of allopregnanolone. Our results showed that this neurosteroid had no effect on neurogenesis after 24 hours of treatment, but at 8 hours following a dose of 1.5 mg/kg, allopregnanolone increased cerebellar cell division by approximately 160%. At 24 hours after the injection, neurogenesis had returned to control levels. These data support the hypothesis that allopregnanolone increases neurogenesis in the fish brain, similar to rodents, and indicate the applicability of teleost studies to measure the functions of neurosteroids such as allopregnanolone. Taken together, our results indicate a possible pharmacological way to stimulate neurogenesis in neurodegenerative diseases, such as Alzheimer's Disease, and during recovery from traumatic brain injury.

# Friday Oral Presentation Abstracts

Henry Angus 345, 5:00 PM - 6:30 PM

**Title: Application of bacteriophages for reduction of verotoxigenic Escherichia coli on bean sprout seeds**

**Presenters: Liu, Lydia; Lam, Pearl; Zhao, Mitchie & Li, Sharon**

Verotoxigenic Escherichia coli (VTEC) is associated with sprouts-related foodborne illnesses and complete eradication of this pathogen remains a struggle in the food industry. Usage of chlorine to sanitize produce has limitations due to a decreased efficacy with increased soil. The use of bacteriophages (phages) (viral bacterial predators), against VTEC in sprout seeds is proposed as a novel means for microbiological control, as very little research has been conducted with this phage-host system in this respect. Further, phages are highly specific for bacterial hosts, rendering them safe for human consumption and food application. Therefore, it is crucial that phages as biocontrol agents against VTEC are investigated. This project aims to evaluate the phage efficacy against VTEC on sprout seeds. Specific objectives are: (i) Isolation of VTEC-infecting bacteriophages from environmental samples, including sewage, soil and irrigation water; (ii) Baseline characterization, by host range determination (i.e., testing which VTEC strains it is able to infect and kill), morphological classification, and determination of burst size and latent period; (iii) Determination of the in vitro biocontrol ability of selected phages against VTEC at various multiplicities of infection (i.e., phage to VTEC ratios); (iv) Determination of in vivo biocontrol ability of selected phages against VTEC using a bean sprout seed model at the optimal MOI. This project aims to evaluate the efficacy of phages for control of VTEC. Using bacteriophages for control of VTEC represents an alternative means to chemical sanitizers for pathogen management on sprout seeds.

# Friday Oral Presentation Abstracts

Henry Angus 345, 5:00 PM - 6:30 PM

**Title: Image Transitions: Visual Search In a Dynamic World**

**Presenters: Pertels, Yana; Thongprasert, Sarah; Ip, Jessica & Chai, Wendy**

A mental representation is a theoretical entity believed to be the brain's construction of the outside world, which must be flexible in response to a variety of novel situations we face. In particular, mental representations should be flexible with regards to size transformation, since our perception of the object remains the same despite changes to its size. Previous research in size transformation studied the transformation of individual objects, however, our research sought to investigate the transformation of the search space which the objects were embedded in. We employed a visual search paradigm to investigate the effect of dynamically scaling a set of images on the speed of finding a target image among distractor images. The images alternated between a larger size and a smaller size every 500ms. We hypothesized that if the mental representation is invariant to scaling, the search speed would be the same for both the static displays and the displays which alternated between two sizes. Our results showed that the search speed was unaffected by the dynamic displays up until a threshold ratio of 2:1 where the smaller images were half the size of the bigger images. Beyond this threshold, the search speed was slowed down significantly. This suggests that there is a limit to the flexibility of mental representations with regards to size of the search space.

# Friday Oral Presentation Abstracts

Henry Angus 345, 5:00 PM - 6:30 PM

**Title: Who Wants to Find a Lover Online ? - A Study of the Determinants of Online Dating Usage and Its Correlation with the Quality and Long-term Stability of Relationships**

**Presenter: Song, Sibyl**

Online dating has gained increasing popularity in the marriage market. While previous scholars have investigated various aspects of online dating such as efficient matching algorithm, personal and demographic characteristics of online daters, and factors affecting the quality of relationships, there is still space for expansion of knowledge in this field. I will therefore conduct an integrated investigation on the demographic and social determinants of online dating usage and the quality and long term stability of relationships resulted from online dating. I use data from a national telephone survey conducted from April 17th to May 19th in 2013 by Princeton Survey Research Associates International for the Pew Research Center's Internet & American Life Project to explore the aforementioned issues. I use multiple variable Probit regression models to estimate the effects of demographic and social determinants on the propensity to use online dating services and involve in certain online dating related activities, and compare the quality and long term stability of relationships resulted from online dating and offline dating. My findings may contradict, strengthen, or complement previous scholars' research results, and will contribute to the improvement of the design of online dating services.

# Friday Oral Presentation Abstracts

Henry Angus 354, 5:00 PM - 6:30 PM

**Title: Exploring Spliceosomal Diversity in Microsporidia, a clade of Reduced Intracellular Parasites**

**Presenter: Long, Rory**

Eukaryotic genes are a mosaic of exonic protein-coding regions, and non-coding regions known as introns. To produce a functional protein the introns must be removed in a process known as splicing, which is catalyzed by five small nuclear RNAs (snRNAs) and a large complex of proteins. Due to the potential deleterious consequences of intron retention, the splicing mechanism is highly conserved in eukaryotes. However, in rare cases, the process of splicing can diverge, or even be lost altogether. Microsporidia are fungi and intracellular parasites that infect host cells by injecting their cellular contents through a structure known as a polar tube into the host cells cytoplasm, similar to a syringe. Interestingly, microsporidia possess highly reduced genomes with overlapping genes and few non-coding regions including the loss of many, if not all, introns. In concordance with having few introns, microsporidia have been observed to splice these introns at surprisingly low levels; often less than 20% of mRNA produced is predicted to be modified by the spliceosome. This study involves the characterization of the spliceosomes of 21 species of microsporidia and their relatives by bioinformatical strategies in order to assess the effect of genome reduction on spliceosomal complexity. By comparing microsporidian spliceosomes with those species known to have highly complex spliceosomes (such as humans and *Saccharomyces cerevisiae*), it is evident that many proteins and snRNAs previously thought to be necessary in splicing are absent in these highly reduced and unusual eukaryotes.

# Friday Oral Presentation Abstracts

Henry Angus 354, 5:00 PM - 6:30 PM

**Title: Numerical and Experimental Investigation of a Ytterbium Fibre Pre-Amplifier**

**Presenter: Nantel, Megan**

In this project, the propagation of ultra-short (femtosecond) light pulses through optical fiber is studied. A Ytterbium doped fibre amplifier is used to increase the power of light pulses through the process of stimulated emission. As a light pulse propagates through an optical fiber, it is subjected to other effects such as dispersion and self-phase modulation. In order to obtain ultra-short pulses with high peak power, these effects must be managed. To do this, the amplifier system's parameters and the initial conditions of the input pulse need to be optimized. In this project, simulation software was tested, further developed and compared to an experimental system. Initial models were not able to fully simulate the highly non-linear effects and so a more complicated model is currently being investigated.

# Friday Oral Presentation Abstracts

Henry Angus 354, 5:00 PM - 6:30 PM

## **Title: Analysis of the Combined Effects of Maternal Stress and Synthetic Glucocorticoid Administration on Fetal Brain Development**

**Presenters: Ovenden, Grace; Wroot, Hayley & Brinkerhoff, Saskia**

Maternal glucocorticoid (GC) levels increase over the course of gestation to support fetal maturational processes. Women at risk of preterm labour are often administered synthetic glucocorticoids (synGCs), commonly betamethasone, to accelerate fetal lung development in the event of preterm delivery. Fetal exposure to synGCs has been associated with decreased cerebral cortex volume in 6-to-9-year-old children, as well as decreased cell proliferation and dendritic branching in animal models. Given that prenatal maternal anxiety occurs in up to 20% of pregnancies and is associated with elevated endogenous cortisol (glucocorticoid) levels, subsequent administration of synGCs may expose the fetus to supraphysiologic GC levels. This raises concern regarding the combined effects of maternal anxiety and synGC exposures on fetal brain development. Our research will investigate fetal brain hemodynamics as an index of development following these combined exposures. Doppler ultrasound will be used to measure blood flow resistance in the internal carotid and, anterior, middle, and posterior cerebral arteries in third-trimester fetuses. Serum cortisol from maternal third-trimester blood and newborn umbilical cord blood at birth will also be analyzed. We predict that supraphysiologic GC levels will be present in maternal and newborn serum to suggest gestational exposure to elevated GC levels. GC levels will be associated with decreased fetal brain blood flow resistance indicative of impaired brain development in utero. This research is essential to further understand the effects of maternal anxiety and synGC administration on fetal brain development and to assess the risks posed by elevated antenatal GC levels on the developing fetus.

# Friday Oral Presentation Abstracts

Henry Angus 354, 5:00 PM - 6:30 PM

**Title: Low frequency visual stimuli do not evoke rhythmic neural activity in a model for a developing neural circuit**

**Presenters: Safa, Sina & Wong, Jodi**

Individual neurons interact to form complex multi-neuron networks in the brain in order to perform higher-order processes. For example, neural networks cooperate to process sensory stimuli in order to participate in an individual's perception of such stimuli. Correct perception of the spatiotemporal properties of sensory stimuli depends heavily on accurate neural activity. However, much of how the temporal aspect of sensory stimuli is processed by neural circuits is unknown. Here, we set out to investigate the occurrence of entrained rhythmic activity in developing neural circuits induced by the presentation of rhythmic visual stimuli. We performed bolus tectal injections of OGB-1AM, a calcium indicator, in the optic tecta of stage 50 albino *Xenopus laevis* tadpoles in order to visualize neural circuit activity induced by visual stimuli at a single-cell resolution. Patterned visual stimuli and response to such were captured by two-photon laser scanning microscopy. Following a training period of rhythmic visual stimuli, we observed an increase in consecutive responses corresponding to the time interval between presented stimuli. However, follow-up experiments showed that this observed effect is likely a statistical type I error and is not significant. From this, we can conclude that patterned visual stimuli do not evoke rhythmic neural activity in the optic tectum of stage 50 *Xenopus laevis* tadpoles. Possible future directions include the consideration of different molecular mechanisms by presenting different parameters to the model in order to better understand the temporal processing of sensory stimuli.

# Friday Oral Presentation Abstracts

Henry Angus 354, 5:00 PM - 6:30 PM

**Title: Cognitive Neuroplasticity for Children with Learning Difficulties**

**Presenter: Wong, Natalie**

Neuroplasticity, the brain's ability to reorganize itself, has been largely studied in neuroscience and applied in the context of physical rehabilitation. Yet the effects of neuroplasticity in education are underexplored, particularly as it relates to educational capabilities in children with learning difficulties (LDs). In this exploratory study (N = 18; Mage = 13; range = 9-17 years; 16 males), students with LDs attending a private cognitive remediation program were matched with students with LDs who are not attending such program. Findings suggest that cognitive training may not have robust effects on reading and math performance as assessed using the Woodcock-Johnson III, a standardized test of achievement when evaluated at baseline (onset of the study) and then a year later. A larger sample size is needed to conduct a meaningful comparison. This study will be one of the first to investigate the relationship between neuroplasticity and cognitive function in children with LDs. These findings will contribute to our understanding of cognitive neuroplasticity and may inform the structure and curriculum of specialized learning programs for children with LDs.

# Friday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**Do Individual Differences in Incentive Salience Attribution to Reward Cues Modulate the Effects of Reward Cues on Risky Decision Making?**

Akl, Alaa

**Genetic Influences on the Severity of Ethanol-Induced Cell Death in the Developing Prenatal Brain**

Balce, Kristina & Theberge, Emilie

**Short Interpregnancy Intervals, Maternal Folate Levels and Infants Born Small for Gestational Age**

Chen, Buffy

**The Activity of the Brain Dopamine System Correlates with Memory Retention in Humans**

Cheng, Solana & Ivkov, Ana

**Mass Specific Allometry of Discontinuous Gas-Exchange Cycle in Cockroaches**

Cheng, Alex

**Associations between shared goals and marital satisfaction in older couples: A longitudinal study**

Chi, Kevin

**The role of IL-33 in asthma-protective T regulatory cells**

Chuang, Angela; Zhang, Kevin; Chen, David & Gross, Lindsey

**The Effect of Soil Compaction on Photosynthesis, Transpiration and Chlorophyll Levels in the Japanese Katsura Tree**

Dhillon, Amy

**Using a nematode metabolic footprint approach to compare soil food webs in clear-cut versus forest edge habitats**

Fu, Melody & Wang, Lilo

**Maximizing nitrogen availability for crop growth by optimizing the use of organic amendments**

Godinez, Matthew

**Mutation-specific Pharmacological Treatment in Long QT Syndrome Type 2: A Literature Review**

Hari, Kishore; Kazakov, Herman; Ghiam, Mona & Pirzada, Rida

**Whipping Out Bacteria - A New Era of Flagellum-Targeted Antibiotics**

Kanani, Sahil; Yang, Kaitlyn & Kalsi, Pavneet

# Friday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**ATGL-independent roles of CGI-58 in muscle tissue lipolysis**

Khurshid, Vardal; Xu, April & Dissanayake, Ashini

**Prevalence of Home Medication Administration Discrepancies in the Pediatric Emergency Department at BC Children's Hospital**

Kim, Ellen & Yu, Shi-Yuan

**Costs of Healthcare Utilization in Children with Suspected Genetic Disorders of Unknown Cause**

Kim, Ellen

**Physical Activity Programs for Children with Neurodevelopmental Disability: Strengthening Families through Social Networks to Better Support Children**

Kong, Precilia

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**When does wealth enhances happiness?**

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**Dopaminergic Modulation of Behavioural Flexibility in the Medial Orbitofrontal Cortex**

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**Evaluation of ALK-Inhibitors in the Treatment of ALK-Positive Non-Small Cell Lung Cancer**

Low, Alyssa; Lin, Angela & Cheung, Stephanie

**Evaluating an Online CBT Treatment Program for Social Anxiety**

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**How Lameness Affects the Feeding Behaviour of Dairy Cows Around Calving**

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**Development of a Tool to Reduce Sports-related Concussions in Organizations (Using Ice Hockey as a Model Sport)**

Munjal, Vrinda

# Friday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**Towards Robust Classification of Human Activity and Motion Disorder**

Quinlan, Cameron; Shory, Aarushi; He, Amelia & Desouky, Anas

**The Effect Of Social Network Membership On Vaccination Intent**

Roine, Alexandra; Yuan, Michelle & Zhang, Hana

**Mitochondrial fission is involved with functional changes associated with neuronal long-term depression**

Safa, Sina & Wong, Jodi

**Development of an ELISA to measure dehydrocorticosterone levels in mice**

Salehzadeh, Melody

**The Role of Personality and Internalized Homonegativity on Sensation Seeking and Sexual Risk Taking among Men who have Sex with Men.**

Samra, Tarndeeep; Lefebvre, Amber; Liu, Jason & Lau, Parky

**The dawn of cardiovascular neuroprosthetics: Epidural spinal cord stimulation acutely restores cardiovascular function in persons with clinically complete spinal cord injury**

Sarafis, Zoe

**Judgements of Truth and Verbal Deception by Canadian Adolescents: When is a Harsh Truth Okay?**

Shrestha, Claire

**Assessment of infographics as a tool to promote healthy behavior**

Stroud-Drinkwater, Sasha

**A grounded theory analysis of student perceived learning outcomes in an upper year biology course**

Sung, John

**The effect of temperature on the movement rate of green shore crabs, *Hemigrapsus oregonensis***

Uday, Prakruti; MacLellan, Abbey & Pattanshetti, Rutuja

**Application of Nanoparticles in Cancer Treatments**

Yang, Amanda; Noureddine, Bayan; Patel, Ronil & Chai, Kalin

**Evaluation of Sleep and Recognition Memory in the APP/PS1 Mouse Model of Alzheimer's Disease**

Yau, Kiana

**Preservation of isobaric separation capabilities in Penning trap manipulations for large ion clouds**

Yu, Jenny; Li, Amy & Salhotra, Aviral

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Do Individual Differences in Incentive Salience Attribution to Reward Cues Modulate the Effects of Reward Cues on Risky Decision Making?**

**Presenter: Akl, Alaa**

Sign-tracking, or the attribution of incentive salience to reward-predictive cues, has been identified in animal research as a possible vulnerability phenotype for addiction. In humans, only one study has been published on sign-tracking (Garofalo & Pellegrino, 2016); whereas cue-reactivity (behavioral responses to addiction-related stimuli) has been extensively studied. However, it remains unclear if and how these addiction markers are related. The objective of this study was to determine whether sign-tracking predisposes individuals to cue reactivity, in this case the risk enhancement in decision making with reward sensory features. 131 participants performed a task adapted from the aforementioned study, and through eye-movement data were classified according to their propensity to focus on the location of the cue vs reward (sign-trackers vs goal-trackers respectively). In addition, a gambling task involving choosing between two prospects was used in two separate versions: one in which rewards were paired with casino-inspired images and jingles, and another where the rewards were simply stated as a numeric value unaccompanied by other sensory feedback. Risk-promoting effects of sensory reward were evaluated in the cue-sensitive vs cue-insensitive participants. We conclude that: 1) Sign-trackers were more risk-prone than goal-trackers in both versions, due to higher sensitivity to increases in expected reward value, and 2) sensory feedback promoted risk taking across both groups but if anything sign-trackers tended to be less susceptible to this effect. Heightened cue-reactivity does not appear to be part of sign-trackers' behavioral profile.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Genetic Influences on the Severity of Ethanol-Induced Cell Death in the Developing Prenatal Brain**

**Presenters: Balce, Kristina & Theberge, Emilie**

Fetal Alcohol Spectrum Disorder (FASD) describes a group of conditions caused by fetal exposure to alcohol consumed by mothers during pregnancy. These conditions are characterized by abnormal brain development, cognitive and learning deficits, and/or specific patterns of physical defects. With more than 3000 Canadians born annually with FASD, it is the most common preventable cause of developmental disability in Canada. Little is currently known about how alcohol leads to the symptoms of FASD in humans. Research in mouse models has identified ethanol-induced apoptosis (i.e. programmed cell death) as one process contributing to disruption in early brain development. Interestingly, the levels of apoptosis in mice vary depending on genetic background. Exactly how and which genes are involved in susceptibility or resistance to ethanol-induced apoptosis remain largely unknown. In this study, mouse embryos from 28 genetically different strains were exposed to ethanol at embryonic day 9 (E9) of pregnancy, which is equivalent to the first trimester of human development. Apoptotic cells were stained and counted in the brainstem, and strains of high and low susceptibility to apoptosis identified. Quantitative data was analyzed using GeneNetwork, a bioinformatics tool, which identified regions on chromosomes 4 and 14 containing candidate genes that may be involved in susceptibility or resistance to the effects of prenatal alcohol exposure in the developing brain. These findings will play an important role in future development of preventative treatments for FASD at a molecular level, and screening and prevention of FASD in genetically vulnerable populations.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Short Interpregnancy Intervals, Maternal Folate Levels and Infants Born Small for Gestational Age**

**Presenter: Chen, Buffy**

Short interpregnancy intervals (SIPI) have been shown to associate with increased risks for adverse neonatal outcomes including preterm delivery, and babies small for gestational age (SGA). It has been suggested that mechanistically, this association may be explained by folate. Perhaps, these neonatal outcomes arise due to insufficient time for depleted folate levels to recover prior to the second pregnancy. Empirical data is lacking regarding physiological folate levels in pregnant women with SIPI, and relationships between quantified physiological folate levels and neonatal outcomes in women with SIPI. Therefore, we sought to test two hypotheses: women with SIPI would: 1) have lower red blood cell folate (RBCF) levels and 2) be more likely to have SGA babies (defined as <10th percentile). Methods: Using data collected in BC, Canada for a larger study on perinatal psychopathology, we examined women's use of prenatal folic acid supplements, and used Fisher's exact test to compare prenatal RBCF levels and number of SGA infants between women with SIPI (second child conceived  $\leq 24$  months after previous birth,  $n=26$ ) and matched controls (no previous pregnancies, or  $>24$  months between pregnancies,  $n=52$ ). Results: For SIPI and control groups, folic acid supplementations was initiated an average of 40 and 38 weeks prior to current pregnancy, respectively. There were no significant differences in either mean RBCF levels or frequency of SGA babies between groups. Conclusion: These first data about RBCF levels in the context of SIPI suggest that continued FA supplementation following an initial pregnancy may restore maternal folate reserves sufficiently to mitigate the potential for adverse outcomes of the second pregnancy.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Activity of the Brain Dopamine System Correlates with Memory Retention in Humans**

**Presenters: Cheng, Solana & Ivkov, Ana**

The neurotransmitter dopamine appears to play a role in the process of forming long term memories. Studies show that humans have better memory retention when dopamine levels are elevated in brain regions including the ventral tegmental area and the hippocampus. Additionally, multiple experiments have determined that subjects recall information more accurately if they are interested in the subject that is being tested. This research aims to explore how dopamine levels and interest in the topic may affect memory formation, and in extension, memory retention in healthy young adults, age 18 to 30. Subjects will be injected with a radioactive precursor of dopamine prior to entering a positron emission tomography scanner and will then watch an informational video. Baseline images will be subtracted from images taken while the subject watches the video, achieving an image showing only the change that occurred during the video. Directly after the video, a supplementary test will survey the participants for their interest in the video. Four days later, participants will be brought back to perform a recall test with questions that ask about the content and of the video. We expect to find higher signals of dopamine in the ventral tegmental area and the hippocampus in people who score better on the recall test and who have a higher interest in the video. These results may provide a biological basis for better memory linked to interest in subject matter, and could contribute towards facilitating better classroom learning environments or teaching methods.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Mass Specific Allometry of Discontinuous Gas-Exchange Cycle in Cockroaches**

