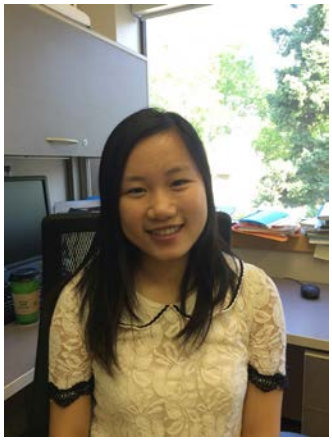
women & children's
health research institute



2014 Summer Student Program Booklet

We Thank...

The Women and Children's Health Research Institute (WCHRI) is a partnership between the University of Alberta and Alberta Health Services, with the generous support of the Stollery Children's Hospital Foundation and the Royal Alexandra Hospital Foundation. Also, the Faculty of Medicine & Dentistry provides operating and in-kind support.

The University of Alberta and the Faculty of Medicine & Dentistry

The University of Alberta strives to create and support an environment of research excellence across the university to fuel knowledge advancement, discovery and innovation; all of which provide significant contributions to society provincially, nationally and globally. It is through the continued support of the University of Alberta's Faculty of Medicine & Dentistry (FoMD), that WCHRI can house many of its core groups and its entire administrative staff. FoMD also provides partial funding for WCHRI's operating expenses, without which WCHRI would not be able to manage its many grants programs and research support initiatives.

Alberta Health Services

Alberta Health Services is a strong and active supporter of WCHRI. Their guidance has been invaluable in ensuring that women and children's health and AHS standards in the delivery of clinical care, wellness and prevention remain a focus of WCHRI's mandate.

The Stollery Children's Hospital Foundation

The Stollery Children's Hospital Foundation is dedicated to raising funds in support of the pursuit of excellence in children's health care. The Stollery Children's Hospital has defined five themes of excellence: journey of the complex child towards optimum health; innovation and discovery; family centred care; investing in highly skilled health care professionals; and appropriate and effective care.

The Royal Alexandra Hospital Foundation

The Royal Alexandra Hospital Foundation inspires community support for their healthcare facilities. The Foundation empowers compassionate, leading-edge patient care through education, research, technology and facility enhancements. They provide support for the Lois Hole Hospital for Women and a growing number of specialized centres of healthcare located at the Royal Alexandra Campus.

...for making this

WCHRI's Summer Studentship & Science Shop Programs

The WCHRI Summer Studentship and Science Shop Programs provide academically gifted students with a competitive opportunity to participate in women and/or children's health research during the summer months. This exposure to and engagement in research is often a first experience in the laboratory for a student and can become the real jumping off point in developing an interest in a research career. What could be more exciting?!

In the following pages, we invite you to learn about the WCHRI summer students funded in the 2014 competition. We are proud of our commitment to these new researchers and look forward to the products of their work.

WCHRI is grateful for the support received from the Stollery Children's Hospital Foundation and the Royal Alexandra Hospital Foundation. Their ongoing financial commitment to this grant program makes this research opportunity possible.

Sincerely,

Dr. Sandra Davidge
Director
Women and Children's Health Research Institute

Our Summer Studentship Program

The WCHRI Summer Studentship program assists students working on specific projects under the supervision of WCHRI researchers. The projects that WCHRI supports through this program span disciplines, research pillars and methodologies, and provide program awardees with outstanding learning opportunities under the guidance of leading experts. WCHRI first offered the summer studentship grant program in the summer 2009. Now in its 6th year, this program truly does exemplify the breadth of areas of investigation that advance research in women and children's health.

Our Science Shop Program

WCHRI has partnered with the Community-University Partnership for the Study of Children, Youth and Families to develop a Science Shop program, originally created in the Netherlands in 1989, here at the University of Alberta (U of A). This program provides an opportunity for students from all departments and disciplines to become involved in a community-based research project in the areas of women and/or children's health. This unique training opportunity brings together U of A students, researchers and community organizations in pursuing summer research projects that encompass multiple perspectives on the issue of women and children's health. The outcomes of these projects often lead to impacts on policy, and directly to the communities involved.

program possible!