**Presenter: Cheng, Alex**

Insects were among the first terrestrial organisms to have arisen on earth and have grown to encompass much of the presently described animal species. By taking on a variety of forms, insects have colonized much of earth's terrestrial habitats since their evolutionary origin. Along their subsequent expansion into different habitats, insects were constantly challenged to adapt their environment. These selective pressures resulted in the evolution of their fundamental physiology such as the presence of an air-filled respiratory system which delivers gases directly to the metabolically active cells. This method of gas delivery eliminated the limitations imposed by a cardiovascular exchange system but places the cells at risk of desiccation and environmental damages. To overcome this, insects have developed a series of sealable pores call spiracles at the point of environmental entry and has adapted several special patterns of gas exchange to suit its metabolic needs. One of the most researched and unique of these patterns is the discontinued gas-exchange cycle (DGC). With DGCs being known for having a highly debated evolutionary origin in insects, researcher still have much to learn about this gas-exchange pattern. Though the physical aspect of DGCs has been well documented, the relationships between these characteristics and other internal variables and external factors have not been explored to the same extent. By examining the characteristics of DGC against masses of three cockroach species, the current study found that the metabolic curve of cockroaches aligned with that of mammals and that abdominal pumping rates seems to operate independantly of mass.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Associations between shared goals and marital satisfaction in older couples: A longitudinal study**

**Presenter: Chi, Kevin**

Spousal support is an important determinant of marital satisfaction, a topic that has gained much attention and concern over the past decade (Xu & Burleson, 2009). However, few studies have examined the links between different types of spousal support for goals (e.g. emotional or informational) and marital satisfaction (Xu & Burleson, 2009). In particular, the area of spousal goal support remains relatively unexplored, even though the pursuit of goals is an important part of one's life. Furthermore, most studies have focused on individual models of relationship function, which may be problematic as an individual's goals are often not pursued alone but are interdependent with their partner (Robles, Slatcher, Trombello, & McGinn, 2014). Therefore, this study takes a dyadic approach in examining the links between the pursuit of common goals with one's partner and marital satisfaction. The types of goals (specifically, social or instrumental) and whether the individual's gender or ethnicity moderates associations are also examined. The study uses cross-sectional measures from 118 heterosexual older couples (N= 236; Mean age= 71.0 years, SD= 5.99, age range= 60-87 years; 56.8% Caucasian; 35.2% Asian). Preliminary results show that individuals who perceive their goals as common with their partner display greater relationship satisfaction. In addition, males show significantly more relationship satisfaction than females and Caucasians show significantly more relationship satisfaction than other ethnicities. Furthermore, there is a stronger association between the number of shared goals with one's partner and relationship satisfaction when an individual identifies as East Asian as opposed to other ethnicities.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The role of IL-33 in asthma-protective T regulatory cells**

**Presenters: Chuang, Angela; Zhang, Kevin; Chen, David & Gross, Lindsey**

Asthma is a common inflammatory disease affecting approximately 3 million Canadians. It causes coughing, wheezing, breathlessness, chest tightness, and can sometimes lead to death. Increased levels of interleukin-33 (IL-33) have been discovered in asthma patients. IL-33 is a protein released during lung tissue damage that exacerbates asthma by recruiting eosinophils. Recently, it was found that IL-33 also expands a type of immune cell called T regulatory cells (Tregs). Tregs maintain self-tolerance, preventing the body from destroying itself and can control inflammation associated with asthma. Importantly, differences in the amount of IL-33 may either exacerbate or reduce inflammation. In this study, we will investigate whether IL-33 can increase Treg levels in mice to reduce the degree of the inflammatory response in asthma. We will use a mouse model of airway inflammation, in which asthma is triggered by injecting an allergen. Varying concentrations of IL-33 will be given administered to mice, in which asthma was induced. Following injection of IL-33, mice will be challenged with allergen-induced asthma. Flow cytometry and BAL fluid analysis will be used to determine the percentage of Tregs in the lungs and blood, as well as the extent of airway inflammation, determined by the number of eosinophils. Results will be compared to a control group of mice that did not receive IL-33. If a relationship between IL-33 and Tregs exists, we would expect the severity of airway inflammation in mice to decrease with increasing amounts of administered IL-33. If successful, these findings will support a new therapeutic approach for asthma using IL-33- expanded Tregs.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Effect of Soil Compaction on Photosynthesis, Transpiration and Chlorophyll Levels in the Japanese Katsura Tree**

**Presenter: Dhillon, Amy**

The efficient exchange of gases, especially carbon dioxide and water vapor, is important for the growth and development of plants. Photosynthesis is the process by which plants convert carbon dioxide into sugars in the presence of sunlight. Transpiration is the process by which plants lose water through small pores on the surface of the leaves, called stomata. Both photosynthesis and transpiration rates are regulated by environmental factors and developmental changes through stomatal opening and closing. This study focused on the effects of soil compaction, particularly in cemented areas, on chlorophyll, photosynthesis and transpiration levels in the Japanese Katsura. The CI-340 Handheld Photosynthesis Machine was used to measure photosynthesis and transpiration rates. The CL-01 Chlorophyll Content System was used to measure chlorophyll levels. While transpiration rates were relatively similar, the trees that were experiencing soil compaction had much lower photosynthesis rates. This suggests that plants growing in soil compaction conditions may have decreased access to essential nutrients like nitrogen. Previous research regarding soil compaction has shown varying results from having no effect to decreases in both photosynthesis and transpiration rates. In summary, our study showed that the compaction of soil caused decreased photosynthesis rates and an overall yellowing of leaves of the Japanese Katsura. Furthermore, the results obtained from this study may have implications for future planting decisions in urban areas for the Japanese Katsura.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Using a nematode metabolic footprint approach to compare soil food webs in clear-cut versus forest edge habitats**

**Presenters: Fu, Melody & Wang, Lilo**

Soil nematodes play important roles in the proper functioning of soil food webs. Healthy soil food webs are essential for ecosystems and can be assessed using analyses of nematodes. Relatively few studies have used a metabolic footprint (MF) approach, which calculates the total carbon consumed by nematodes for both production and respiration during their lifespan, to represent the carbon availability in soil. For our proposed study, we will use MF analysis to compare the soil food web from clear-cut versus forest edge habitats from the University of British Columbia's Malcolm Knapp Research Forest, Maple Ridge, BC, Canada. Soil samples will be collected in a stratified random sampling design with composite samples from six forest edge sites (n=6) and six clear-cut sites (n=6). MF is obtained using microscopy and mathematical equations to estimate nematode biomass and carbon use. Due to lower microbial biomass and plant roots in clear-cut soil, we hypothesize that the MF will be higher in forest edges than clear-cuts. A higher MF is assumed to indicate better soil quality, as a higher bacteria-feeding and fungal-feeding nematodes MF suggests more microbes are present, and a higher herbivore MF suggests more plant roots and greater soil aggregation stability of soil. Our results will be compiled to serve as informative preliminary data for subsequent field experiments in the sites. The results will also be useful for understanding how soil food webs shift with respect to carbon utilization and will provide information on ecosystem health in forested and clear-cut habitats.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Maximizing nitrogen availability for crop growth by optimizing the use of organic amendments**

**Presenter: Godinez, Matthew**

Nitrogen (N) is an important nutrient used in agriculture to increase crop production. Loss of soil N due to crop harvesting has led farmers to apply N-rich fertilizers to replenish the soil of its lost nutrients. This has potentially led to over-fertilization. This study looks at optimizing the use of organic amendments to maximize N availability for crop growth, with four treatments using different amendments and crops. For each crop, the %N content was assessed to determine how much N is used for its marketable biomass. The N removal rate of each crop shows how much N is removed from the field. Comparing the plant-available nitrogen (PAN) in each soil amendment, %N content and N removal rate to the BC Production Guide suggested N requirements of each crop, can help determine if more N is being applied to the soil than necessary. Results showed applying more N did not guarantee higher yields and high N-requiring crops used little N in their marketable biomass. Fennel had an optimum N requirement range and treatments that had PAN greater than this range had lower yields than the treatment that had PAN within this range. Cauliflower crops required over 220 kg N/ha but only 4-5 %N was found in the marketable biomass. Beet crops had lower N requirements but had high yields and N removal rates, thus they could be more efficient in their N use. Knowing the PAN in amendments can be useful in matching future N crop requirements so less over-fertilization occurs.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Mutation-specific Pharmacological Treatment in Long QT Syndrome Type 2: A Literature Review**

**Presenters: Hari, Kishore; Kazakov, Herman; Ghiam, Mona & Pirzada, Rida**

Long QT Syndrome (LQTS) is an inherited cardiac disorder that prolongs electrical event duration, and may cause sudden death. In LQTS Type 2 (LQT2), a mutated hERG gene leads to dysfunction of a potassium channel important for proper heart rhythm. Most hERG mutations are found in regions regulating cellular trafficking of the channel, promoting research for possible therapeutic approaches. Our aim is to analyze which pharmacotherapy best corrects trafficking abnormalities. A literature review of current hERG research in LQTS was conducted. Various pharmaceuticals were analyzed, thus allowing us to investigate the mechanisms by which these drugs correct the defects. We then compared the therapeutic efficacies of these medications through analysis of two studies: Delisle et al. (2003) and Rajamani et al. (2002). Both studies present data on the hERG variant G601S. In Delisle et al., the channel was found to be rescued by 1  $\mu$ M Thapsigargin in as quickly as 2 hours after administration, resulting in restoration of the hERG current. In Rajamani et al., 1  $\mu$ M Fexofenadine rescued the channel and restored the hERG current after 24 hours. This confirms that Thapsigargin's and Fexofenadine's rescue mechanisms are effective in restoring hERG current, and potentially protecting individuals with LQT2 from deadly heart rhythms. Our results suggest that Thapsigargin is most effective at combatting trafficking defects in hERG. We propose further study into the long-term efficacy of the mentioned therapeutics in the setting of LQT2.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Whipping Out Bacteria - A New Era of Flagellum-Targeted Antibiotics**

**Presenters: Kanani, Sahil; Yang, Kaitlyn & Kalsi, Pavneet**

The flagellum, informally known as the bacterial 'whip', is a biomechanical marvel that enables bacterial motility, allowing bacteria to propel through myriad environments in order to survive. Important in enhancing the virulence or ability of the bacterium to cause disease, the flagellum works using a macromolecular motor whose structure is not yet fully known. Because bacteria such as *E. coli* and *Salmonella typhi* are known to rely on their flagella to cause stomach ulcers and epithelial cell invasions as part of their intricate attacks on multicellular organisms, it is important to investigate the structure of the flagellum when considering potential treatments for the diseases caused by such bacteria. However, most structural analyses of the flagellum have so far focused on its rotor, with less work having been targeted towards the stator, which is responsible for generating the mechanical work needed to power the rotation of the flagellar motor. The aim of this project is therefore to propose a method of using a structural imaging technique known as cryo-electron microscopy (cryo-EM) to resolve the structure of one such group of proteins, identified as MotA and MotB, found in the flagellar stator. Knowledge of the structure of these proteins is deemed necessary in proposing a structure-based drug design that utilizes the flagellar stator as a novel drug target for antibiotics.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: ATGL-independent roles of CGI-58 in muscle tissue lipolysis**

**Presenters: Khurshid, Vardal; Xu, April & Dissanayake, Ashini**

Cells in our bodies have many regulatory processes that maintain metabolic balance. Disruption in any part of a mechanism can lead to serious illness. This includes the digestion of fats, where mutations can lead to obesity or diabetes. Stored fats in tissues are catabolized by an enzyme called adipose triglyceride lipase (ATGL). ATGL is activated by a protein called CGI-58. It is important to study CGI-58, as mutations in this protein have been linked to Chanarin-Dorfman Syndrome (CDS), a rare genetic disease where fatty acids accumulate excessively in organs and tissues. This accumulation can lead to an enlarged liver, clouding of lenses, difficulty coordinating movement, and intellectual disabilities. To date, most studies on CGI-58 have focused on its role in ATGL activation. However, it was recently discovered that CGI-58 is able to regulate fat metabolism in the absence of ATGL. Therefore, our study aims to investigate how CGI-58 affects lipolysis in muscle tissue independently of ATGL. We are focusing on muscle tissue due to the myopathic symptoms present in CDS. Our proposed methodology involves inactivating the ATGL gene in the skeletal muscle cells of a hundred adult (five weeks old) Long-Evans rats and immunoprecipitating proteins interacting with CGI-58. The immunoprecipitated proteins will be identified by mass spectrometry. We expect to identify numerous regulatory proteins that interact with CGI-58. We can then investigate the functions of these individual proteins, how they interact with each other and with CGI-58, and how these interactions affect lipolysis in muscle tissue.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Prevalence of Home Medication Administration Discrepancies in the Pediatric Emergency Department at BC Children's Hospital**

**Presenters: Kim, Ellen & Yu, Shi-Yuan**

Ensuring the continuity of patients' regularly-scheduled home medications upon hospital admission is important in the management of patient health and care. Inaccurate medication administration and incomplete medication histories in hospitals are common, and these discrepancies can potentially cause clinical deterioration and adverse effects. Specifically, the prevalence of medication discrepancies is high in urgent care settings such as the emergency department. More than 43,000 children visit British Columbia's primary pediatric emergency department every year, but we are not aware of any studies investigating the incidence of medication discrepancies specifically in the pediatric emergency department. Therefore, in our study, we aimed to quantify the prevalence of home medication discrepancies in the pediatric emergency department. A selection of 601 pediatric patients visiting the emergency department during a 7-week period were retrospectively reviewed by comparing the information presented on their paper emergency department charts against their province-wide electronic medication dispensing record. 139 pediatric patients on home medications were ultimately reviewed from the total of 601 patients. The electronic medication dispensing records were used as the point of reference to determine the accuracy of home medication history recorded in the emergency department, as well as the appropriateness of the administration of the medications in the department. In summary, this simple cross check revealed that pediatric patients who are on regularly-scheduled medication(s) at home do not achieve continuity of their medications when staying in the emergency department, with many home medications completely omitted while in the department. Furthermore, medication histories are often incomplete or inaccurate. Looking onwards, we recommend efforts be made to improve the process of medication history taking and medication administration in the pediatric ED. Additional research is desired to investigate: the feasibility of additional staff dedicated to medication reconciliation, the impact of medication reconciliation on workflow, and the validity of using provincial prescription filling records as medication histories.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Costs of Healthcare Utilization in Children with Suspected Genetic Disorders of Unknown Cause**

**Presenter: Kim, Ellen**

The role of GWS (genome-wide sequencing) has been advancing as a diagnostic tool for children with undiagnosed disorders of suspected genetic origin, but the relatively high cost of GWS makes economic evaluation of this specialized service necessary before it can be offered to a broader patient population. The CAUSES Clinic is a diagnostic GWS program at B.C. Children's Hospital (BCCH) in Vancouver, British Columbia, and the TIDE Complex Clinic at BCCH provides diagnosis, prevention, and treatment for children with intellectual disability (ID). Children at the TIDE Clinic are often concomitantly enrolled in the CAUSES Clinic to obtain a diagnosis for their disabilities of suspected genetic origin. While existing studies have calculated the total cost of prior testing for patients receiving diagnostic GWS, in this study we aim to characterize the changes in healthcare utilization over the lifetime of children with chronic conditions of suspected genetic origin, and to estimate the accumulation of healthcare utilization costs over time. Patients concomitantly enrolled in both clinics were retrospectively reviewed through patient records and hospital-wide electronic medical records, and based on unit costs for various healthcare resources, the total cost of healthcare utilization was estimated. The results indicate that there is a steady accumulation of costs over the lifetime of these children, with testing and physician costs accountable for a significant portion of the total cost. Our findings suggest potential cost savings resulting from an earlier diagnosis (e.g. through GWS) and the need for a more comprehensive accounting of diagnosis-related costs when evaluating the healthcare system impacts of GWS as a diagnostic tool.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Physical Activity Programs for Children with Neurodevelopmental Disability: Strengthening Families through Social Networks to Better Support Children**

**Presenter: Kong, Precilia**

The benefits of Physical Activity Programs (PAPs) do not discriminate on the basis of ability level: they are universal for all children, including those with disabilities. For children and youth with neurodevelopmental disorders (NDD), such programs help to promote self-confidence, independence, and motor skill development. They also teach invaluable skills such as teamwork and collaboration, patience, and discipline. In addition, these programs have the potential to improve various elements of a families' experience of disability, for example, their social support network, quality of life, coping behaviours, and resilience. This exploratory study investigates the potential PAPs have as an avenue for facilitating support between families, the impact of PAP-related family social networks on families, and the importance of these PAP-networks in comparison to other networks to support families of children with NDD. We are in the process of recruiting 50 families raising a child with NDD (2-24 years) attending PAPs in British Columbia. Information from each family will be collected at baseline and after 3 months using standardized scales, surveys and interviews and will be analyzed using a mixed methods approach. Preliminary data from studying the first 15 families illustrates that PAPs represent a unique platform that can potentially strengthen both families and children with NDD simultaneously. Early anecdotal evidence extracted from the recorded interviews reinforce a synergistic relationship which advocates that strengthened families provide optimal care to their children. If such interaction proves to be significant, we hope to provoke further discussion surrounding the cost-benefits of family-integrated PAPs and where to best allocate our finite resources to best advantage these families and children.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Lecture Capture Analysis in Pharmacy**

**Presenter: Larson, Kane**

The Faculty of Pharmaceutical Sciences has used lecture capture (LC) for six years. Initiated in 2010 as an “opt-in” system for faculty, LC has become a fundamental learning technology in the pharmacy curriculum. Following-up an original study published in 2014, the purpose of this study was to update our understanding of the effectiveness and impact of LC in the Faculty. Using previously published methods, a 38-question survey using a Likert scale was administered in April 2016 to collect information from students and faculty in three specific areas: usage, attendance effects, and learning impacts. Numeric data were analyzed using descriptive statistics while written comments were coded for themes and critical comments. Analytics from Mediasite®, the LC recording platform, were used to extract viewing patterns. A representative sample of faculty (by rank) and student body (across all four years) responded, including 33 faculty (46%) and 249 students (28%). Major findings indicated that students were overwhelmingly supportive of the LC program emphasizing it increased their understanding (95% of respondents), retention (92%), focus (58%), and engagement (39%); 47% said LC improved their note taking. Interestingly, student views increased from 9,3331 in 2011/2012 to 45,040 in 2015/2016. For faculty, 70% agreed that LC positively impacted student learning while approximately half noticed increased student focus and engagement; 50% insisted LC negatively impacts attendance. These results provide compelling support for continued use of the LC system in our pharmacy programs. Recommendations include switching from an “opt-in” to an “opt-out” system for faculty and streamlining access for students.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: When does wealth enhances happiness?**

**Presenter: Lee, Alice**

This study examined the relationship between people's happiness and their wealth, and how this association might be explained by how people spend their time. Some current research shows increased happiness as a function of having greater wealth, whereas other research indicates no such links. To investigate this discrepancy, we examined subjective financial well-being—how people evaluate their own financial success—to measure their beliefs in economic prosperity in addition to measuring their objective levels of wealth. Several variables were extracted from a large scale nationally representative survey in the US (N=5000) including income, financial satisfaction, well-being, demographics, and time use variables. Regression analyses were completed to find out the connections among these variables and happiness. We found that less financially confident people tend to be happier when they value time and volunteer more, whereas more financially confident people show the opposite result. The current research adds knowledge to previous inconsistent findings about the association between wealth and happiness by examining how financial security in addition to actual wealth impact people's well-being potentially by changing how they spend their time.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Dopaminergic Modulation of Behavioural Flexibility in the Medial Orbitofrontal Cortex**

**Presenter: Li, Olivia**

Behavioural flexibility is a higher-order cognitive function that enables us to adapt to a changing environment with dynamic reward contingencies. Patients with perturbations to their mesocorticolimbic dopamine (DA) system, as seen in those with schizophrenia or substance abuse disorders, often exhibit inflexible decision-making strategies, highlighting the clinical importance of understanding the neural circuitry underlying these effects. In rats, inactivating the medial orbitofrontal cortex (mOFC) impairs behavioural flexibility, but one question that remains unanswered pertains to the neurochemical modulation of mOFC function. Our study examined the role of mOFC DA D1 and D2 receptors during a probabilistic reversal learning task. One lever was initially designated the “correct” lever, delivering one sugar pellet reward 80% of the time. The other was designated the “incorrect” lever, but was associated with a 20% chance of receiving one sugar pellet reward. After making 8 consecutive “correct” choices, the rat scored one reversal and the reward contingencies switched. The number of reversals, errors, and the win-stay/lose-shift ratios were measured to evaluate performance. Well-trained rats received microinfusions of a D1 or D2 agonist or antagonist into the mOFC prior to task performance. D1 antagonism and D2 agonism reduced the number of reversals completed within one session, while D2 antagonism actually facilitated this form of flexibility. Interestingly, these effects were especially apparent during the initial discrimination of the task. These findings suggest that DA receptors within the mOFC play dissociable and opposing roles in facilitating behavioural flexibility and contribute to future pharmacotherapeutic development for patients with DA perturbations.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Role of Hyperpolarization-Activated Cyclic Nucleotide-Gated Potassium Channels (HCN) in Acid-Base Regulation in Freshwater Teleost Fish**

**Presenter: Logan, Curt & Kainth, Harmit**

Acid-base balance is required for proper physiological functioning in all animals; therefore, the ability to correct acid-base disturbance is paramount for animal performance. Beside others, excretion of ammonia (an acidic-waste product of all animals) has been identified as a mechanism contributing to acid-base balance in many vertebrates and invertebrates.

The hyperpolarization-activated cyclic nucleotide-gated potassium channels (HCN) are a family of proteins found throughout the animal kingdom. Interestingly, a specific HCN, HCN-2 in mammalian kidney has been shown to not only transport potassium, but also ammonia.

Furthermore, upon disruption of acid-base balance mRNA levels of HCN-2 are significantly lowered in mammalian kidney and crustacean gills implying a relationship between acid-base balance and the presence of HCN proteins.

This study aims to determine the role of HCN-2 in acid-base regulation in a freshwater fish, the goldfish *Carassius auratus*. The goldfish is a highly interesting model system to investigate as it has two sites associated with acid-base regulation, the kidney and gill.

Acid-base balance will be disrupted in treatments via high environmental ammonia conditions and high potassium diets. Our study will investigate the goldfish's response to acid-base disturbance on the genetic and physiological level by measuring HCN-2 mRNA expression, protein location and abundance, and ion excretion over gill and kidney membranes. Due to the relatively unchanged and constant nature of HCN proteins within and among animal groups, characterizing this protein as in our study might yield results applicable to human medical conditions relating to potassium and acid-base status, including hyperkalemia and/or metabolic acidosis.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

## **Title: Evaluation of ALK-Inhibitors in the Treatment of ALK-Positive Non-Small Cell Lung Cancer**

**Presenters: Low, Alyssa; Lin, Angela & Cheung, Stephanie**

Lung cancer is among the most common and deadliest of cancer types. Approximately 3-7% of non-small cell lung cancers (NSCLC) contain a rearrangement or fusion of a gene that codes for anaplastic lymphoma kinase (ALK), a tyrosine kinase enzyme responsible for facilitating signaling pathways for cell growth, leading to its abnormal activation. This ALK-positive subset of lung cancer is currently being treated with ALK inhibitors, drugs that bind to ALK to block its signaling pathway. Studies have shown that these targeted anticancer drugs are much more effective than general chemotherapy for the treatment of NSCLC with ALK fusions. Crizotinib was the first ALK inhibitor approved by the U.S. Food and Drug Administration (FDA) for treatment of ALK-positive NSCLC and is commonly used as a first line treatment. Two second-generation inhibitors, ceritinib and alectinib, were later developed with improvements in the central nervous system penetration and the ability to act on crizotinib resistant ALK fusions. While ceritinib and alectinib are commonly used after resistance to crizotinib has been developed, it is currently unknown if the overall survival can be improved by rearranging the sequence of ALK inhibitor administration or through co-administration. In our research, we intend to use data collected from independent studies of crizotinib, ceritinib, and alectinib to compare their effectiveness as first line treatments for NSCLC. Studies with promising results in favour of ceritinib and alectinib in first line treatments are emerging and findings from this research may give insights into novel dosing regimens through different combinations of these drugs to provide the most effective treatment.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Evaluating an Online CBT Treatment Program for Social Anxiety**

**Presenter: McCall, Hugh**

Although social anxiety is one of the most common mental disorders, and is associated with significant distress and functional impairment, its rates of treatment remain low. Online cognitive behavioral therapy (CBT) programs are well situated to surmount some of the major barriers to treatment of social anxiety, such as financial and confidentiality concerns, but research shows that most such programs are only marginally effective without the support of human-delivered therapy. The current study consists of a randomized control trial testing the effectiveness of a new program, Overcome Social Anxiety, which was recently created to address the shortcomings of earlier online CBT programs. We report the results of this program's impact on social anxiety symptoms and life satisfaction among an initial group (N = 6 experimental, 10 control) of socially anxious but otherwise healthy university students over a four-month period. We expect this study to have practical implications both for the treatment of social anxiety and the design of future online treatment programs.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: How Lameness Affects the Feeding Behaviour of Dairy Cows Around Calving**

**Presenter: McDonald, Paige**

Lameness is a painful condition for dairy cows caused by hoof and leg ailments. Lameness causes economic loss to farmers and increases the risk of other diseases and culling. The transition period is the 3 weeks before and 3 weeks after calving. Previous studies have shown that changes in feeding behaviour during the transition period can indicate disease; however, less is known about how lameness affects these feeding changes. The objective of this study is to examine the feeding behaviour of lame cows during the 2 weeks before calving. Here's how it worked: for the 3 weeks before calving, 20 cows were housed in a dynamic group in free stall pens with 24 lying stalls. 12 electronic feeding bins automatically recorded the individual feed intake and feeding duration of each cow. Cow locomotion was video recorded and scored using a 5-point numerical rating system. This system looks at 6 gait attributes while a cow walks. A rating of 3 or higher indicates lameness. 8 lame cows were matched with a control group of 8 non-lame cows. Preliminary results have shown that lame cows had reduced feed intake, reduced feeding duration, and reduced number of visits to the feeder during the week before calving compared to non-lame cows. The results of this study can highlight the importance of providing low competition feeding environments for lame cows during the transition period. Further research is needed on ways to identify lame cows earlier. Identifying lameness earlier allows for quicker treatment and faster recovery.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Development of a Tool to Reduce Sports-related Concussions in Organizations (Using Ice Hockey as a Model Sport)**

**Presenter: Munjal, Vrinda**

Millions of concussions occur annually, many of which occur in sports context. Sports-related concussions can result in cognitive and emotional impairments. It is critical for sports-organizations to invest in concussion prevention and risk assessment to ensure safety of their athletes. We have developed the Sports Organization Concussion Risk Assessment Tool (SOCRAT) to assist sport organizations in assessing the overall risk of concussion at a team level by identifying key risk factors. Using ice hockey as the model sport, we identified the risk factors of concussion by conducting a literature review. We then modified a common engineering application tool called the "Failure Mode and Effect Analysis (FMEA)" to develop a new algorithm, which combines the published data regarding severity and the probability of occurrence of a concussion of each of the identified risk factors. Data from the literature that provided incidence rate ratios (IRR) or incident rates (IR), sample sizes, and a concussion severity measure were used. We identified the age, history of previous concussion, previous body checking experience, allowance of body checking, type of helmet worn and the game or practice environment as risk factors for concussions in ice hockey. These risk factors and the data collected from different articles were incorporated into the algorithm, resulting in: 1) a Risk Priority Number (RPN) for each risk factor, and 2) an overall RPN, which takes into account all risk factors, providing an estimate of the risk in a given circumstance. Sports organizations can use the SOCRAT tool to reduce their risk of concussion by modifying the identified critical risk factors through an iterative process. Future research will involve deploying the SOCRAT tool in sports organizations then verifying its effectiveness in evaluating and minimizing the risk of concussion.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Towards Robust Classification of Human Activity and Motion Disorder**

**Presenters: Quinlan, Cameron; Shory, Aarushi; He, Amelia & Desouky, Anas**

As we know there has been a rapid increase in smartphones which are equipped with integrated accelerometers, gyroscopes, etc. The devices help us in providing opportunities for collecting and monitoring of data for various purposes. One application can be Human Activity Recognition (HAR) systems that play a key role in remote patient activity monitoring i.e. on body sensors that play an important role in recognizing human activity, preferably for people with disabilities and elderly. The Human Activity Recognition follows a Machine learning structure. Raw sensor signals are collected, processed, and segmented into time windows. Feature extraction is then performed to retrieve relevant information from sensor signals over each window. Finally, a classifier is constructed. In this project, we introduce a robust HAR system capable of identifying six different classes of body movements (Walking Straight, Walking Downstairs, Walking Upstairs, Sitting, Standing and Laying down) with high accuracy. A smartphone worn on the subject's waist is used as a sensing unit, while the accelerometer signals are recorded. The accuracy depends upon good feature extraction methods. Therefore, the most discriminant features are extracted from the captured data, the features pertinent to the correct class are selected, and the "Random Forest" classifier is used for the classification. The Random forest classifier is a technique where multiple classifiers (called trees) are used and the consensus is taken as the prediction. We examine the performance of the proposed detection method over a publicly available HAR dataset. The superiority of the proposed method is verified by comparing its detection performance to those of the state-of-the-art methods. An overall classification accuracy of 98.47% has been achieved. We believe the proposed approach can play an important role in Human Activity Recognition using wearable sensors especially in real time applications also the study can also be used to guide smartphone HAR system development for populations with differing movement characteristics, identifying emergency and progress outside hospitals.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Effect Of Social Network Membership On Vaccination Intent**

**Presenters: Roine, Alexandra; Yuan, Michelle & Zhang, Hana**

The goal of vaccination is to achieve herd immunity, where the majority of a population is immunized against a disease. For influenza, it is estimated that if 90% of a population is vaccinated, even unvaccinated individuals will be protected. Contracting influenza may result in economic and social costs, including time lost at work, hospitalization, and mortality. There is currently limited research relating influenza vaccination intent to social networks. Homophily is when individuals tend to associate with similar others. Networks based on homophily share common values that may include vaccination intent. Our research investigates this topic by sampling groups of first-year UBC students living in on-campus residences, for whom the main consequences of influenza contraction are loss of study and work time. This demographic is ideal because students are typically open-minded, and can be strongly influenced by their social networks. Residents usually stay on campus more often than others, and tend to form close-knit groups. With a cross-sectional approach, we will implement stratified sampling, where each dormitory house represents a strata. We will survey students for their house, their intention to be vaccinated, and the names of two friends living in residence. To preserve anonymity and track social connections, each participant will be assigned a number. Using a Chi-Square test, we will determine whether our alternative hypothesis, that an association between social networks and vaccination intent exists, is true. This study can lead to identifying which networks lack vaccination intent so that healthcare providers can assess how to reach herd immunity.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Mitochondrial fission is involved with functional changes associated with neuronal long-term depression**

**Presenters: Safa, Sina & Wong, Jodi**

Mitochondria are cellular organelles found numerously in most cells. They have been long-known to generate energy used in essential cellular processes. Moreover, it has been shown that mitochondria can divide (Fission) or join one another (Fusion). Our research group has found that mitochondrial fission is involved with neuronal plasticity. Specifically, neurons that undergo LTD (Long-Term Depression) have a higher rate of mitochondrial fission when compared to those that undergo LTP (Long-Term Potentiation). However, the mechanistic role of mitochondrial fission and fusion in the development of these processes is unknown, and its abnormal function may be involved in the disorders that affect neuronal development such as Autism. Here, we seek to elucidate the neural mechanisms through which mitochondrial fission or fusion affects neuronal function and structure. Using in-vivo two-photon calcium imaging of stage 50 albino *Xenopus Laevis* tadpoles, spaced- and invariant-light training paradigms were presented to induce somatic LTP and LTD, respectively, in order to search for correlations between mitochondrial fission and neuroplastic processes. To investigate a causal effect between mitochondrial fission and neuronal plasticity, we will use the drug Mdivi-1, a peptide inhibitor of Drp-1, to block mitochondrial fission and observe any changes on the occurrence of LTP or LTD amongst neurons. Preliminary results show an occurrence of plasticity during mitochondrial fission blockade, but comparisons to experimental controls are yet to be done.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Development of an ELISA to measure dehydrocorticosterone levels in mice**

**Presenter: Salehzadeh, Melody**

Glucocorticoids (GCs) are steroid hormones secreted by the adrenal glands in response to a variety of stressors to coordinate animal physiology. The active circulating GC in humans is cortisol and in mice is corticosterone. GCs are critical throughout life, starting with their crucial role in the development of the fetus and continuing with their roles in regulating metabolic and immunological functions of adults. Interestingly, some organs, traditionally thought of as passive recipients of adrenally-produced GCs, have been shown to locally produce their own GCs. These organs express all the necessary GC-synthetic and regenerative enzymes. Recent evidence suggests that local production of GCs relies more heavily on regenerating GCs from GC metabolites than on synthesizing GCs from GC precursors. Dehydrocorticosterone (DHC) is the inactive metabolite of corticosterone and remains largely understudied. Currently, there are no commercially available methods to measure the levels of DHC in circulation or tissues. We developed a sensitive and specific enzyme-linked immunosorbent assay for measurement of DHC in both blood and tissues of mice at different ages. Preliminary data show that the concentration of DHC in the serum is approximately 10-fold lower than that of corticosterone. This study provides preliminary, yet crucial, data to help elucidate how GCs are locally regenerated from circulating GC metabolites, which is a fundamental process in stress physiology and immune regulation.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The Role of Personality and Internalized Homonegativity on Sensation Seeking and Sexual Risk Taking among Men who have Sex with Men.**

**Presenters: Samra, Tarndeeep; Lefebvre, Amber; Liu, Jason & Lau, Parky**

Elevated rates of HIV among men who have sex with men (MSM) in Vancouver, BC is a primary health concern. Sexual risk-taking behaviours, such as unprotected anal intercourse (UAI) with serodiscordant/unknown partners, may contribute to HIV transmission. Previous research shows that sensation seeking is a major contributor to risk-taking (Hoyle et al., 2000). However, less research has examined the relationships between specific social/personality factors and sensation seeking. We propose to examine the role of the “Big-Five” personality dimensions (i.e., Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness ) and internalized homonegativity on predicting sensation seeking and subsequently, sexual risk-taking. 200 MSM will be recruited either online or through word of mouth. The 5-factor personality model will be assessed through the Revised NEO Personality Inventory (Costa & McCrae, 1992). The Internalized Homonegativity Inventory (Mayfield, 2001) will examine negative attitudes towards one’s own homosexuality. The Sexual Sensation Seeking Scale (Kalichman et al., 2010) will be administered to quantify participants’ propensity for exciting, optimal, and novel stimulation. Finally, sexual risk-taking in the last six months will be assessed using the Kinsey Institute Sexual Activity and Condom Use Questionnaire (Bancroft et al. 2003). A hierarchical multivariable regression analysis will be performed. We expect that low Conscientiousness, low Agreeableness and increased internalized homonegativity will result in increased sensation seeking. The results of this study will help to clarify and delineate specific factors that may predict higher levels of sexual sensation seeking and risk-taking among MSM and have implications for treatment, future research and limitations.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The dawn of cardiovascular neuroprosthetics: Epidural spinal cord stimulation acutely restores cardiovascular function in persons with clinically complete spinal cord injury**

**Presenter: Sarafis, Zoe**

Neuroprosthetic electrical stimulation (ES) of the spinal cord has been shown to restore supraspinal control over dormant neuronal circuitry in spinal cord injury (SCI), by eliciting stepping-like movement of paralyzed skeletal muscles. Theoretically, similar principles may reestablish supraspinal control over the autonomic nervous system. Considering that autonomic and cardiovascular dysfunctions are primary causes of death post-SCI, and higher priority than walking, we aimed to explore if lumbosacral ES of the spinal cord can regulate the cardiovascular system post-SCI. Three cervical SCI individuals with severe orthostatic hypotension (decreased blood pressure (BP) when upright), impaired cardiac and cerebral regulation were implanted with a 16-electrode array paddle over the lower lumbar/sacral spinal cord segments, connected to an ES unit. Beat-by-beat BP, cardiac function and cerebral blood flow regulation were measured, in supine and sit-up positions, with and without cardiovascular-optimized stimulation. Targeted cardiovascular ES resulted in: [1] abrogated orthostatic hypotension (-39mmHg and severe presyncope vs. -8mmHg and absence of symptoms); [2] maintained stroke volume (blood volume pumped from the heart per beat) (-32ml vs. -8ml) and cerebral blood flow (-25cm/s vs. -6cm/s) during sit-up; [3] restored neurovascular coupling (+0% vs. 18%), indicating appropriate matching of cerebral blood flow to neural activity. We also observed increased low-frequency oscillations in systolic BP, suggesting that sympathetic control of BP from the brainstem is restored. Here, we provide first evidence that neuroprosthetic modulation of spinal cord circuitry below the injury restores normal autonomic control, which may represent a new age for management of autonomic and cardiovascular health.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Judgements of Truth and Verbal Deception by Canadian Adolescents: When is a Harsh Truth Okay?**

**Presenter: Shrestha, Claire**

Recent studies have found that Chinese youths judged collective-oriented lies in competitive contexts more positively compared to Canadian youths (e.g., Dmytro, Lo, Leary, Fu, Lee, & Cameron, 2014). The present study explored Canadian adolescents' classifications and judgements of deceptive or truthful statements that protect or expose either friends or compatriots in a sports-related context, to reveal collective (patriotic)/individualistic (friendship) values of the adolescents. Two hundred west-coast British Columbian high-school students were presented with moral dilemmas reflecting either patriotic or friendship contexts. Participants classified the statements of the story character as either a lie, the truth, or something else, and judged the statement's strength. There were no differences between the classifications of truths and lies between patriotic and friendship conditions, suggesting that Canadian adolescents defined a lie as a lie and a truth as the truth regardless of the context (although, the categorization of lies against friends provided a challenge for some youths). Additionally, there were no differences in judgments of lies between patriotic and friendship conditions. However, adolescents judged truths as less favorable ( $F(1,203) = 13.56, p < .001$ ), when they resulted in exposing a friend as a cheater than when judging a compatriot. This reflects the individualistic inclinations of these western Canadian adolescents, perceiving truths that expose a best friend as more morally unacceptable than those that expose a national collective. Applications of this study could include developing educational interventions that promote cultural tolerance in society, decreasing the likelihood of intercultural disagreements, and increasing group understandings and collaborations.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Assessment of infographics as a tool to promote healthy behavior**

**Presenter: Stroud-Drinkwater, Sasha**

I am investigating whether creating a module that makes scientific information more accessible to the public would result in changing people's mindset/behaviour. Specifically, I aim to inform the public about the fine particle air pollutant PM<sub>2.5</sub> and its health risks, to ultimately promote healthier behaviour. I am presenting evidence supporting the claims that we must act towards reducing PM<sub>2.5</sub> emissions, because it is considered to trigger lung and heart diseases, as well as cancer, which ultimately reduce life expectancy. Furthermore, it is not widely known that although the Greater Vancouver Regional District (GVRD) has relatively clean air, PM<sub>2.5</sub> remains a critical issue; there is no evidence that represents a safe level of exposure to it. In addition, the GVRD is growing quickly, and research shows that air pollution is a rising concern with urbanization; we must inform the public about what they can individually do to mitigate air pollution, as the road transportation sector and residential fuel wood combustion accounts for a significant amount of PM<sub>2.5</sub> emissions in BC. I will develop a module that will inform people about why/how we must act towards achieving this goal, by applying recognized best practices in teaching, as well as principles and theories of learning, which will be identified by reviewing literature. I will share the module on Facebook and assess the effectiveness of the module by asking volunteers to use the module and provide feedback regarding what they learned and how it may potentially change their mindset/behaviour, which I will then analyze.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: A grounded theory analysis of student perceived learning outcomes in an upper year biology course**

**Presenter: Sung, John**

University courses are designed to help students achieve specific learning objectives. However, not all students achieve these objectives. This is of particular concern in upper year courses that involve less rote memorization and place more emphasis on the application of critical skills, i.e., seek to develop skills in the upper levels of Bloom's taxonomy. It seems likely that a student's success is highly correlated with their understanding of the intended learning objectives. We have adopted a grounded theory approach of qualitative data analysis to examine student perceptions of knowledge and skills developed at specified stages in the course. Learning journals were prepared by the instructor and completed by students enrolled in an upper level developmental genetics course, over the course of 13 weeks. At four predetermined stages in the course, the students described the perceived skills that they had gained since the last time that they had completed a journal. Responses were analyzed for similar themes and compiled into overarching categories. These categories will be inspected for patterns and analyzed for potential discrepancies between expected and observed learning outcomes.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: The effect of temperature on the movement rate of green shore crabs, *Hemigrapsus oregonensis***

**Presenter: Uday, Prakruti; MacLellan, Abbey & Pattanshetti, Rutuja**

The objective of this study was to determine how temperature affects the movement rate of *Hemigrapsus oregonensis* collected from Tower Beach, Vancouver, British Columbia. *Hemigrapsus oregonensis* are ectotherms and water temperature plays an important role in regulating their body temperature. It is therefore important to understand how temperature variation in the organism's natural environment may either impair or enhance movement. We conducted two randomized controlled trials exposing *Hemigrapsus oregonensis* to either a 5°C or an 18°C water bath treatment. Crabs were randomly selected from a pre-treatment container and placed in one of two treatments. Video footage of each crab was uploaded to "Tracker" tracking software. Speed-time graphs for each replicate were generated and distance travelled by each crab was obtained by calculating the area under the curve. In trials 1 and 2, the mean distance travelled per minute by crabs tested in 18°C water was greater than the mean distance travelled per minute by the replicates tested in 5°C water by around 47 cm and 65 cm respectively. The difference between the distances travelled by crabs at 5°C and at 18°C in both trials was statistically significant. Increased movement may enable the organism to evade predators and catch prey, thus improving the organism's overall fitness and survival. We therefore concluded that short-term exposure to increased temperature increases movement of *Hemigrapsus oregonensis* collected from Tower Beach, which could help the organism to survive better in its natural environment.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Application of Nanoparticles in Cancer Treatments**

**Presenters: Yang, Amanda; Nouredine, Bayan; Patel, Ronil & Chai, Kalin**

“Drug delivery is the administration of a compound into the body to achieve desired effects.” There are a variety of drug delivery carriers, and each of them have specific advantages and disadvantages. Some examples include vesicles, micelles, liquid crystal, and various nanoparticles. This poster focuses on the application of nanoparticles targeting specific parts of the body. Nanoparticles are widely used as biomarkers for diagnosis. For instance, due to their special shapes and sensitivity to certain frequency of light, gold nanoparticles can be used as detectors to heart diseases, and various cancers. Another widely known application of nanoparticles is cancer treatment. This poster/presentation will focus on the efficiency of different nanoparticles on different parts of the body including the brain, lungs, breasts, and ovaries.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: : Evaluation of Sleep and Recognition Memory in the APP/PS1 Mouse Model of Alzheimer's Disease**

**Presenter: Yau, Kiana**

Alzheimer's disease (AD) is one of the most common neurodegenerative disorders in the elderly population, with over 46 million people worldwide living with the disease (Alzheimer's Disease International, 2015). Patients with AD experience disrupted sleep and impaired memory, conditions that can severely affect the quality of life of AD patients. Memory loss is one of the first symptoms reported by patients with AD (Jahn, 2013), and over 60% of AD patients report experiencing insomnia or other sleep disturbances (Guarnieri et al., 2012). Previous studies have pointed to plaques formed by the accumulation of misfolded amyloid-beta ( $A\beta$ ) as the primary cause of AD pathogenesis (Selkoe et al., 2016). To evaluate the effect of  $A\beta$  plaque accumulation on sleep and impaired memory, the APP/PS1 mouse model of AD (APP<sup>swe</sup>/PSEN1<sup>dE9</sup>), expressing the human APP transgene, was used. The APP/PS1 transgenic mouse model begins to develop plaque deposits at about six months of age, with levels accumulating by nine months of age. Mice received cranial implants of a modular EEG/EMG electrode grid for sleep pattern monitoring. To evaluate recognition memory, a novel object recognition test was performed. Results from these experiments will give us a better insight on the effects of  $A\beta$  plaque accumulation on sleep and impaired memory in AD, and support the development of novel therapeutic treatments.

# Friday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 8:00 am - 8:00 pm

**Title: Preservation of isobaric separation capabilities in Penning trap manipulations for large ion clouds**

**Presenters: Yu, Jenny; Li, Amy & Salhotra, Aviral**

Having precise measurements of particle properties is critical in the study of particle and nuclear physics. Studying these properties and behaviours allows us to form a more complete understanding of our universe. One device that enables precision measurements is the Penning trap, which functions by confining charged particles in an axial magnetic field and quadrupole electric field. The study of ion motion in a Penning trap allows for highly accurate analysis of various physical properties such as atomic decay of nuclides and atomic mass. Currently, particle motion in Penning traps is fully understood in single ion mode (i.e. when only one ion is present), but the introduction of enough ions to form a cloud leads to a highly complex n-body problem. In this work we seek to study the microscopic behaviour of large ion clouds in a Penning trap, and potential trap manipulations that can be performed on a cloud containing two or more isobars (atoms of different chemical elements that have the same number of nucleons). Specifically, we explored the feasibility of a technique called “dipole cleaning”, which is used to remove one species of the cloud while keeping the others undisturbed. Due to the complex nature of ion cloud motion and potential systematic constraints under experimental conditions, we utilized mainly Penning trap simulation software to generate datasets. We also report the technical challenges regarding the computationally intensive many-body simulations and our solutions. Relevant literature reviews were also performed to develop a deeper insight on theoretical context.

# Saturday Oral Presentation List

## 1:00 pm - 2:30 pm

### Henry Angus 234

#### **Addressing cardiac dysfunction in spinal cord injury**

Chau, Eric

#### **The use of alternative metabolic sources by microglia in the absence of glucose**

Kamyabi, Alireza

#### **Effects of prenatal alcohol exposure on neuroinflammation and neural activity in the prefrontal cortex**

Ng, Phoebe

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#### **Doramapimod and Methyl Jasmonate as Inhibitors of Neuroinflammation**

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#### **Effects of Active-Arm-Passive-Leg Exercise (AAPLE) on Acute Cardiorespiratory Responses in Individuals with High Thoracic SCI**

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#### **A test for the habitat-filtering hypothesis: Modelling avian population responses to land-use change in Guanacaste, Costa Rica**

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# Saturday Oral Presentation List

## 1:00 pm - 2:30 pm

Henry Angus 354

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Green, Katie

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**A spatial analysis perspective: Have mosquito net rollouts in Tanzania decreased malaria prevalence countrywide?**

Wang, Tracy

# Saturday Oral Presentation Abstracts

Henry Angus 234, 1:00 pm - 2:30 pm

**Title: Addressing cardiac dysfunction in spinal cord injury**

**Presenters: Chau, Eric**

Introduction: Cardiac dysfunction is a major consequence following spinal cord injury (SCI) that manifests from the interruption of beta-adrenergic stimulation to the heart due to the decentralization of descending sympatho-excitatory control. These outcomes are mediated by secondary injury mechanisms, through inflammatory pathways and the destruction of axonal-related structures. Minocycline, a tetracycline with anti-inflammatory properties, has previously demonstrated positive neuroprotective effects in these areas. By potentially attenuating the inflammation process, minocycline could lead to the remediation of cardiac abnormalities associated with SCI, such as impaired load-independent contractility and volumetric indices. Methods: At two months post-SCI, left ventricular (LV) pressure-volume catheterization with inferior vena cava occlusions and Dobutamine infusions were performed to examine load-independent and load-dependent measures of LV function in a T3 spinal contusion rat model. Results: Rats treated with minocycline showed significant improvements in measures of pressure and contractility (maximum pressure,  $P_{max}$ ; maximum rate of contraction,  $dP/dt_{max}$ ; end-systolic elastance,  $E_{es}$ ; preload-adjusted maximum rate of contraction,  $dP/dt_{max-EDV}$ ;  $p < 0.05$ ), with no meaningful changes in volumetric indices (cardiac output, CO; stroke volume, SV).  $P_{max}$  and  $dP/dt_{max}$  values in the vehicle group were normalized following the infusion of Dobutamine. Conclusion: Our findings provide further support to the notion that in the absence of changing volume conditions, disrupted beta-adrenergic control from descending sympatho-excitatory pathways is a driving force for cardiac contractile dysfunction in SCI. We demonstrate that minocycline normalizes ventricular contractility and pressure but volumetric indices remain largely diminished, which highlights the importance of venous return and LV volume loading.

# Saturday Oral Presentation Abstracts

Henry Angus 234, 1:00 pm - 2:30 pm

**Title: The use of alternative metabolic sources by microglia in the absence of glucose**

**Presenters: Kamyabi, Alireza**

Microglia are a class of cells in the central nervous system that are responsible for maintaining a healthy tissue microenvironment for neuronal survival and function. As the resident immune cells in the brain, microglia are uniquely mobile cells that constantly survey the brain tissue environment to respond to abnormalities and damage. The high mobility of microglia cells demands a constant supply of energy but as an essential class of protective cells in the brain, microglia need to be able to sustain their activity despite apparent shortage of energy sources. Previously, it has been shown that microglia cells are able to survive prolonged periods of time in the absence of glucose. The extent to which microglia utilize alternative energy sources and how they are able to maintain their function in the absence of glucose remains unclear. Here, we investigate whether microglia cells rely on the use of glutamine as a viable alternative energy source in the absence of glucose. Using in-vitro studies on primary mouse microglia cells, we show that these cells are able to use glutamine in the absence of glucose to maintain their metabolic activity and vital defensive functions. Microglia cells, in-vitro, can maintain their phagocytic function using only glutamine as metabolic fuel. To conclude, our findings provide evidence for the use of glutamine as an alternative energy source for microglia and open the way to questions regarding how this important class of immune cells in the brain are able to use glutamine to sustain their function in the absence of glucose.

# Saturday Oral Presentation Abstracts

Henry Angus 234, 1:00 pm - 2:30 pm

**Title: Effects of prenatal alcohol exposure on neuroinflammation and neural activity in the prefrontal cortex**

**Presenter: Ng, Phoebe**

Prenatal alcohol exposure (PAE) can result in a range of deleterious effects on offspring, including increased rates of mental health problems. In addition, individuals with Fetal Alcohol Spectrum Disorder (FASD) have been observed to have impaired immune function, and, in animal models, ethanol increases microglia (a key immune cell in the brain) activation and inflammation. Increased inflammatory responses in the prefrontal cortex (PFC) have been shown to be linked to the disease course of depression, and there is increasing evidence that hyperactive inflammatory responses could underlie the development of depressive disorders. However, little research has been done to examine the connection between inflammation caused by PAE and depression. We used a rat model to better characterise this potential link. Pregnant Sprague-Dawley rats were randomly assigned to one of three diets: PAE - unrestricted access to a liquid ethanol diet - 36% EtOH-derived calories; pair-fed (PF) - liquid control diet, with maltose-dextrin as an isocaloric substitute for EtOH; or control (C) - unrestricted access to pelleted control diet. Next, inflammatory responses were examined in the PFC of the offspring by measuring microglial activation levels, and neural activity. We hypothesized that PAE would increase microglia activation, and that this would correspond to altered PFC activity patterns. Our findings will allow for a better understanding of PAE's effects and its link to neurological disorders such as depression through the inflammatory response. This could help better inform clinicians advising those with FASD and illuminate a new approach for the treatment of depression.

# Saturday Oral Presentation Abstracts

Henry Angus 234, 1:00 pm - 2:30 pm

**Title: 70s Feminism at UBC: Lived Experience, Administrative Resistance, and Institutionalized Advice**

**Presenter: Toor, Amrit**

This thesis examines Ubyyssey articles, alongside local feminist writings and government-published sources, to explore the topic of sexual assault at UBC throughout the 1970s. Sexual assault at Canadian universities has rarely been analyzed by historians, but it has long been recognized as a rich subfield within American scholarship. Throughout the Long Sixties (1960-1980), universities across North America served as a breeding ground for different forms of second-wave feminism, as young, female activists became increasingly frustrated with a lack of adequate support systems. Ranging in scope from increased interest in sexual freedoms and women's rights to the deconstruction of on-campus sexual assault, these feminists began to work against the socio-political foundations of sexism across the continent.

At UBC this was particularly clear, as student journalists and local feminist organizations worked together to educate the student body and the administration about the prevalence of sexual violence on-campus. In order to fully understand these conflicts and the connections to broader feminist struggles during the Long Sixties, this thesis examines three main themes. First, there is an examination of the growing demand by student feminists and the administration for personal accounts of sexual assault, in order to demonstrate the pervasiveness of sexism on-campus. Second, this thesis will examine the construction of advice for female students, and the ways in which this reflects broader misunderstandings about sexual assault. Finally, it will analyze the campus-based dynamics involved in the creation of institutional support, and the ways in which this differs from dynamics present within high politics.

# Saturday Oral Presentation Abstracts

Henry Angus 235, 1:00 pm - 2:30 pm

**Title: Modelling Diffusion in a Physically Constrained System: A Numerical Approach**

**Presenters: Li, Jim & Jozefiak, Adam**

Diffusion has been described on a microscopic scale by Einstein as a probabilistic collision of particles. On a macroscale, diffusion has been thoroughly described by Fick's laws. However, the solutions to Fick's laws are limited to idealized 3-dimensional systems with no barriers to diffusion. The aim of this experimental study is to provide a mathematical model for diffusion which incorporates both macroscopic and microscopic properties to effectively model diffusion in a geometrically constrained two-dimensional system. Based on macroscopic and microscopic properties, two-dimensional diffusion was modelled as a summation of equally probable paths of diffusion. The point source diffusion of hydrochloric acid in an arena with variable barrier dimensions was monitored continuously using a pH probe with multiple replications. The numerical solution of the mathematical model for each experimental condition was determined and the pre-exponential factor was fit to the measurements. The average pre-exponential value was determined for each experimental condition, and t-scores were calculated to compare the average pre-exponential values which were found to be statistically similar. This indicates that the proposed model is an accurate model as it predicts identical pre-exponential values between experimental conditions, accounting for all variants that it attempts to model. This model provides a bridge between the microscopic and macroscopic theoretical descriptions of diffusion that were independently postulated by Einstein and Fick. Applications of the model include approximating the location of leakage in a hydraulic system based on the macroscopic effects detected at another location, given knowledge of the system's boundaries and internal compartmentalization.

# Saturday Oral Presentation Abstracts

Henry Angus 235, 1:00 pm - 2:30 pm

**Title: The Future of Communication: A Look At Authorial Tags on Internet Archive Sites**

**Presenter: Li, Audrey**

It is with language that human beings create and define our reality. While it is common knowledge that speech and writing are methods for communication, authorial tags may also offer new insight into the ongoing evolution of language use. Website users isolate key terms (tags) from their content and use these as labels to archive their work with others of similar topics. Content creators, primarily on sites archiving works of fiction, have developed these tags into a secondary, less formal method of communication with their audience. Taking a curatorial view, this study looks at select authorial tags in light of their developing role beyond the boundaries of curation, to show the interrelatedness of online sociolinguistics. Drawing on past research in the cognitive sciences describing principles of representation, grounding, and pragmatics, I analyzed the authorial tags of a work posted on a fiction archive site for similarities in language to the dialects of other websites. I identified many instances of cross-referencing, along with a colloquial style of language unusual in ordinary tags. Considering the mechanics of human communication and the Internet, these findings indicate a shift in the use of tags. No longer solely a tool of curation, many tags are beginning to adopt an informal nature that require the user to identify the context from which individual words and phrases come, in order to appreciate the full nuances of the transmitted message. Recognizing this change opens up new avenues for exploration in future studies of curation and linguistics.

# Saturday Oral Presentation Abstracts

Henry Angus 235, 1:00 pm - 2:30 pm

**Title: Doramapimod and Methyl Jasmonate as Inhibitors of Neuroinflammation**

**Presenter: McKenzie, Jordan**

Alzheimer's disease (AD), the most common cause of dementia, is a neurological disorder associated with neuronal death and cognitive deficits. Currently, there is no disease modifying treatment for AD. Inflammatory mechanisms contributing to AD pathogenesis result from upregulated immune cell response to pathological insoluble beta-amyloid ( $A\beta$ ) protein deposits and neurofibrillary tangles, which are hallmarks of AD. Microglia are the resident immune cells of the brain and have been found to phagocytize and degrade toxic deposits of  $A\beta_{42}$ , which is generally beneficial for maintaining brain homeostasis when properly cleaved at  $A\beta_{40}$ . However, in the diseased brain, the dysregulated activation of microglia may lead to chronic neuroinflammation characterized by an enhanced microglial secretion of inflammatory mediators, such as cytokines and chemokines as well as reactive oxygen and nitrogen species, which leads to neural cell death at concentrations above physiological. This study explored the biological effects of a p38 mitogen-activated protein kinase (MAPK) inhibitor doramapimod, developed to treat rheumatoid arthritis, and a natural antioxidant, methyl jasmonate, in an in vitro model of neuroinflammation. These compounds have previously shown neuroprotective effects but have yet to be tested specifically for their potential as a treatment of AD. This study determined the efficacy of the two compounds in altering the phagocytic activity and secretory profile of in vitro microglia, which are key inflammatory processes contributing to the pathogenesis of AD. Determining if doramapimod or methyl jasmonate reduces toxic microglial secretions is the first step in the development of these drug candidates that may one day lead to a clinically effective treatment of the neuroinflammation seen in AD.

# Saturday Oral Presentation Abstracts

Henry Angus 235, 1:00 pm - 2:30 pm

## **Title: Functional Change in Airway Smooth Muscle Associated with Knockdown of Smoothelin**

**Presenter: Mysuria, Shivani**

*Background:* Smoothelin is a cytoskeletal protein found exclusively in smooth muscle cells and has been shown to be over-expressed smooth muscle following fatal asthmatic attacks. Knockout mice models for intestinal and vascular smoothelin have demonstrated a significant decrease in the ability to contract and generate force. Using small interfering RNA (siRNA), molecules that prevent smoothelin from being made, we aim to demonstrate the functional change in airway smooth muscle associated with smoothelin deficiency, specifically addressing how smoothelin affects contractility.

*Hypothesis:* Knockdown of smoothelin in airway smooth muscle will decrease the muscle's ability to contract and generate force.

*Methods:* Airway smooth muscle strips of approximately 5 mm length were harvested from sheep trachea and subjected to periodic electric field stimulations (EFS) to measure baseline, followed by incubation in smoothelin siRNA, scrambled RNA control, or media only control for 5, 24, and 48 hours. Mechanical measurements were taken again, the tissues were frozen for RNA isolation.

*Preliminary Results:* All siRNA treatment showed a decrease in force generation, whereas all the scrambled RNA showed similar amounts of force compared to untreated samples (n=3). Quantitative polymerase chain reaction (qPCR) that measures amplified amounts of our nucleic acid of interest, following 5 hr treatment with anti-Smoothelin siRNA demonstrated a 30% knockdown of smoothelin mRNA, 24 hr demonstrated a 60% knockdown, and 48 hr showed 95% knockdown. *Conclusions:* The results indicate that siRNA transfection is an efficient way of knocking down smoothelin, and that knockdown of smoothelin indeed decreases smooth muscle contractility. Findings from this research can be applied to find alternative therapies for airway disorders.

# Saturday Oral Presentation Abstracts

Henry Angus 237, 1:00 pm - 2:30 pm

**Title: X-Ray Fluorescence Analysis on Ceramics from Bahrain**

**Presenter: Betz, Emma**

X-Ray Fluorescence analysis was performed on four ceramic vessels from Bahrain that come from the Blackmore Collection from the Laboratory of Archaeology at the Museum of Anthropology. Stylistic comparison has been done to determine if these ceramics were produced in Bahrain since the vast majority are undocumented. X-Ray Fluorescence was used to determine which elements are present in the fabric and glazes of the ceramics and indicate elements that are characteristic of Bahraini clays. The results showed some definite distinctions and could serve as a reference for future studies of this collection. The study could ultimately help to better understand trade routes and areas of production for the island and is the first comparative study done for Bahrain ceramics dating to the Tylos Period.

# Saturday Oral Presentation Abstracts

Henry Angus 237, 1:00 pm - 2:30 pm

**Title: The Role of Insulin in Alzheimer's Disease**

**Presenter: Bhanji, Azra**

The definite cause of Alzheimer's Disease (AD) is still unknown, but one hypothesis claims that AD, also known as Type 3 Diabetes, is due to insulin resistance and deficiency in the brain. In post mortem brains of advanced AD, it was found that there was significantly lower insulin than in controls. Whether this insulin is produced in the brain or comes from peripheral sources is unknown, and hence this study aims to approach this problem by beginning to identify the location of insulin in the brain. Mice with differing amounts of expression of INS2 gene were sacrificed, and their brains and pancreas sectioned, stained and compared under both the wide field and confocal fluorescent microscopes. Special attention was devoted to the choroid plexus and the hippocampus, as these regions have a high insulin receptor density. Currently, we are focusing on refining our methodology to confidently identify insulin in these brain regions. Through the correct detection of insulin in the brain, future research aims to identify the cells responsible for its production and to recognize the role of these cells in AD.

# Saturday Oral Presentation Abstracts

Henry Angus 237, 1:00 pm - 2:30 pm

**Title: The grounding for shared representation of code language in an authoritarian state**

**Presenter: Chan, Candice**

It is no secret authoritarian states have an overwhelming control over media outlets so as to maintain political stability. Surprisingly, Chinese internet users (netizens) are still able to sustain conversations, about politically taboo topics, with the use of seemingly irrelevant words to gloss over political discussion and use vulgar language to hide away from the spying eyes of online security. By using seemingly mundane words, netizens (in this context citizen network users who wish to participate in politics without legal consequences) develop their own code languages and are able to get away from an accusation of criticizing the party and certain political figures. The question then becomes what contributed to the successful usage of this code language when the language is very implicit? Current theories in cognitive science suggest that communication depends on how a text is represented, and the process of building a common ground, grounding, in a conversation. This study employed concepts of grounding to explore the shared representation among netizens in focusing, constraining, and structuring the conversation. By comparing the difference in nature of three specific examples that reflect the use of code language for political discussion and the banned use of vulgar language, this paper evaluated the grounding between netizens and utilization of daily objects that are referenced as 'cognitive artifacts' to facilitate understanding. Understanding this will guide research on political discourse in authoritarian regimes.

# Saturday Oral Presentation Abstracts

Henry Angus, 237 1:00 pm - 2:30 pm

**Title: Possessed: The Effects of Self-Relevance on Attentional Rubbernecking**

**Presenter: Ptak, Emilie**

Attentional rubbernecking occurs when salient stimuli capture attention, leading to difficulty disengaging and attending to other stimuli. Previous research found that we attend more to objects we own since they are self-relevant. Self-relevance refers to an item belonging to oneself, while other-relevant refers to an item belonging to someone else. We hypothesize that self-relevant stimuli will induce attentional rubbernecking. Participants memorized arbitrarily assigned ownership statuses, that is self-relevant or other relevant, of 24 objects. Participants were then presented with streams of photos in which items appeared in rapid succession. In each stream, one self-relevant or other-relevant item was highlighted and was followed later in the stream by a house flipped either left or right. Participants were asked to identify the highlighted item and house orientation. Accuracy reporting house orientation following correct highlighted item identification was measured. Participants accurately determine house orientation 70 percent of the time if the house appears two items after the highlighted item, compared to a 92 percent accuracy the house appears eight items after the highlighted item. More importantly, participants are less accurate determining house orientation in self-relevant streams. Attentional rubbernecking suggests this is because self-relevant items are distracting and capture more attention than other-relevant items. Disengaging from self-relevant items, and subsequently attending to other items, becomes more difficult. Findings have implications for what contributes to attentional biases. Examples include why one is more distracted by their own phone ringing while studying but less distracted by other students' phones.

# Saturday Oral Presentation Abstracts

Henry Angus 237, 1:00 pm - 2:30 pm

**Title: Incidence and natural progression of neurogenic shock following traumatic spinal cord injury**

**Presenter: Ruiz, Ian**

Damage to the nervous system, as occurs after spinal cord injury (SCI), alters the function of the heart and blood vessels, manifesting in a variety of conditions. One such condition, neurogenic shock, results in profoundly low heart rate and blood pressure, which complicates clinical management and impacts motor and sensory recovery. Moreover, as the reported incidence of this condition varies significantly, we aimed to establish the true incidence of neurogenic shock by comparing the most commonly used clinical definitions. Further, we characterize the recovery of neurogenic shock as clinical progression is poorly understood. Daily blood pressure, heart rate, fluid management, pharmacologic intervention, and motor and sensory status were collected over the course of 30 days from 84 adults after they were admitted to our hospital following upper (cervical; n=56) and lower (thoracic; n=28) SCI. We found that the clinical definition used greatly influenced the reported incidence rate. Using a novel set of criteria to define neurogenic shock, the incidence (29% cervical SCI) in our sample most appropriately reflected prior literature and our clinical expertise, identifying blood loss as a primary factor responsible for the inconsistencies between studies. Additionally, we found: (1) a characteristic decline in blood pressure one-week post-injury, and (2) that fluid management is not currently an integral aspect of clinical management (all individuals were managed at a net fluid intake < zero). The results demonstrate the need for accurate identification of neurogenic shock, which matters clinically and epidemiologically to responsibly allocate resources to its management.

# Saturday Oral Presentation Abstracts

Henry Angus 243, 1:00 pm - 2:30 pm

**Title: Drones in the DRC: A Case Study for Future Deployment in United Nations Peacekeeping**

**Presenter: Andrews, Morrell**

Unmanned aerial vehicles (UAVs), commonly known as drones, are often associated with the American War on Terror in the Middle East due to their extensive use for armed strikes and intelligence gathering. It is well known that UAVs have seen deployment in Pakistan, Iraq, Israel, and Afghanistan, however few are aware that drones have played an integral role in the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO) since 2013. This research seeks to empirically explore the implications of UAV use through past deployment trends in the DRC and public perception studies by examining issues related to data use, mandated use of force, costs, as well as the blurring of offensive and humanitarian action. By using MONUSCO as a case study to examine the successes and pitfalls associated with its use of drones, this research concludes that though the technology provides significant benefits there are major obstacles for scaled-up use of drones in other UN missions. Ultimately, costs, missions that are less politically palatable, optics, and reputational risk are major challenges for the UN to consider in order to ensure fully executed mandates and successful missions where drones are involved in the future.

# Saturday Oral Presentation Abstracts

Henry Angus 243, 1:00 pm - 2:30 pm

**Title: Statins can reduce the risk of depression and anxiety in patients with coronary heart disease**

**Presenters: Asim, Aayza ; Sara, Raman & Lim, Ulim**

Statins are a class of lipid lowering medications that prevent the body from making cholesterol. They are generally used to reduce coronary heart disease. They are also known to decrease the mortality rate of those patients that are in high risk of heart disease. In this research project, we will investigate the use of statins to treat depression and anxiety in individuals with coronary heart disease (CHD). Because depression is the clinical expression of inflammation and induction of oxidative stress, there is a great interest in the potential use of statins to reduce the risk of depression. Anxiety is known as a mental illness that can cause feelings of restlessness, adrenaline, and increased heart rate. As anxiety does affect the heart, there is interest in how statins could affect the overall well-being of a person with anxiety. 752 Canadian patients aged 18 and above, with heart disease, were tested for depression and anxiety. The 536 patients that did not test positive for depression and anxiety were divided into two groups. 412 participants belonged to the first group that used statins and 124 belonged to the second group that did not use statins. The participants in both the statin use and control groups were followed and examined for six years. Out of the controlled group, 28% of the participants developed depression and/or anxiety, but out of the statin using group, only 18% of the participants developed depression and/or anxiety. We conclude that use of statins can lower the risk of depression and anxiety in patients with coronary heart disease.

# Saturday Oral Presentation Abstracts

Henry Angus 243, 1:00 pm - 2:30 pm

**Title: Genetic Correlates of Chemosensory Deficits in Alzheimer's and Parkinson's Disease in *C. elegans***

**Presenter: Born, Dawson**

Parkinson's Disease (PD) and Alzheimer's disease (AD) together affect more than 50 million people worldwide. Clinical symptoms such as memory loss in AD and tremors in PD are well known to the general public. However, deficits in olfaction (the sense of smell) are one of the earliest symptoms to appear in both AD and PD. Mutations in the human presenilin genes (PSEN1 and PSEN2) have been implicated in AD, and mutations in LRRK1/2, VPS35, and DNAJC13 have been implicated in PD. However, little is known about the genetic correlates of the observed olfactory deficits in AD and PD patients. Using the nematode worm *Caenorhabditis elegans*, we investigated the effect of targeted gene mutations on the worms' ability to respond to odourants. We previously showed that a mutation in *sel-12*, the *C. elegans* equivalent of PSEN1, results in worms with an impaired ability to smell. In this study we show that introducing wild-type human PSEN1 was able to reverse this deficit. Also, we show that mutations in *lrrk-1*, *vps-35*, and *rme-8* (*C. elegans* equivalents of LRRK1, VPS35, and DNAJC13, respectively) show a similar inability to smell. Future experiments will investigate the underlying mechanisms of the relationship between AD/PD-related genes and olfactory deficits.

# Saturday Oral Presentation Abstracts

Henry Angus 243, 1:00 pm - 2:30 pm

**Title: Developing a model for Silver-Russel Syndrome: Analysis of imprinted regulation at the mouse Cpa4 gene**

**Presenter: Gohari, Amir**

Development of laboratory models is an essential step in studying human disorders. The Silver-Russell Syndrome (SRS) is one of these disorders that is characterized by poor postnatal growth and distinctive craniofacial features. Instead of receiving a copy of chromosome 7 from each parent, some SRS patients inherit two copies from their mother, leading to the overexpression of genes that are normally maternally expressed (imprinted genes). We propose that the overexpression of the maternally expressed Carboxypeptidase A4 (CPA4) gene, which has potential roles in cell proliferation/differentiation, is a strong candidate for SRS. My study aims to perform the initial characterization of Cpa4 expression in the mouse with the long-term goal of developing a SRS model. To evaluate whether the expression of mouse's Cpa4 gene resembles the patterns reported for humans, embryonic and postnatal tissues of progenies of reciprocally crossed mice were dissected for analysis. Although the initial sequencing results suggest that the Cpa4 expression in the mouse does not resemble human's imprinted pattern, the early characterization of Cpa4 expression is important as it disrupts the earlier assumption that the mouse gene cluster of interest closely resembles the human gene cluster. Additionally, to address the question of how Cpa4 expression is regulated, I established the initial steps for a complete embryonic stem cell model study. In the next phase of the project, the promoter of Cpa4 can be targeted using the CRISPR method, allowing us to study the mechanism behind the expression regulation of this gene region.

# Saturday Oral Presentation Abstracts

Henry Angus 243, 1:00 pm - 2:30 pm

**Title: Manual water changes temporarily alter the social behavior of zebrafish housed in enriched tanks**

**Presenter: Powell, Christine**

Fish have recently become the most used animal in scientific research across Canada, with zebrafish the most used species. The current scientific consensus is that fish have the capacity to suffer, emphasizing the importance of fish welfare research as a means to improve the quality of their lives and ensure their validity as reliable, scientific models. Environmental enrichment can increase fish welfare, but it may come with unintended welfare costs: enriched aquatic environments require intensive husbandry procedures (e.g. manual water changes) that could elevate stress. Previous research with zebrafish has examined husbandry procedures in non-enriched environments and has focused on physiological indicators of health; no research has yet investigated social behavior, which for a highly social species such as zebrafish, can be a sensitive indicator of welfare. We predicted that the social behavior of zebrafish would be negatively impacted by manual water changes. We tested our prediction by measuring the social behavior—aggression, group cohesion, and social coordination—of zebrafish the day before, the day of, and the day after a weekly, manual water change. Similar to what has been found in other species (e.g. mice), we found that cleaning elevated aggression throughout the day of the water change but that behaviour had returned to baseline levels two days following the water change. We also found that cleaning decreased cohesion and coordination, but only on the day of cleaning while the technicians were still in the room. These results indicate that manual water changes could be temporarily distressing for zebrafish.

# Saturday Oral Presentation Abstracts

Henry Angus 334, 1:00 pm - 2:30 pm

**Title: Discovering a New Sunflower**

**Presenter: Borkowski, Kelly**

The common sunflower (*Helianthus annuus* L.) is part of the most diverse flowering plant family, Compositae, and one of the world's most important oilseed crops. As a result of domestication, sunflower's genetic diversity has decreased and it is more vulnerable to plant diseases thus risking its eradication. Variation in oil and fatty acid content within their wild crop relatives (WCR) acts as a source of novel traits. WCR genes are socio-economically important for producing crops with high yields that are also tolerant to biotic and abiotic stress. New species are rare and valuable to the collection of WCR endosperms for gene preservation. One seed collection of Rieseberg lab contains five wild sunflower populations of *H. niveus* collected from remote areas of northern Mexico. To determine if two of the collected populations are putative new subspecies, I conducted a common garden experiment. The three known *H. niveus* subspecies were grown together with the two potentially new subspecies and phenotyped for 25 morphological traits. In addition, crosses were done between the populations to determine if the two potential neospecies were reproductively isolated from the known subspecies of *H. niveus*, and from each other. Comparison of morphological traits will bring us closer to determining the taxonomic relationship of the investigated populations. DNA sequencing of each may reveal the basis of their phenotypes and may support their speciation. Advantageous traits discovered in the putative neospecies can be utilized in breeding programs to improve agricultural production and maintenance of agro-ecosystems.

# Saturday Oral Presentation Abstracts

Henry Angus 334, 1:00 pm - 2:30 pm

**Title: Effects of Active-Arm-Passive-Leg Exercise (AAPLE) on Acute Cardiorespiratory Responses in Individuals with High Thoracic SCI**

**Presenter: Eginyan, Gevorg**

86,000 Canadians living with spinal cord injury (SCI) are subjected to a number of physical, social and environmental barriers that compound paralysis and limit their daily physical activity. Consequently, the prevalence of cardiovascular disease (CVD), due to inactivity associated cardiac dysfunction, is significantly increased in this population (Krassioukov et al., 2013). Exercise is an obvious method by which the cardiovascular decline associated with SCI can be offset. Taken together the current basic science data (West et al., 2014) and preliminary evidence in humans with SCI (West et al., 2015) led us to hypothesize that Active-Arm-Passive-Leg Exercise (AAPLE) would exert superior cardiovascular benefits than upper-limb exercise alone in individuals with SCI. Therefore, the aim of this study was to systematically examine and compare the acute cardiorespiratory responses between upper-body exercise and AAPLE in individuals with chronic traumatic motor-complete SCI.

# Saturday Oral Presentation Abstracts

Henry Angus 334, 1:00 pm - 2:30 pm

## **Title: The Effects of Prenatal SSRI Exposure on Hippocampal Myelination and Working Memory in Infants**

**Presenters: Miflores, Stephanie; Trac, Chanel; Kustario, Viola & Khosla, Kanika**

Antenatal maternal depression occurs among 12% of women and is most commonly treated using selective serotonin reuptake inhibitor (SSRI) antidepressants. SSRIs cross the placenta and may influence fetal brain development; however, the potential influences on fetal development warrant further research. This study will investigate the effects of prenatal SSRI exposure on hippocampal myelination and working memory (WM) in 3- and 8-month-old infants. Prenatal SSRI exposure may affect the neonatal hippocampus and its serotonin transporter (5-HTT), an important factor for myelination during early brain development. As past studies have indicated that hippocampal myelination is critical for early WM, we predict that prenatal SSRI exposure will impair hippocampal myelination, resulting in impaired infant WM in both 3- and 8- months old infants. We will study SSRI-exposed infants and 2 control groups of non-exposed infants with either depressed or nondepressed mothers, to account for subsequent exposure to maternal depression. Myelination in the hippocampus will be measured both at 3- and 8-months of age using diffusion tensor imaging (DTI), providing a measure of white matter myelination. For the same infants at both time-points, an eye tracker test will measure WM through habituation and dishabituation to different coloured objects. Habituation will provide information on cognitive development and formation of WM among subjects. We expect these results to indicate that prenatal SSRI exposure is negatively associated with hippocampal myelination and WM in infants from impairment of neural impulse transmission. These findings may suggest potential consequences that should be accounted for when prescribing SSRIs to expectant mothers.

# Saturday Oral Presentation Abstracts

Henry Angus 334, 1:00 pm - 2:30 pm

**Title: Shifting Landscapes: Community and Care in Vancouver's Chinatown**

**Presenter: Ng, Kacey**

The landscape is ever shifting in Vancouver's Chinatown as gentrification is continuously encroaching on a historically low-income neighbourhood. (Anderson, 2014) As housing prices rise and new commercial real estate is introduced, there is a slow process of degradation of the built and social environment that comprises this historic neighbourhood. I will be analyzing the evolution of signage within Vancouver's Chinatown as an indicator space and place, using them as indicators of collective identity. With its continued destruction, there is a need to rebuild the sense of community that had previously found home in Chinatown. This paper provides an example of the promotion and the celebration of cultural and generational diversity, and a means for which to use skills acquired at an institute of higher learning and apply them for further community empowerment. Within this paper, I focus primarily on the elders of Chinatown and the barriers they face. Language barriers often prevent non-English speaking elders from accessing government-provided services to their fullest extent. This paper argues that the evolution of street signage has created a crisis on the composure of collective identity. One project that is highlighted through this process is the development of "Project You", a youth led initiative, which provides an in depth, focus on multigenerational community building.

# Saturday Oral Presentation Abstracts

Henry Angus 334, 1:00 pm - 2:30 pm

**Title: Why we wait until the last minute: Economic explanations of procrastination**

**Presenter: Wu, Fanny**

Studies show that up to 95 percent of college students procrastinate, which greatly affects their performance in their daily lives. George Akerlof sought to explain this phenomenon through the cognitive psychology concept of undue salience: our inclination to be affected by novel, vivid, and seemingly more relevant information (e.g., having dinner with friends, rather than writing a paper). Although his model explains why people procrastinate during decision-making processes, it fails to explain why people react differently across circumstances. My objective is to test the applicability of Akerlof's salience model to university students' study life and to thereby gain insight into human decision-making behaviour. The model from Akerlof, alongside other research involving time inconsistent behaviour under perfect information, will be reviewed. Based on the examination of expected utility, cost, and benefit functions of different models in students' daily tasks, I contend that the procrastination model offered by Akerlof is oversimplified, and that some of his assumptions cannot be justified. I claim that a different economic model should be used when considering different factors, e.g., personal preference, duration, and the difficulty level of the task.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: The Impact of Manure Type, Temperature and Moisture Content on the Dynamics of Total Nitrogen, Phosphorus, and Plant-Available Nitrogen**

**Presenter: Bertoni, Nic**

With livestock populations in the world rapidly growing in the last 50 years, organic wastes have increasingly become the center of scientific attention. Utilization and management of livestock manure is increasing in order to reduce the use of synthetic fertilizers. An incubation study was performed to quantify nitrogen (N) and its plant-available forms (NO<sub>3</sub><sup>-</sup> and NH<sub>4</sub><sup>+</sup>), as well as phosphorus (P), in raw manures (horse and chicken). For each manure, two temperatures (4°C and 20°C) and moisture contents (60% and 140%) were studied during a 13-week incubation to determine their impact on manure mineralization, which is the conversion of organic nutrient forms into inorganic plant-available forms. Percent N and P were measured through Fourier-Transform Infrared Spectroscopy (FTIR) four times (every three weeks) throughout the incubation period while available N was measured with 2 M potassium chloride extractions six times (on a biweekly basis). Concentrations of total N and P and available nitrogen were higher in chicken as compared to horse manure. Manure %N was highest when temperatures and moisture content were both high, %P and NO<sub>3</sub><sup>-</sup> were highest with high temperature combined with low moisture, and ammonium was highest with low temperature combined with high moisture. Overall, this study highlighted that chicken manure had the highest nutrient content of the manures tested, and thus the greatest fertilization value for food production.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: A test for the habitat-filtering hypothesis: Modelling avian population responses to land-use change in Guanacaste, Costa Rica**

**Presenter: Ou, William**

Land-use change has become the hallmark of human existence. With increasing global food demands, natural landscapes will likely continue to be converted into agricultural land in the coming centuries. Land-use change not only alters landscapes, but also alters associated abiotic conditions. The habitat-filtering hypothesis states that ecological filters select for individual species that have traits suitable for their environment. In light of this, will certain species respond positively while others negatively to changing environmental conditions as a result of land-use change? This study will test the question by examining the population responses of two focal species of birds, *Thryophilus pleurostictus* and *Volatinia jacarina* to varying degrees of biotic and abiotic factors. More specifically, this study will examine how each species' detection probability varies with local land-use type, surrounding forest cover, precipitation, and insect biomass. A total of 20 sites were surveyed in Guanacaste, Costa Rica. Avian point counts were conducted by a single highly-qualified ornithologist to determine the detection probability of our two focal species in the summer of 2016. Forest cover was determined by using satellite images. Precipitation data was acquired from the Instituto Meteorológico de Costa Rica. Pitfall traps were deployed to determine relative insect biomass between sites. Lastly, local land-use type was classified as either forest or agriculture. A generalized linear mixed model (GLMM) was utilized to model the population responses to the four predictors. The results indicate that the two species show differential population responses to local land-use, surrounding forest cover, precipitation and insect biomass thereby supporting the habitat-filtering hypothesis.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: Adaptation to environmental stress via the transcriptional coregulator MDT-15**

**Presenter: Poon, Amy**

Early development of an organism may be impaired by environmental and nutritional stresses. Specific gene expression programs are activated by transcription factors and coregulators to adapt to chemical or dietary stresses and to protect against damage by detoxifying the stressor. MDT-15 is a transcriptional coregulator that coordinates protective gene programs in response to multiple stressors, including environmental contaminants (organic carcinogens, heavy metals), dietary changes (vitamin B12 deficiency) and temperature changes. We hypothesized that environmental stresses would cause an increase in MDT-15 protein abundance as an adaptive response to aforementioned stresses (feedback regulation).

Experiments were carried out in the powerful model organism *Caenorhabditis elegans* (a nematode worm), in which MDT-15 and its regulatory pathways are conserved. We exposed the worms to an organic carcinogen/heavy metal (vs. solvent), a vitamin B12 deficient diet (vs. standard laboratory diet), or different temperatures (vs. growth at standard 20°C). As preliminary data shows no alternation of *mdt-15* transcription by stress, Western blots were performed to compare MDT-15 protein levels in all conditions. We found that MDT-15 protein abundance was increased substantially in several conditions where *mdt-15* is required for adaptive responses.

NHR-33 is a transcription factor required for induction of zinc and cadmium (heavy metal) responsive genes. To know whether MDT-15 regulates zinc and cadmium stress response through NHR-33, yeast two-hybrid assays were performed to examine the physical interaction of MDT-15 with NHR-33 at specific binding sites. Collectively, this project has provided new insights into the interplay between metabolic gene expression and changing environmental conditions.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: Functional characterization of Integrin  $\alpha 6$  (CD49f) isoforms in triple negative breast cancer cells**

**Presenter: Vieira, Heidi**

Integrin  $\alpha 6$  (CD49f) is a surface receptor protein with roles in cell signalling and adhesion. Increased  $\alpha 6$  expression in breast cancer cells has been associated with rapid disease progression and reduced survival. This integrin has two splice isoforms,  $\alpha 6A$  and  $\alpha 6B$ , which differ in the length and composition of their cytoplasmic tails. As the cytoplasmic domains determine the specificity of integrin-mediated signaling, we hypothesized that the two  $\alpha 6$  isoforms may have distinct roles in breast cancer cell tumorigenicity. To examine whether tumorigenic potential is correlated with differential  $\alpha 6$  isoform expression, we profiled tumoursphere-forming efficiency across a panel of 12 breast cancer cell lines and compared it to their  $\alpha 6A$  and  $\alpha 6B$  expression. We found a correlation between increased tumoursphere-forming ability and high integrin  $\alpha 6B$  expression, suggesting a correlation between  $\alpha 6B$  and the tumorigenic phenotype. Furthermore, the stem-like population of cells harvested from the tumourspheres had upregulated  $\alpha 6B$  isoform levels compared to cells maintained in standard culture. These findings are suggestive of a cytoplasmic tail-specific role of the integrin  $\alpha 6$  isoforms in tumorigenicity. Further work is ongoing to explore isoform-specific changes in tumourigenesis through CRISPR-Cas9 silencing of the integrin  $\alpha 6$  gene, and the selective re-expression of  $\alpha 6A$  or  $\alpha 6B$  isoforms in these knockout cells. Characterizing the role of integrin  $\alpha 6$  isoforms in tumourigenesis will lead to an advance in the understanding of their functional roles across breast tumour subtypes and intratumour cell subpopulations, offering potential drug targets for breast cancer treatment.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: A New Perspective: An examination of Senator Elizabeth Warren's statements to Wells Fargo CEO John Stumpf using a post-foundational approach to critical discourse analysis.**

**Presenter: Whittemore, Joey**

On September 8th, 2016, US regulators fined Wells Fargo for creating 2 million fake customer accounts. US Senator Elizabeth Warren deconstructed Wells Fargo CEO John Stumpf's behaviour at a Senate hearing on September 20th in an exchange that promptly went viral. A contributing factor to the clip's popularity is a jarring comparison Warren made between "a cashier who took a handful of twenty dollar bills out of the cash drawer [who'd] probably be looking at criminal charges for theft" (1:47:35) to Stumpf, who kept "[his] job... multi-million dollar bonuses... and went on television to blame thousands of \$12 an hour employees... trying to meet cross-sell quotas that made [him] rich" (1:48:12). In this paper, I report on my analysis of the Senate hearing exchange between Warren and Stumpf, outlining how and why Warren's remarks reframe the dominant neoliberal discourse surrounding business and regulation. I created a transcript from an archived webcast of the hearing and, using a "post-foundational" approach to critical discourse analysis (Macgilchrist, 2016, p. 263), found that Warren's remarks and their uptake in social media suggest that Warren is "resignifying, recontextualising, reframing concepts in ways that previously seemed illegitimate" (p. 264). This paper argues for the use of discourse analysis to examine the context within which our leaders chose to operate. I also demonstrate that the post-foundational approach to critical discourse analysis is a particularly powerful method for uncovering the principles that guide our leaders and argue that it can provide a robust basis for critiquing dominant discourses.

# Saturday Oral Presentation Abstracts

Henry Angus 345, 1:00 pm - 2:30 pm

**Title: The Cellulose Biosynthesis Inhibitor Thaxtomin A Leads to Rescue of the Cellulose Deficient Mutant cob-1 in Arabidopsis thaliana Seedlings.**

**Presenter: Woodley, Marcus**

In plant cells cellulose is one of the most predominant components of the cell wall, responsible for determining the shape of cells and how plants grow and expand (MacKinnon et al., 2006). When the plant pathogen *Streptomyces Scabies* infects crops such as potato it releases a compound called Thaxtomin A (TA) causing the disease common scab. TA works to decrease both the quantity and quality of cellulose in the cell wall, which makes the plant more susceptible to infection (Bischoff et al., 2009). Despite 15-20 million dollars in losses to Canadian farmers annually due to the effects of TA and *Streptomyces Scabies*, the target and mechanism of action of TA remain unknown (Bignell, 2014). Through analysis of the interaction between mutant *Arabidopsis thaliana* seedlings (cob-1) and TA we have identified the A.*Thaliana* COBRA protein as a possible target of TA activity. Under normal conditions, mutations in the COBRA gene and exposure to TA both lead to small dwarf plants, but we have noted that when some cobra mutants are exposed to TA they actually grow larger than without TA. Currently our research is focusing on using fluorescently tagged COBRA proteins to determine what changes occur in plant cells when they are exposed to TA that may lead to this odd interaction. We hope that through our analysis we may uncover information on the function of both TA and the COBRA protein, which could prove vital as a means of combating the massive annual crop losses due to the pathogen *Streptomyces Scabies* and TA.

# Saturday Oral Presentation Abstracts

Henry Angus 354, 1:00 pm - 2:30 pm

## **Title: Good Seizures: The Search For The Most Clinically Effective Practice In Electroconvulsive Therapy**

**Presenter: Green, Katie**

Electroconvulsive Therapy (ECT) is the most effective treatment for severe medication resistant Major Depressive Disorder (MDD) in use today. It consists of eliciting a therapeutic seizure by passing current through the brain of an anesthetized patient. ECT has a bad reputation due to the nature of the procedure and its portrayal in pop culture, however it is still widely used due to its efficacy in the treatment of severe psychiatric illness. Despite this efficacy, very little is known about why some seizures lead to striking improvement in psychiatric symptoms, and others have no therapeutic effect whatsoever. Brain activity during seizure may play a role in this, and electroencephalogram (EEG) recordings of cortical activity are collected and monitored throughout treatment. EEGs produced by seizures (Ictal EEGs) are extremely distinctive and deviate significantly from baseline brain activity. The purpose of this study is to evaluate the possible predictive relationship between certain ictal EEG parameters and patient recovery from illness. In order to examine this, we are looking at the connection between patient improvement throughout ECT treatment course, measured by the clinical global improvement scale (CGI), and physician quality ratings of 4 EEG parameters: Coherence, Amplitude, Regularity and Suppression. Analysis of this data is presently underway, current trends in data show that these parameters may be correlated with outcome measures, however more analysis is needed.

# Saturday Oral Presentation Abstracts

Henry Angus 354, 1:00 pm - 2:30 pm

**Title: Understanding the Immunoprofile of Transitional Cell Carcinoma of the Ovary**

**Presenter: Magrill, Jamie**

Transitional cell carcinoma of the ovary (TCCO) is currently defined as a subtype of high grade serous carcinoma of the ovary (HGSCO) in the 2014 World Health Organization classification system. Despite clear differences in morphology, TCCO has been shown to have a similar protein expression profile to HGSCO, hence its classification as a subtype of HGSCO. However, TCCO is associated with better patient survival compared to HGSCO. Due to its rarity, TCCO has only been studied with extremely limited sample numbers, which may present a challenge for physicians attempting to determine a well-defined phenotype for accurate diagnosis and treatment. Therefore, for this study we have collected a large international cohort of TCCO cases to determine whether TCCO and HGSCO could be distinguished by immunohistochemistry. A tissue microarray containing sections of each tumor was constructed from 89 TCCO with an on-slide control of 16 conventional HGSCO. An additional 216 conventional HGSCO were sourced from a pre-existing tissue microarray. Immunohistochemistry was performed and statistically analyzed for routine HGSCO markers: PAX8, WT1, p53, p16, ER, p63 and GATA3. The majority of TCCO stained positive for PAX8, WT1, p16, and ER, negative for p63 and GATA3, and showed mutant-type p53 expression. These results indicate TCCO has a statistically identical expression profile to that of HGSCO. Further studies will make use of these findings to identify potential protein markers of TCCO, which could explain biological differences between TCCO and HGSCO and might distinguish other ovarian carcinomas with a better prognosis.

# Saturday Oral Presentation Abstracts

Henry Angus 354, 1:00 pm - 2:30 pm

**Title: The Economics of Elderly Suicide in East Asia**

**Presenter: Min, Andrew**

Over the past decade, there has been widespread concern regarding the number of elderly citizens in East Asia who are committing suicide. In South Korea for example, Kwon, Chun and Cho (2009) reported a substantial increase, with 69.6 per 100,000 elderly persons committing suicide between 1991-95, with these figures increasing to 127 per 100,000 in 2001-05. As an issue that is deeply concentrated in a sociological background, there remains a deficiency in the interdisciplinary understanding of the causes of this problem. Based on this, I am analyzing how the discipline of economics can explain for the elderly suicide rates in two countries: Japan and South Korea. In conducting this research, my methodology features economic variables that are developed based on information from existing literature, which will include studies in senior pensions, investment in senior care services, and the elderly poverty gap index. From the time period of 2000 to 2010, I am examining the correlation between these economic variables and the increasing elderly suicide rates in Japan and South Korea. By combining an interdisciplinary focus in my research, I am portraying how we can better analyze the causes of increasing elderly suicide, emphasizing certain inferences that are illuminated through the study of economics. Thus, this research would be highly valuable to the national governments in East Asia, along with international institutions like the World Health Organization that are concerned with the overwhelming elderly suicide rates in the region.

# Saturday Oral Presentation Abstracts

Henry Angus 354, 1:00 pm - 2:30 pm

**Title: ProjectAlign: Guiding Epidurals with Augmented Reality**

**Presenter: Toews, Alex**

Epidural anesthesia is a medical procedure whereby a drug is injected into the middle of a patient's spine, often to ease the pain of childbirth. Ultrasound is known to provide useful needle guidance information in the context of epidural anesthesia. The aim of this work was to determine the feasibility of a new technology (ProjectAlign) which automatically identifies the spinal midline directly at the needle puncture site. ProjectAlign uses a symmetry-finding algorithm (cross-correlation) to identify landmark bone features from ultrasound images of the spine. Real-time guidance information is displayed on the skin by means of a laser projector rigidly attached to the ultrasound probe. A clinical feasibility study was performed to assess the performance of ProjectAlign in identifying the spinal midline in the lumbar region of a dozen participants from the general population. We hypothesized that (i) ProjectAlign can identify the spinal midline within a 5 mm lateral distance of a sonographer's marking, and (ii) ProjectAlign is more laterally accurate than the traditional technique of manual palpation in identifying the spinal midline. Both hypotheses are validated by the data. Midline measurement with ProjectAlign generated an RMS error of 2.0 mm, with a maximum error of 5.0 mm. The results of this study support further investigation into the use of ProjectAlign, in particular for obese patients where manual palpation is most difficult. Future work should expand ProjectAlign's capabilities to include spine level identification.

# Saturday Oral Presentation Abstracts

Henry Angus 354, 1:00 pm - 2:30 pm

**Title: A spatial analysis perspective: Have mosquito net rollouts in Tanzania decreased malaria prevalence countrywide?**

**Presenter: Wang, Tracy**

The deadliest of the malaria parasites, *Plasmodium falciparum*, remains the most common mosquito-borne disease in the United Republic of Tanzania. In order to combat the disease, Tanzania implemented a country-wide mosquito bed net rollout in 2004. The aim of the current study is to examine if the bed net rollouts caused a decrease in malaria prevalence across Tanzania. To achieve this, malaria prevalence was compared across Tanzania from 2001-2003 and 2006-2008. More specifically, environmental conditions were recorded at each location (e.g. temperature, elevation, etc.) where malaria prevalence was recorded. Levels of malaria prevalence across these environmental conditions were then compared before and after 2004. We hypothesized that, if environmental conditions remained relatively the same between the two time periods, malaria prevalence would demonstrate an overall decrease in the later time period due to the bed net rollouts. Data extracted from the Malaria Atlas Project (MAP) and Demographic and Health Surveys (DHS) were used to get the coordinates of where the surveys were conducted, the number of people examined, and the number of people who had malaria. Environmental data were extracted from NASA satellite imagery. Spatial analysis was conducted using ArcMap 10.4 and exported to the R program for statistical analyses. Scatterplots and linear models were created in R and then qualitatively compared. Overall, there appeared to be a lower malaria prevalence rate from 2006-2008 compared to 2001-2003.

# Saturday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**The Influence of Stress on Emotional Adaptation**

Aichmair, Adam

**Children match skill level to problem difficulty in a cooperative setting.**

Ashour, Bana

**Investigating the Health Literacy of Students at an Elementary School in East Vancouver**

Bains, Sean & Hunt, David

**A proposed study on the development of a liposomal formulation of Taxotere and cyclophosphamide Chemotherapy Regimen.**

Cheema, Harleen & Toofany, Manish

**O-Glycosylated Oncofetal Fibronectin as a Therapeutic Target for Lung Cancer**

Cheng, Elisa; Song, Judy & Cheung, Honor

**The Influence of Government Bodies and Geographic Location on Motivational Intensity for Contraceptive Use**

Gentile, Alessandra & Cheung, Vanessa

**"Keep It In The Ground" - The #NODAPL Fight For Indigenous Resurgence And Environmental Justice**

Ghosh Iman

**Correcting Mutations in Uveal Melanoma by CRISPR and HDR**

He, Carol; Wang, Alan & Hassan, Wamia

**The Influence of Emotional Context on Localizing Stimuli across Modalities**

Hu, Miro

**Income Inequality and Economic Growth in Southeast Asia: Is the Kuznets Curve Supported?**

Jain, Ragini & Sumetpong, Natasha

**Excitation Wavelength Optimization Of Reflectance Confocal And Multiphoton Imaging In Human Skin In**

**Vivo**Javanmardi, Arash & Badalan, Alexandru

**Do the Eyes Have It? Evidence Against Social Gaze Cueing**

Kachkvoski, George; Vasilyev, Daniil, & Kuk, Michael

# Saturday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**A ground-breaking marijuana based drug delivery system for combating blindness**

Kamal, Haider

**Indirect benefits of sea star wasting disease on *Evasterias troschelii*, via competitive release from *Pisaster ochraceus***

Kay, Sharon

**Can technology accurately predict head impacts? An assessment of the i1 Biometrics Vector Mouthguards impact detection algorithm during football games.**

Kent, Michael

**The Impact of Airbnb on Local Rents**

Kroes, Sydney; Samarasekera, Vinu; Wu, Wilson & Yolvever, Kaan

**Investigating terrestrial influences on nearshore Pacific salmon diets in the Salish Sea using stable isotope analysis: a comparative study between two distinct vegetation covers**

Langille, Kelsey & Oh, Michael

**Verification of Viscoplastic Fluid Flow through Computer Simulation**

Le, Nguyen

**Antibiotic Activity Screening using Edible Fungal Candidate Species**

Lee, Ian

**mRNA Modification with Large Physiological Effect: Effect of m6A RNA Modification on Cells during ER Stress**

Lee, Chris

**Modeling Cell Polarization and Intercalation During Fruit Fly Development**

Lim, Siang

**The Impacts of Prenatal Alcohol Exposure and Early-Life Adversity on Stress-Regulation Mechanisms in the Developing Brain**

Liu, Jennifer

**Characterization of a new subpopulation of microRNA-enriched, non-exosomal vesicles in commercial bovine milk**

Ly, Sophia & Shan, Christine

**10 Confirmational in 3 Languages, A Comparative Analysis of Heritage and Non-Heritage Speakers' Use of Cantonese, Hindi, and Mandarin Confirmational**

Ma, Cari; Li, Cynthia & Sobotkiewicz, Isabel

# Saturday Poster Presentation List

**On Display: 8:00 am - 8:00 pm**

Irving K. Barber Learning Center - 2nd Floor Foyer

**Optimal Duration of Long-Term Fluoxetine Treatment in Men and Women with Post-stroke Depression**

Madani Kia, Tina & Hatem, Ahmed

**Negative impacts are avoided through an Evergreen rail-line livability survey.**

Madden, Cheryl-Lee

**Analyzing Deterministic and Stochastic Linear Optimization of Reservoir Operation**

Nandal, Sahil; Trichy, Praven Kamalanathan; Mann, Amiteshveer & Jiao, Cathy

**A Whole Human Blood Assay to Screen for Potential Immunomodulators**

Pae, Hannah

**A Heroine's Journey: An Analysis of Female Protagonists Across Different Adaptations**

Almeida, Helena; Lopes Pinto de Almeida, Ribeiro; Zhang, Queenie & Wong, Alicia

**Fire Blight and Apple Scab: A Genetic Analysis of Two Common Apple Pathogens and their Differences in Virulence and Antibiotic Resistance in Interior BC.**

Sun, Sherry

**The Effect of Heat Pads on the Clinical Outcomes of Women with Menstrual Pain and Endometriosis**

Tjoa, Amelia; Adib, Mona; Hamilton, Michée & Zhang, Ivy

**Quantum Dot based Cancer Theranostics**

Tse, Desmond; Lai, Veronica; Hu, Yahan & Behmanesh, Hakhamanesh

**Do you choose whichever goes first: Examining the order effects in psychological scales in the Expanded format**

Tse, Winnie

**Quantum Information Moving Through Space-Time**

Vanderpoel, Liam & Chun, Andrew

**What is the Role of the Linker Region in the IAPV IRES?**

Youm, Jisoo

**A machine learning approach to cell classification**

Zhang, MoHan & Tan, Cindy

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: The Influence of Stress on Emotional Adaptation**

**Presenter: Aichmair, Adam**

Humans seem to exhibit an adaptation bias when confronted with repeating emotional stimuli. For example, being shown one emotional facial expression many times, we are more likely to rate an ambiguous face as displaying the opposite emotion. The purpose of the present study was to investigate the effects of acute stress on this emotional adaptation effect. 273 young adults were assigned to either a stress condition or a control condition. A cold-pressor test in conjunction with critical observation was administered to the stress group to generate acute psychophysiological stress. In a bias-probe task presented before and after an adaptation phase, participants were asked to rate a morphed continuum of 15 ambiguously happy or angry faces, as either happy or angry. A 2-back memory task was implemented as the adaptation training. Participants were shown a series of unambiguously angry faces, and on each frame they were asked to compare the current face to the face they had seen two back (emotional bias was trained in the positive direction). Heart rate, blood pressure, and salivary cortisol analysis, were included to validate stress induction. The analysis revealed that irrespective to the bias-probe session (pre and post adaptation), participants in the stress condition showed a stronger negativity bias especially for unambiguously angry faces relative to participants in the control group. The study results suggest that acute stress shifts trait-like affective biases towards the negative, while emotional learning remains resistant to the effects of psychophysiological stress.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Children match skill level to problem difficulty in a cooperative setting.**

**Presenter: Ashour, Bana**

Skill and difficulty are intimately linked: imagine you're assigned the role of Little League captain for a team from varying experiential levels. Two games are coming up (A against a strong team, B against a weak team) and you want to win both games, how do you decide which teammates you think should go to Game A and which to B? As an adult, you probably think that the skilled players should go to the difficult game. In this study, we investigated when this skill-difficulty link develops in children.

Previous research shows that preschool children are sensitive to skill in learning contexts: they prefer teachers who show expertise (Koenig & Harris, 2005) and provide different information to knowledgeable and ignorant learners (Baer & Friedman, in press). So they might chose the more skilled coach to learn from, but would they also show sensitivity in a cooperative setting?

In our study, we asked children to divide up questions that contrasted in difficulty between two partners. We introduced one partner as skilled and the other not. With a total of 80 children aged 4-7, we found that children aged 5+ matched skill level to question difficulty, whereas four year olds performed at chance. The findings suggest that the conceptualization of skill changes between ages 4-5.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Investigating the Health Literacy of Students at an Elementary School in East Vancouver**

**Presenters: Bains, Sean & Hunt, David**

Interactive health literacy is understood as one's capacity to independently obtain knowledge and make educated health-related decisions thereon. Presently, BC's elementary school curriculum does not emphasize interactive health literacy and the importance of being comfortable in doctor-patient interactions; nor does it focus on empowering students to obtain health information independently. We set out to investigate the interactive health literacy of preadolescents in an inner city elementary school in East Vancouver. Participants were surveyed on the key themes of comfort discussing health related issues with parents and physicians, as well as their comfort obtaining and discerning credible health information on their own. The lack of comfort obtaining and discerning credible health information reported by the participants suggests that the current elementary health education curriculum in BC needs to be adapted in order to develop interactive health literacy among preadolescents

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: A proposed study on the development of a liposomal formulation of Taxotere and cyclophosphamide Chemotherapy Regimen.**

**Presenters: Cheema, Harleen & Toofany, Manish**

Breast cancer is the most common cancer among Canadian women. The most effective treatment for early-stage breast cancer is TC, a chemotherapy regimen consisting of docetaxel and cyclophosphamide dosed at a ratio of 1:8. However, its clinical utility is limited by debilitating side effects experienced by patients with pre-existing medical conditions. Currently, TC is administered in saline as an intravenous infusion. By changing the method of delivery, we believe we can reduce the systemic toxicity of TC. Liposomes represent one of the most effective drug delivery systems that can prolong drug circulation and decrease overall toxicity. Thus, in this study, we plan to use liposomes to create a novel formulation of TC to reduce its side effects. First, docetaxel and cyclophosphamide will be encapsulated into liposomes by using a pH gradient. We believe docetaxel and cyclophosphamide can be successfully encapsulated into liposomes. The resultant liposomal formulation will be tested for in vivo pharmacokinetics by injecting the formulation intravenously into mice. We would expect the liposomal formulation to potentially show improved pharmacokinetics compared to existing TC formulations. The formulation will then be administered in mice-based tumour efficacy models. We would expect the novel liposomal formulation to show improved efficacy compared to its free-drug counterparts. As such, we expect that by encapsulating TC in liposomes, lower doses of TC will be required to achieve desired therapeutic effects. This lowered TC doses will in turn decrease its overall side effects, thereby remedying TC's toxicity concerns.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: O-Glycosylated Oncofetal Fibronectin as a Therapeutic Target for Lung Cancer**

**Presenters: Cheng, Elisa; Song, Judy & Cheung, Honor**

Lung cancer is one of the most commonly diagnosed cancer around the world. It is divided into many subtypes where differences in the cellular mechanisms lead to different behaviours. Non-small cell lung cancer (NSCLC) adenocarcinoma is one of the most common subtypes and, with a median survival of 7-8 months, is also one of the most aggressive. Current research focuses on lengthening the survival period of patients by developing early screening tools and more effective treatments. Previous research have shown that NSCLC adenocarcinoma has a high expression of an O-linked glycosylated fibronectin known as oncofetal fibronectin (onfFN). It is a glycoprotein that has been found in fetal and cancer tissue. onfFN can induce epithelial-mesenchymal transition (EMT), a process where cancer cells may undergo that can lead to metastasis. Previous research has created a mouse monoclonal antibody FDC6 against glycosylation on onfFN in vitro. Testing whether FDC6 can inhibit EMT in mice trial would be necessary for further research, for example, clinical trials. This research explores the effect of FDC6 as a conjugated antibody drug therapy (ADC) on mice with onfFN induced EMT tumours. We expect FDC6 to have an inhibitory effect on onfFN on mice and therefore help inhibit EMT, and reduced tumour sizes would be observed. With this outcome, monoclonal antibody FDC6 can be used as a template for humanized antibody and further research can be done on human trials as a potential new therapy for NSCLC.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Factors Affecting Bird Strikes on the University of British Columbia Vancouver Campus**

**Presenter: Gentile, Alessandra & Cheung, Vanessa**

Bird strikes with urban structures are a major source of bird mortality in North America, having a significant effect on bird biodiversity and contributing to declines in many bird species. There have been three past projects documenting bird strikes on the University of British Columbia Vancouver Campus so far. Research has shown that glass glare and bird strikes are positively correlated, and that Varied Thrush and Golden-crowned Kinglets are top colliders on the UBC campus. This study aims to investigate whether there is a correlation between vegetation type and bird collision rates at UBC. Methods include surveying eight randomly chosen buildings at UBC for evidence of bird strikes everyday for three weeks, then every other day for two weeks. Area of vegetation types projected onto each facade on the buildings will be measured digitally. This research will support the development of bird friendly guidelines to become part of The Green Building Plan on the University of British Columbia Vancouver Campus. More broadly, this research promotes bird biodiversity by identifying factors that contribute bird friendly environments.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: “Keep It In The Ground” - The #NODAPL Fight For Indigenous Resurgence And Environmental Justice**

**Presenter: Ghosh, Iman**

This presentation analyses the NODAPL social movement, a pivotal series of protests by the Sioux Nation and allies in opposition to the Dakota Access Pipeline in the United States. This case encompasses intersectional issues of race and class, examining marginalized Indigenous populations asserting their political sovereignty. The NODAPL movement is thus a site that intertwines two major causes: Indigenous rights and environmental justice.

My presentation looks at the following research questions to address diverse perspectives in the movement: Who are the NODAPL protestors? What motivates individuals to attend and participate in such protest events? And finally, how do NODAPL protestors frame this social movement? These questions allow me to examine collective identity politics, and levels of participation and commitment that people have exhibited to this cause over time. Furthermore, I seek an understanding of why this social movement is considered worthy of attention, and its connections with coalitions and conscience constituents. Finally, I propose some future solutions by exploring the transformative potential of Indigenous self-determination for restorative justice.

I aim to answer these research questions using my field notes from the NODAPL Day of Action protest event held on November 15th, 2016. During my research, I found that media coverage of the NODAPL protests often misrepresented or sensationalized the cause. This is an ongoing colonial practice of discursively erasing Indigenous voices, which strips them of their political agency. Thus, my presentation’s focus on this Day of Action event is a conscious attempt to re-centre Indigenous perspectives as the authoritative voices of their narratives, as they are the ones fighting on the frontlines for their collective rights.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Correcting Mutations in Uveal Melanoma by CRISPR and HDR**

**Presenters: He, Carol; Wang, Alan & Hassan, Wamia**

Uveal melanoma, an aggressive cancer of eye melanocytes, is characterized by harboring heterozygous point mutations in the genes, GNAQ and GNA11, which code for G-proteins of the G $\alpha$ q family of GTPases. The function of G-proteins is to link G-protein coupled receptors (GPCRs) to downstream signalling effectors, including signalling pathways such as the MAPK kinase and the Hippo tumour suppressor pathways. One particular oncogenic hotspot in GNAQ/11 is glutamine(Q)209 which completely abrogate the GTPase activity, locking them in a GTP-bound, constitutively activated state leading to malignant transformation of melanocytes. This study proposes an in-vitro experiment to use the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) Cas9 system to induce double stranded breaks (DSB) around the residue glutamine(Q)209 of the GNAQ gene in melanocytes isolated from a previously described mouse model for uveal melanoma. The mutated sequence may then be repaired by means of homology directed repair (HDR), utilizing the wild type allele as a repair template. Downstream protein products of the MAPK and Hippo pathways may then be measured and compared to non-treated oncogenic melanocytes (GNAQQ209L) and normal melanocytes (GNAQ<sup>wild-type</sup>) to determine if melanocytes in the treated-group no longer display constitutive activity. This would indicate a successful repair of GNAQQ209L mutation. DNA sequencing will also be conducted on the treated melanocytes to confirm successful DNA repair of the mutant allele.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: The Influence of Emotional Context on Localizing Stimuli across Modalities**

**Presenter: Hu, Miro**

Current studies show that emotion can influence people's ability to regulate attention and perception. Emotional auditory cues can lead to different changes in performance in visual and auditory processing behaviours, with people showing different spatial localization ability under emotional sounds compared with neutral sounds. However, the influence of emotional sounds is inconsistent. In some cases, it improves the performance of localization behaviours, while in other cases, it impairs performance. Some of these inconsistencies are potentially caused by the sensory modality of the targets and emotional distractors. In this study, the impact of emotional distraction on spatial localization tasks across visual and auditory modalities was examined. Participants localized a target stimulus (either a dot or beep) within a 180° array, while emotional distractors were presented in either visual or auditory form. Across the entire experiment, both types of distractors were presented with both types of targets. Distractors were presented during the target presentation only; they were not present during the behavioural response. After each trial, participants indicated the specific location of the targets on a semicircular arc representing their entire field of view. Results demonstrated localization performance was significantly impacted by inter-modality emotional distraction; however, there was no significant effect of emotion during cross-modal conditions. For inter-modal trials, the negative sounds increased the localization performance for beeps while happy faces decreased the localization performance of subjects finding grey dots. This difference in effect may be caused by the specific timing of inter-modal and cross-modal competition, with each occurring at different places during processing.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Income Inequality and Economic Growth in Southeast Asia: Is the Kuznets Curve Supported?**

**Presenters: Jain, Ragini & Sumetpong, Natasha**

The correlation between economic growth and income inequality is debated by economic researchers (Ali, 2008; Henley, 2012; Keister 2014; Shin 2012), especially in Southeast Asia where they have not reached a consensus. Hence, the question “what is the relationship, if any, between economic growth and income inequality in Southeast Asia?” aims to determine whether the Kuznets (1955) theory, which hypothesizes that as economies grow, income inequality increases up to a point before decreasing, is applicable within the region. We obtained data on GDP per capita, Gini index, and income share held by top and bottom quintiles between 1981 and 2015 in five Southeast Asian countries from the World Bank. Then, we calculated a coefficient of determination between GDP per capita and the other indicators to interpret the strength of the correlations and test the validity of the Kuznets’ curve. We discovered that Thailand has the strongest average correlation and the Philippines has the lowest. Cambodia also has a relatively strong average correlation, and Vietnam and Malaysia have moderate correlations. We deduced that the Kuznets’ theory is not the most appropriate tool to represent the relationship between economic growth and income inequality in Southeast Asia because GDP might not be a sufficient measure of economic growth. Despite this, the theory applies best with Thailand and Cambodia. These results are significant to other economic researchers, since they provide evidence that there are weaknesses in Kuznets’ theory, but also signify that further research is necessary to completely confirm or refute his claims

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

## **Title: Excitation Wavelength Optimization Of Reflectance Confocal And Multiphoton Imaging In Human Skin In Vivo**

**Presenters: Javanmardi, Arash & Badalan, Alexandru**

Live tissue imaging, as supposed to traditional fixed tissue imaging, does not require damaging the patient's body. Live imaging techniques such as reflectance confocal microscopy (RCM) and multiphoton microscopy (MPM) can show skin cell structure in real time. This property has enabled researcher to use RCM and MPM for early skin diagnosis. However, the image resolution captured by RCM and MPM is not optimized. One factor that influences image quality is the excitation wavelength. Our goal is to optimize excitation wavelength to improve RCM and MPM image quality, specifically the contrast, so that we can see more clear cell and biological structure. We investigated this issue by examining skin of healthy volunteers in real time. We changed both RCM and MPM microscope excitation wavelength from 730nm to 870nm with 20nm increment and acuqired sequence of images with the same field of view. We chose to experiment on components of the skin such as collagen and melanin. These are important marker for skin diagnosis because collagen is a marker of skin aging and melanin mutation may be a signal for skin cancer such as melanoma. From our experiments, we found collagen image contrast can be optimized at longer excitation wavelegnth and melanin image contrast at shorter wavelength. We hope this optimization will improve the live imaging resolution.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Do the Eyes Have It? Evidence Against Social Gaze Cueing**

**Presenters: Kachkovski, George; Vasilyev, Daniil, & Kuk, Michael**

The classic Posner Paradigm has demonstrated that reaction times (RT) are quicker to a stimuli when there is a predictive arrow pointing to it. This is a result of the brain being faster at processing stimuli that have been attended to (the arrow “cues” the stimuli). A novel study by Friesen & Kingstone (1998) altered Posner’s paradigm by using faces as the cue, however the direction of the face’s gaze was not predictive of where the target would appear. Nonetheless, the authors found that RTs were faster for gaze cued stimuli. The authors proposed that the brain may have a mechanism that allows for reflexive orienting in response to gaze, suggesting that we give the eyes special attention. Some have challenged this explanation, proposing instead that the face has a naturally directional quality to it, which acts as a sort of arrow. The present study attempts to assess this question. The facial cueing paradigm was replicated using an actor wearing two masks. This means the actor has one gaze direction, but a bidirectional face. Thus, if the RTs are faster, it would be the result of the gaze, because the one gaze direction is cueing the stimuli. If RTs are the same, this implies the effect is directional, because the face is bidirectional. The present study found that reaction times were not faster for true gaze, i.e. the direction the actor was facing. This suggests that social gaze cueing may not have been responsible for the quicker RTs.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: A ground-breaking marijuana based drug delivery system for combating blindness**

**Presenter: Kamal, Haider**

Glaucoma is a chronic eye disease that ranks as the leading cause of blindness in the world, affecting as many as 80 million people. The front section of the eye is filled with a clear, watery fluid called aqueous humour. When there is inadequate or obstructed drainage of the aqueous humour, the pressure within the eye (intraocular pressure) increases and this pressure exerts a toll on the retina. This thins the tissue in this region and causes damage to the optic nerve, which is responsible for transmission of visual information from the retina to the brain. Expectedly, most glaucoma medications exert therapeutic action by lowering the intraocular pressure, and nearly all of these are administered as eye drops. However, less than 5% of the medication is able to penetrate the cornea due to loss of drug via blinking, which implies that the dosage of drug in these formulations is much higher than required. Therefore, there is a clear, unmet need for novel transcorneal drug delivery vehicles that achieve higher drug penetration at significantly lower dosages. To this end, we have developed a drug delivery vehicle that will release low aqueous solubility drugs into the aqueous humour of the eye. The vehicle is a hydrogel comprised of two FDA-approved, GRAS polymers, and nanoparticles that will carry the drug. We have optimized the composition and characteristics of this hydrogel so that it is a liquid at room temperature and a gel at the temperature of the eye surface (i.e. 32°C). Blinking allows the formation of a thin, uniform coating over the surface of the eye. This minimizes loss of drug and allows the nanoparticles to carry the drug to the aqueous humour. These properties facilitate its application as an eye drop immediately prior to the patient's bedtime, and also permit easy and scalable manufacturing, which greatly simplifies the path towards development of a regulated industrial-scale manufacturing process. Significantly, our formulation exhibits over a 300% increase over control formulations in whole-eye experiments using Bovine eyeballs, thereby paving the way for the introduction of novel anti-glaucoma products to the market.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Indirect benefits of sea star wasting disease on *Evasterias troschelii*, via competitive release from *Pisaster ochraceus***

**Presenter: Kay, Sharon**

Beginning in 2013, an outbreak of sea star wasting disease (SSWD) has led to population crashes of sea stars along the Pacific Northwest. Although many species are known to be vulnerable to SSWD, the combined direct and indirect consequences of the disease on the sea star community remains poorly understood. Through field surveys and laboratory experiments, we investigated how and why the relative abundances of two competing sea star species, *Evasterias troschelii* and *Pisaster ochraceus*, have shifted during the ongoing wasting epidemic. Using the theory of competitive release, we tested how SSWD induced declines of *Pisaster* may mitigate the negative effects of SSWD on *Evasterias*. From 2008-2013, we found *Pisaster* was the most abundant sea star, making up to 99% of the sea star community. However, surveys from 2015 to 2017 showed *Evasterias* made up to 80% of the community. During a six week competition experiment, *Evasterias* grew three times faster in the presence of *Pisaster* than in the presence of other *Evasterias*. *Evasterias* did not effect the growth of *Pisaster*, however such results contradict the common conception of *Pisaster* as the dominant sea star. When exposing laboratory populations of *Pisaster* and *Evasterias* to symptomatic sea stars during a disease susceptibility experiment, both species showed symptoms of SSWD although tanks of *Evasterias* took nine days longer to reach 50% mortality than *Pisaster*. Factors other than competitive inhibition may explain the rarity of *Evasterias* prior to the *Pisaster* declines, however the increasing *Evasterias* abundance and demonstrated competitive ability, points to the need for further investigation of the role of *Evasterias* in the intertidal ecosystem.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Can technology accurately predict head impacts? An assessment of the i1 Biometrics Vector Mouthguards impact detection algorithm during football games.**

**Presenter: Kent, Michael**

Head impacts are a major concern in contact sports as both their magnitude and frequency are linked to concussions and neurological impairment. Monitoring head impacts sustained by players allows for implementation of strategies that reduce head/body impacts, potentially improving athletic performance. A variety of head impact monitoring devices are available including: sensors in mouthguards, helmets, and adhesive patches. One device, the i1 Biometrics Vector Mouthguard, contains a tri-axial accelerometer and gyroscope that gather head kinematic data used to predict if a “true” head impact has occurred. The purpose of this study was to determine the sensitivity (ability to correctly identify an impact) and specificity (ability to correctly identify a non-impact) of the i1 Biometrics Vector Mouthguard head impact detection algorithm during football games. Twenty UBC football players were instrumented with i1 Biometrics Vector Mouthguards. Impact/non-impact calls from the detection algorithm were visually compared to game films and were classified as “true”, “false”, or “not confirmed” by three independent viewers using a standardized method. Predicted impacts were marked as “true” with visual confirmation of contact or head acceleration, while predicted impacts were marked as “false” for non-contact events (i.e. walking). Impacts outside the video frame or obstructed from view were classified as “not-confirmed.” A similar strategy was used to classify predicted non-impact events. Preliminary results show that the sensitivity and specificity of the mouthguard algorithm (76.2% and 89.9%) are comparable or higher than an adhesive head impact monitoring system (xPatch) previously assessed in our lab (77.6% and 70.4%), suggesting that the i1 Biometrics Vector Mouthguards may be more accurate for monitoring head impacts during games.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: The Impact of Airbnb on Local Rents**

**Presenters: Kroes, Sydney; Samarasekera, Vinu; Wu, Wilson & Yelsever, Kaan**

There has been increasing attention paid to the role of Airbnb affecting prices in local rental markets among the general public and policy makers. Data collected from the Airbnb interface shows a rapid increase in the number of short-term rental units available in major US cities. Sparse prior research and media investigations have determined that the presence of Airbnb rentals is correlated with increases in local rents. Theoretically, the conversion of long term rental units to Airbnb may constrict local housing supply, increasing rents. This paper combines novel Airbnb data with rental data to estimate the effect of Airbnb on local rents. A difference-in-difference design is used to isolate the effect of Airbnb on local rents, controlling for differing neighbourhood characteristics and national time trends. Preliminary results suggest that converting 1% of local housing units to Airbnb rentals results in a 1.04% increase in local rental prices though the effect is not statically significant. Failure to control for differences across neighbourhoods inflates this estimate to an implausibly high level of 2.67%. The discrepancy between these estimates suggests that prior attempts to infer a casual relationship based on correlative data may severely overstate the true casual effect. Estimating the true effect of Airbnb on local rents hods importance to informing public policy that aims to regulate short term rentals.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Investigating terrestrial influences on nearshore Pacific salmon diets in the Salish Sea using stable isotope analysis: a comparative study between two distinct vegetation covers**

**Presenters: Langille, Kelsey & Oh, Michael**

Pacific salmon of the Salish Sea provide numerous socioeconomic, cultural, and recreational benefits while also acting as an important contributor to marine and freshwater ecosystems. Estuaries act as key habitats for Pacific salmon by providing them with important food sources as they migrate from rivers to marine waters. While there have been studies on the ecology of estuarine communities, there is a lack of focus on how estuarine conditions can impact feeding opportunities for Pacific salmon. There is some evidence suggesting terrestrial invertebrates comprise the majority of chum salmon fry diets and therefore this food source may be important; however, the overall contributions of terrestrial invertebrates to salmon diets is unclear. Addressing this gap is important given that terrestrial invertebrate inputs are strongly related to vegetation density in adjacent watersheds, many of which are threatened by human development. For our study, we will compare ratios of carbon and nitrogen isotopes between Pacific salmon and potential prey sources to determine the contribution of terrestrial invertebrates into salmon diets in estuaries from two different vegetation habitat types: developed and undeveloped. This will allow inference into how these cross-ecosystem subsidies may influence growth rates of salmon. We expect to find that there will be more terrestrial invertebrate input in the heavily vegetated area than the developed area. Overall, this study will provide understanding of how anthropogenic development around estuaries may impact the prey base for Pacific salmon growth.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Verification of Viscoplastic Fluid Flow through Computer Simulation**

**Presenter: Le, Nguyen**

In this project, theoretical solutions for partial differential equations (PDEs) and fluid flows such as Poiseuille, Couette, and combinations are reviewed. The solution is then expanded to Bingham fluid which is a viscoplastic material commonly found in cement or toothpaste. In specific, Couette-Poiseuille flow of Bingham fluid through concentric annuli was analytically derived by Yu and Ke [1] in different cases. The next step in this project would be to study the same flow as Yu and Ke have done by doing computer simulations. Finite element method (FEM) discretization scheme will be used with the aid of FreeFEM software in order to simulate the flow. The solution will then be compared with the derived analytical solution to see whether they agree with each other. [1] Y.Q. Yu, K.Q. Zhu, Axial Couette-Poiseuille flow of Bingham fluids through concentric annuli, *J. Non-Newtonian Fluid Mech.* 165 (2010) 1494-1504

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Antibiotic Activity Screening using Edible Fungal Candidate Species**

**Presenter: Lee, Ian**

Antibiotics are among the most vital biologically active compounds and are responsible for revolutionizing human health since the discovery of penicillin in the 20th century. As the use of antibiotics has increased during the years since their discovery, antibiotic resistance within bacterial pathogens has also emerged and spread. Because antibiotic resistance poses a severe and current threat to human health, there is an ever-growing need to identify potential sources of antibiotic production to be screened as potential candidates for new antibiotics. Ascomycota and Basidiomycota are divisions within the kingdom of fungi that are known to produce antibiotic compounds, typically within their cultured mycelium or fruiting bodies. Of particular interest for evaluation are edible species of Basidiomycota, which are sought after for various beneficial properties, and do not display obvious toxicity on humans when consumed for these purposes. Previous studies have indicated and found antimicrobial compound production localized within aqueous extracts of fruiting bodies of fungal mycelium. In addition, further studies have also proven the feasibility of utilizing subsurface fungal mycelium towards elimination of bacterial contaminants from the environment. Of eight candidate species of edible fungi tested, we found that four candidate species displaying antimicrobial production, one from *Stropharia*, two from *Pleurotus* and one from the *Ganoderma* genera. These findings show that edible fungal species show promising potential for sources of new antibiotic compounds, and warrant further evaluation through minimum inhibitory concentration testing, fractional extraction of compounds for further characterization and evaluation against mammalian cell lines for determination of inherent toxicity.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: mRNA Modification with Large Physiological Effect: Effect of m6A RNA Modification on Cells during ER Stress**

**Presenter: Lee, Chris**

DNA is the genetic information of a cell or an organism. Genes are the specific sequences of DNA that have physiological effects. In order for the genes to be expressed, the DNA sequence must first be transcribed into RNA, the intermediary genetic molecule, which is then translated into protein. Between the pathway between DNA to proteins, there are many ways for the protein expression to be affected. One of the newer aspects that affect protein expression is the specific modification on the RNA called m6A. The modification can increase or decrease protein production depending on whether the modification is found near the beginning or the end of the mRNA. It was recently found that the cells change these modifications on mRNA to express more stress response proteins in response to heat shock (Zhou et al. 2015). As well, it was recently found that the m6A modification plays a role during Zika virus as well as HIV infection (Lichinchi et al. 2016). This research focuses on how m6A modification affects protein translation during endoplasmic reticulum stress (ER stress), which occurs when there is an accumulation of dysfunctional proteins in a compartment of the cell. Preliminary data suggests that the reduction of m6A modification can attenuate the cells' response to the ER stress, allowing more cells to survive under low to moderate ER stress. As ER stress is implicated in several diseases, diabetes being one, the findings could shed light on how dysregulated m6A modification pathway could affect the body.

## References:

Zhou J. et al. Dynamic m(6)A mRNA methylation directs translational control of heat shock response. *Nature*. 2015; 526(7574):591-594.

Lichinchi G, et al. Dynamics of human and viral RNA methylation during Zika virus infection. *Cell Host Microbe*. 2016; 20:666-673.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Modeling Cell Polarization and Intercalation During Fruit Fly Development**

**Presenter: Lim, Siang**

During development of the fruit fly embryo, a collection of cells known as the germband approximately doubles in length along the head-to-tail axis and narrows along the back-to-front axis. Most surprising is the absence of external forces pulling on the germband. All driving forces for convergent extension arise internally within the cells. The primary mechanism is cell intercalation, a complex process that is regulated by two main components, (1) biochemical signals at the cellular level and (2) mechanical forces and deformation. Both components have been examined separately in prior experiments by biologists, yet, the connection between them remains elusive. To help elucidate the underlying biological mechanisms of cell intercalation, we use mathematics to develop a differential equation model that describes the interaction between biochemical signals and mechanical forces. We propose a 2D vertex-based mechanical model, where each cell is modeled as a hexagon, integrated with a kinetic model that describes the polarization of biochemical signals. Results show that the degree of polarity, non-uniformity in the contractile forces, timing of the structural changes and final amount of convergent-extension generated in our model are all in reasonable agreement with experimental data. Unlike prior vertex-based models in the literature, we do not postulate mechanical rules governing cell-cell interactions. Instead, we account for the underlying biochemistry and predict the mechanical outcomes. This opens a new route through which physics and mechanics can shed light on complex biological processes, which has potential impact in the understanding of human development and the study of genetic diseases.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: The Impacts of Prenatal Alcohol Exposure and Early-Life Adversity on Stress-Regulation Mechanisms in the Developing Brain**

**Presenter: Liu, Jennifer**

Fetal Alcohol Spectrum Disorder (FASD) describes a wide range of deficits associated with prenatal alcohol exposure (PAE). One effect is dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, leading to impaired ability to respond to stress, and increasing likelihood of developing depression later in life. The HPA axis regulates the production and secretion of glucocorticoids, which act through activation of mineralocorticoid receptors (MR) and glucocorticoid receptors (GR). Thus, MR and GR levels determine the sensitivity and response of the brain to glucocorticoid signaling. In addition to the effects of PAE, children with FASD often experience early-life adversity (ELA), in the form of neglect or unstable living conditions. Therefore, this study aims to examine the effects of PAE and ELA individually and combined in order to gain insight into the separate and interactive effects of these early life insults on later life problems. Using a Sprague-Dawley rat model, pregnant dams were randomly assigned to one of three treatment groups: PAE, Pair-fed (PF), and ad libitum-fed-control (C). Following birth, pups were exposed to either normal rearing conditions, or insufficient bedding conditions, which simulates a naturalistic early-life abuse paradigm, from postnatal (P) day 8 to P12. Hypothalami were dissected on P12. We found that both PAE and ELA affected GR levels in female pups only. ELA alone significantly decreased GR levels in C pups. PAE marginally decreased GR levels compared to C counterparts. These findings suggest that PAE alone is able to elicit adverse impacts on hypothalamic GR levels in female pups comparable to ELA.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Characterization of a new subpopulation of microRNA-enriched, non-exosomal vesicles in commercial bovine milk**

**Presenters: Ly, Sophia & Shan, Christine**

MicroRNAs are short (~22 nucleotides) non-coding RNAs that regulate eukaryotic gene expression. MicroRNAs in bovine milk have been found to survive digestion and can cross the intestinal barrier, where they may affect gene expression in humans. While milk microRNAs are thought to be encapsulated by exosomes, recent findings indicate that the milk miRNAs surviving digestion are associated with a novel population of non-exosomal extracellular vesicles (EVs). Here, we identify potential protein markers for these EVs. Using tandem mass spectrometry (MS/MS), quantitative PCR, and immunoblotting, we found nine putative markers whose distribution in fractionated milk correlated significantly ( $p < 0.05$ ) with the distribution of microRNAs miR-125b and miR-223. Interestingly, these candidates could not be detected after proteinase digestion of non-encapsulated proteins. MS/MS identification of digestion products instead revealed eleven proteins associated with the milk fat globule (MFG) membrane. We conclude that miRNA-enriched non-exosomal EVs in commercial milk may be related to MFGs and speculate that they represent a byproduct of milk processing. Our findings suggest new protein markers for studying the dietary uptake of milk microRNAs and illuminate areas for further inquiry into the effects of food processing on human health.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: 10 Confirmational in 3 Languages, A Comparative Analysis of Heritage and Non-Heritage Speakers' Use of Cantonese, Hindi, and Mandarin Confirmationalals**

**Presenters: Ma, Cari; Li, Cynthia; Patnik, Chandni & Sobotkiewicz, Isabel**

With the prevalence of multicultural societies investigating the variation between heritage languages, linguistic varieties spoken by a demographic minority in a society where the dominant language is different (Benmamoun et al 2013), and non-heritage speech offers insight into how languages change in general, and how languages become markers of cultural identity. Montrul (2012) has shown that asymmetries arise between heritage varieties and their counterparts in some areas of the grammar (form-meaning mappings and case specific morphology.) However, little has been said on the differences between heritage and non-heritage use of confirmationalals. Confirmationalals are grammatical devices speakers use when they request confirmation about their beliefs (e.g. Canadian English eh in You have a new dog, eh?). We investigate the range of variation in the use of confirmationalals in heritage and non-heritage speech in Hindi, Cantonese and Mandarin. In Cantonese, the confirmationalals we are investigating are me1 and ho2 (Lam, 2014), in Mandarin, ma, ba, and bu dui (Ettinger and Malamud, 2013), and in Hindi, we are investigating n a which, to our knowledge, has never been investigated. The data is collected through storyboard elicitation (short cartoon stories, Burton and Matthewson, 2015) in the target language with 3 heritage speakers and 3 non-heritage speaker in each of the 4 languages. Biographical informational survey of participants is used as a control measure. Preliminary findings show that heritage speakers use fewer confirmationalals than non-heritage speakers, with fewer contextual (conversational) restrictions.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Optimal Duration of Long-Term Fluoxetine Treatment in Men and Women with Post-stroke Depression**

**Presenters: Madani Kia, Tina & Hatem, Ahmed**

Post-stroke depression (PSD) is a severe neuropsychiatric condition which occurs in approximately 33% of individuals following a stroke. While stroke is more common in men than women, PSD is twice as likely to affect women. A possible treatment for PSD is Fluoxetine (FLX), a common selective serotonin reuptake inhibitor. This randomized, double-blind, placebo-controlled study will be conducted to measure the optimal duration of FLX treatment in men versus women affected by PSD. 76 men and 75 women are observed in this study, (Montgomery-Asberg Depression Rating Scale [MADRS] >19).. Individuals are randomly assigned into three treatment groups: 20 mg of FLX for either 16 weeks and placebo for 24 weeks, FLX for 28 weeks and placebo for 12 weeks, or 40 weeks of FLX. After treatment, patients are evaluated using the MADRS. The primary outcome measures are improvement in mean MADRS scores and relapse rates. Previous FLX efficacy trials show that women respond better to the treatment than men, with a higher mean MADRS decrease (16.6 versus 8.4, respectively;  $P=0.02$ ). We are expecting to find similar results in this experiment, as well as lower relapse rates in the group administered with FLX for 40 weeks. Preliminary data shows that patients administered with FLX for depression have lower relapse rates up to 36 weeks. In summary, women are more responsive to FLX, and the optimal duration should be longer than 28 weeks to prevent relapse.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Negative impacts are avoided through an Evergreen rail-line livability survey.**

**Presenter: Madden, Cheryl-Lee**

This research will examine the plan to extend the existing Millennium Line skytrain in Vancouver along the Broadway corridor. The rationale being: to assess the impact of the proposed skytrain extension on residents living along Broadway. My research question: Will residents along the corridor stay to make use of the resulting increased amenities along the route, or will they relocate because of the negative consequences of increased activity? I propose to carry out a livability survey on existing residents to assess their preferences drawing on similar surveys carried out in both the 1970s and 1990s by Walter Hardwick in UBC's Geography Department. My methods: Current transit orientated development literature review and a review of Hardwick's Urban Futures Project: 1971-74/1990-92, UBC. When Statistics Canada 2016 census tracts become available, begin compiling neighbourhood demographics.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

## **Title: Analyzing Deterministic and Stochastic Linear Optimization of Reservoir Operation**

**Presenters: Nandal, Sahil; Trichy, Praven Kamalanathan; Mann, Amiteshveer & Jiao, Cathy**

Due to limited availability of freshwater resources, conflicting uses of water in areas such as agriculture, power generation and industry, among others are ubiquitous in most parts of the world. Utility providers face the challenges of supplying enough water to various stakeholders, generate power during lean period and provide flood protection during high flow season. The goal of the utility companies such as BC Hydro is to maximize revenue while meeting the conflicting constraints using large-scale optimization models. Large scale models don't account for uncertainties associated with river inflows, market prices and demand. Through our research, we analyze possible options of including the effects of uncertainty in planning models. A base case deterministic linear optimization model for a reservoir is developed to find annual revenues and optimal policy for releasing water from reservoir. We incorporated Stochastic Linear Programming techniques to consider uncertainties and compared the results. Microsoft Excel was used to fulfill the purpose of modelling and analysis. The limitations of deterministic analysis are discussed followed by a theoretical description of advanced Programming Methods, which are evolving to manage uncertainty in reservoir operations. We expect to show the possible ways of incorporating uncertainty in existing models which would lead to better decision making in reservoir operations and add to better lifestyle of common people.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: A Whole Human Blood Assay to Screen for Potential Immunomodulators**

**Presenter: Pae, Hannah**

Immunomodulators are substances that modify immune response and are used in the prevention and treatment of diseases that are linked to chronic inflammation, such as cancer and heart disease. Efforts to identify novel immunomodulators often rely on in vitro screening tests that use either murine or human cell lines or human peripheral blood mononuclear cells (PBMCs). In this study we wanted to establish the relevance of commonly used in vitro immunomodulator assays by comparing the efficacy of putative immunomodulators to our recently developed ex vivo Escherichia-coli (E. coli)- stimulated whole human blood assay. The use of whole human blood more closely mimics in vivo conditions than cell lines or PBMCs. Human blood from healthy volunteers was collected and plated in a 96-well plate, then incubated with 46 naturally derived extracts or purported immune modulators for 15 minutes at 37 °C. Blood cells were then stimulated with E. coli and incubated for 7 hours at 37 °C, 5% O<sub>2</sub> to elicit an inflammatory immune response. The supernatant was collected for measurement of IL-6 levels using an ELISA, and the results were correlated with E. coli- stimulated PBMCs and LPS-stimulated RAW264.7 cell assays. A Pearson correlation analysis revealed that the ability of the immunomodulators to modulate IL-6 expression from human blood did not correlate with results obtained using PBMCs or LPS-stimulated RAW264.7 assays. This suggests that human PBMCs or RAW264.7 assays may not be ideal for screening immunomodulators. Whole blood assays, on the other hand, are rapid, simple, and likely provide a more accurate depiction of in vivo immunomodulatory activity.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

## **Title: A Heroine's Journey: An Analysis of Female Protagonists Across Different Adaptations**

**Presenters: Almeida, Helena; Lopes Pinto de Almeida, Ribeiro; Zhang, Queenie & Wong, Alicia**

In a world of growing feminism, our conceptualization of gender roles is often called into question. Therefore, it is not surprising that feminist ideas have informed our understanding of different fictional mediums. Our research focus is on how later adaptations of a story portray female characters in a different light when compared with the older version. To answer this question, we will analyse three narratives from 1908-2015: Anne Shirley from the Anne of Green Gables series, various portrayals of Cinderella, and the companions of Doctor Who. With Anne, we will compare the Sullivan's three-part miniseries with the original novels, discussing how later adaptations present Anne as a more independent figure and how different versions portray her strong and free-spirited nature. With Cinderella, we will analyse how she has become less passive, and the growing emphasis in recent films on her disposition and intellect over her beauty, as depicted in the original animated Disney film. Finally, we will examine how the characters of both genders in the new Doctor Who challenge the traditional gender norms, in comparison with those from the classic version. Although these works have been the subject of scholarly analysis from a feminist perspective, which we will engage with, we hope comparing versions created during different periods might show new insight on why the social roles of these characters have become increasingly active. We expect to conclude that the female characters' portrayals are a liberation from the passive and dependent female character trope typical in earlier versions.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Fire Blight and Apple Scab: A Genetic Analysis of Two Common Apple Pathogens and their Differences in Virulence and Antibiotic Resistance in Interior BC.**

**Presenter: Sun, Sherry**

Disease prevention of major agricultural crops is an important aspect of pest control to growers, globally. Some of the most devastating diseases to apples are caused by the bacterial pathogen *Erwinia amylovora* (Fire Blight) and the fungal pathogen *Venturia inaequalis* (Apple Scab). Many efforts have been made in finding ways to limit the spread of these pathogens in the field; for example, *E. amylovora* can be controlled by spray application of the antibiotic Streptomycin. However, *E. amylovora* strains that are more resistant to these antibiotics have appeared, and need to be monitored. Furthermore, identifying *V. inaequalis* strains that are resistant or sensitive to apple cultivars with various Resistance genes ("R" genes), will assist in selectively breeding for these desired resistance traits in commercial crops. In this study, antibiotic sensitivity to Streptomycin of various strains of *E. amylovora* was documented by spiro-plating. Additionally, both *E. amylovora* and *V. inaequalis* strains collected from global regions, Western Canada and Interior BC were genetically investigated through Polymerase Chain Reaction (PCR) analysis with species-specific primer pairs for any differences within species. To determine the susceptibility of two apple cultivars, Liberty and Gala, to different *E. amylovora* strains, flower inoculation trials were carried out on fresh apple blossoms. Preliminary experiments revealed genetic diversity among both *E. amylovora* and *V. inaequalis* strains. The flower infection tests showed differences in susceptibility of the two apple cultivars to different *E. amylovora* strains. Finally, low levels of Streptomycin resistance were found in recent *E. amylovora* isolates from Interior BC, representing critical information for growers with regards to efficacy of control practices. Up-to-date assessments on possible changes in pathogen populations will help growers to decide what preventative measures to take in the upcoming growing seasons.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

## **Title: The Effect of Heat Pads on the Clinical Outcomes of Women with Menstrual Pain and Endometriosis**

**Presenters: Tjoa, Amelia; Adib, Mona; Hamilton, Michée & Zhang, Ivy**

*Background:* Dysmenorrhea primarily refers to abdomen pain and cramping during menstruation, which affects more than half of women. A strong association has been reported between dysmenorrhea and endometriosis, which is defined as endometrial tissue growth outside of the uterus. Endometriosis-related dysmenorrhea can be treated with nonsteroidal anti-inflammatory drugs (NSAIDs); however, NSAIDs do not prevent and reduce the recurrence of dysmenorrhea. Heat-pad is a common home remedy frequently applied in dysmenorrhea; however, the effect and underlying mechanism(s) have not been systematically studied.

*Objectives:* Our objectives are to test the efficacy of heat-pad in women with endometriosis-related dysmenorrhea, and to investigate the pain management mechanisms of heat-pad.

*Methods:* A cohort of 60 women (20-50y) who have endometriosis-related dysmenorrhea will be recruited and randomized to two groups. In a six-month period, women will be asked to apply either heat-pads (39°C, n=30) or non-heated pads (n=30) 10h daily for seven days during menstruation. Length, frequency and intensity of dysmenorrhea and participants' quality of life will be asked before and after treatment. Additionally, blood samples will be collected at the start and end of the study, and growth factors and cytokines related to nerve growth were examined.

*Projected results:* Significant improvement of clinical characteristics and reduction of nerve-promoting growth factors/cytokines are projected to be observed in women received heat-pad treatment, but not in women with non-heated pad treatment.

*Conclusion:* Heat-pad treatment is projected to improve the outcome of endometriosis-related dysmenorrhea in women. Reduction of nerve-promoting growth factors/cytokines may be a hypothesized mechanism of this phenomenon.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Quantum Dot based Cancer Theranostics**

**Presenters: Tse, Desmond; Lai, Veronica; Hu, Yahan & Behmanesh, Hakhamanesh**

Globally and in Canada cancer is a leading cause of death. For effective treatment of cancer, early diagnosis and therapy is required. Traditionally, clinicians administer drugs and imaging agents into the bloodstream hoping to reach the tumor area in the body. However, many drug/imaging agent molecules have low solubility in physiological media and can undergo undesired interactions with blood components. In recent times, research has looked towards developing techniques that combine therapy and diagnostics in a single system often dubbed as theranostics. Along with the growth of nanotechnology, there is tremendous effort to develop delivery systems in the nano/micro dimensions. One such system is the quantum dot (QD), which is very attractive because of its easy design and synthesis. The unique optical properties of QDs allow it to be used as a tumor imaging agent. The therapeutic properties come from the ability to functionalize QDs by affixing biomarkers so they can specifically target malignant tumours for drug delivery; since blood vessels near tumor cells have increased permeability and retention, QDs are able to accumulate specifically in cancer cells. We propose creating a QD based conjugate system with a targeting antibody and drug attached to a QD to diagnose and treat breast cancer, a common cancer.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Do you choose whichever goes first: Examining the order effects in psychological scales in the Expanded format**

**Presenter: Tse, Winnie**

My supervisor, Cathy Zhang, has previously found that the Expanded format of psychological scales, which presents positively worded (PW) and reverse worded (RW) items as response options for each scale item, minimizes the acquiescence bias and method effects that often occur in the Likert format (Zhang & Savalei, 2015). This study aims to determine whether order effects exist in the Expanded format scales. There are potentially two types of order effects: 1) primacy effect, a tendency to choose a response option that is presented first or near the top of a list; and 2) recency effect, a tendency to select a response option when it is given last or near the bottom of a list (Krosnick & Alwin, 1987). Six personality scales were employed in the study, including the scales of Big 5 traits and the Rosenberg Self-Esteem Scale. For each psychological scale, four conditions were created: 1) the original Likert format scale, 2) options ordered from low endorsement to high endorsement, 3) options ordered from high endorsement to low endorsement, and 4) options in the PW items ordered from low to high and options in the RW items ordered from high to low. We found that the order of the options does not show an effect in most of the psychological scales that were tested. This is consistent with our study hypothesis that order effects do not affect the validity of the Expanded format scales.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: Quantum Information Moving Through Space-Time**

**Presenters: Vanderpoel, Liam & Chun, Andrew**

In current computers information is represented at its most basic level as a bit, a one or zero. In a quantum computer information takes the form of a qubit, a bit that can be one, zero, or both states at once. Quantum physics imposes restrictions on qubits such as the inability to copy information. These restrictions enable new cryptographic tasks by limiting the ways in which attackers can access information. If we also take into account the inability of particles to move faster than light, it is not clear what new tasks are possible. Previous tasks shown to be impossible must be reconsidered in the context of both special relativity and quantum mechanics. For example, an impossible task would be to deliver a message to someone one light-second away in under one second as this requires information to move faster than light. Bit commitment, a protocol for securing bits in a digital time vault for a given duration, was shown to be impossible in the context of quantum physics alone but can be implemented under the additional constraint of special relativity using qubits. Secure multiparty computation, where two parties want to perform a computation without revealing their inputs, remains impossible even with special relativity included. While some useful tasks can now be achieved, other protocols remain elusive. Our research aims to flesh out this landscape of the possible and impossible by analysing various theoretical tasks.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: What is the Role of the Linker Region in the IAPV IRES?**

**Presenter: Youm, Jisoo**

Every cell in our body carries a genetic code, known as DNA, and it is the basis of who we are. The code gets transcribed into mRNA and ribosomes translate the mRNA to make actual proteins. The process is vital to the cell and, unfortunately, can be hijacked by viruses. The fundamental trait of all viruses is that once it gets inside of a cell, it wants to replicate itself using the machinery of the host cell. There is an insect virus called the Israeli Acute Paralysis Virus (IAPV) that is a part of the Dicistroviridae family. It is a RNA virus that uses a secondary RNA structure called the intergenic region internal ribosome entry site (IGR IRES) to hijack host ribosomes using an extremely streamlined mechanism of translation that requires no initiation factors. Furthermore, it can direct translation to different frames of the genetic code of the virus. The properties of the IRES are not fully understood and we sought to obtain biochemical evidence that the linker region of the IRES has a role in translation. We performed mutagenesis on the U/TA linker region of the IGR IRES. Then we did translation and toeprinting assays to determine the influence of the linker region in translation and ribosome positioning, respectively. We found that mutations in the linker region substantially decreases translation but certain mutations do not affect ribosome positioning.

# Saturday Poster Presentation Abstracts

Irving K. Barber Learning Center - 2<sup>nd</sup> Floor Foyer, 10:00 am - 6:00 pm

**Title: A machine learning approach to cell classification**

**Presenters: Zhang, MoHan & Tan, Cindy**

Individual cells adapt their shape, size and polarity in response to environmental cues, selective pressures and signalling. The precise regulatory mechanism that governs cell morphology is not well understood. Systematic investigation involves experimental modification of biochemical pathways and measuring its correlation with changes in observable traits (phenotype). To facilitate this work, experimental biologists need software capable of analyzing large numbers of microscopic images to recognize cell types and classify cells. Furthermore, automatic cell classification will enable pathologists to rapidly diagnose diseases like leukemia that are marked by cell shape deformation.

Our team has developed tools to identify cells from phase-contrast and fluorescent microscopy with minimal user input using advanced image segmentation methods. We compute features that accurately capture cell geometry (area, perimeter, curvature, circularity, convexity, etc.) and are invariant under translation, rotation and scaling. We employ unsupervised machine learning techniques (dimension reduction, feature agglomeration, hierarchical clustering) to automatically classify cells and validate our result. Future work will involve generation of synthetic annotated images for supervised classification using deep neural networks, ConvNets, etc. We will also investigate cell migration and self organization by extracting motion-based features from live imaging data.