2014 Successful Awardees

Summer Studentship Program

Student	Supervisor	Project Title	Faculty-Department
Andrews, Colin G	Pagliardini, Silvia	Medicine & Dentistry-Physiology	Recruitment of abdominal muscle activity and its contribution to ventilation in postna- tal rats
Antony, Nikytha	Maclean, Joanna	Medicine & Dentistry-Medicine	Preterm birth, bronchopulmonary dysplasia and asthma in middle childhood
Arrotta, Nicholas	Rowe, Brian	Medicine & Dentistry-Emergency Medicine	Pediatric Bicycling Injury Prevention Pro- gram: understanding helmet wearing and injury profiles
Aziz, Sarah	Tyrrell, Gregory	Medicine & Dentistry-Laboratory Medicine & Pathology	Identification of pertactin-deficient Bordettel- la pertussis isolates from clinical cases of pertussis in Alberta
Bal, Jasmine	Fedorak, Richard N.	Medicine & Dentistry-Gastroenterology	Improving knowledge regarding reproduc- tion and pregnancy in inflammatory bowel disease: from bench
Bao, Bo	Yokota, Toshifumi	Medicine & Dentistry-Medical Genetics	Exons 45-55 multi-exon-skipping in a dys- trophic mouse model of Duchenne Muscular Dystrophy
Cao, Amanda T	Hemmings, Denise G	Medicine & Dentistry – Obstetrics & Gynecology	Control of blood brain barrier and vascular tone in cerebral arteries by sphingosine
Chu, Nathan	Funk, Gregory	Medicine & Dentistry-	The role of nucleoside transporters and ad- enosine in the hypoxic ventilatory
Croden, Jennifer	Ross, Sue	Medicine & Dentistry – Obstetrics &	Availability and marketing of over-the-count- er remedies for menopause symptoms
Danesh, Ghazal	Pasdar, Manijeh	Science-Chemistry	Functional significance of P53-plakoglobin interactions in ovarian cancer
Ding, Fang C	Zwaigenbaum , Lonnie	Medicine & Dentistry-Medicine	Early behavioral markers of ASD: Novel risk classification using decision tree
Lissinna, Brittany	Yang, Jaynie	Rehabilitation Medicine- Physical	Motor learning on a split-belt treadmill in young children
Mandziuk, Jake J.	Casey, Joseph R.	Medicine & Dentistry-	Identification of small molecules as thera- peutics for corneal dystrophies
Mansour, Yael	Bourque, Stephane	Medicine & Dentistry-Obstetrics & Gynecology	Cardiovascular consequences of prenatal iron deficiency: early mechanisms and therapeutics
Mian, Qaasim N.	Cheung, Po-Yin	Medicine & Dentistry-Pharmacology	Does positive pressure ventilation in preterm babies ventilated at birth cause brain injury?

Summer Studentship Program

Student	Supervisor	Project Title	Faculty-Department
Ou, Zhiyuan (Joe)	Wine, Eytan	Medicine & Dentistry-Physiology	Breaking the barrier: host-microbial interactions in pediatric inflammatory bowel diseases
Peat, Rebecca A.	Lopaschuk, Gary	Medicine & Dentistry-Pediatrics	Role of protein acetylation in controlling energy metabolism in the newborn heart
So, Iyla W	Field, Catherine J	Agriculture, Life & Environmental Sciences-Agricultural, Food & Nutritional Science	Effect of feeding a mixed choline diet on immune development during suckling
Suleman, Raheem	Vohra, Sunita	Medicine & Dentistry-Pediatrics	Pediatric Integrative Medicine (PIM) Trial: usual care in pediatric oncology
Sun, Rose	Davidge, Sandy	Medicine & Dentistry – Obstetrics & Gynecology	Mechanism of resveratrol action to improve cardiovascular function of intrauterine growth restricted rate offspring on a high fat diet
Tiffinger, Alexandria	Waskiewicz, Andrew J	Science-Biological Sciences	Retinal Birth Defect Causality: the role of Growth Factor Bone Morpogenetic Protein 3

Science Shop Program

Student	Supervisor	Community Partner	Project Title	Faculty-Department
Quintanilha, Maira	Bell, Rhonda/ Mayan, Maria	Multicultural Health Brokers	Enrich: promoting appropriate maternal body weight in pregnancy and postpartum through healthy eating	Faculty of Agricultural, Life & Environmental Sciences - Department of Agricultural, Food and Nutritional
Lukasewich, Megan M	Jardine, Cindy	K'alemi Dene School & Queen Elizabeth High	The impact of participatory approaches to research on Aboriginal youths	School of Public Health – Public Health
Sivananthajothy, Priatharsini (Tharsini)	Springett, Jane	Multicultural Health Brokers	Understanding perceptions of community engagement held by stakeholders within the family care clinic planning process	School of Public Health – Public Health Sciences

Our Summer Student Lunch & Share Workshops

WCHRI was very pleased to host two Lunch and Shares for the 2014 summer student programs. Held in May and again in August, these Lunch and Shares provided awardees with the opportunity to meet their peers and learn about the great diversity of WCHRI-funded research being done across campus during the summer months. The lunches were also a forum in which WCHRI could share very practical information and tips to help the students in their programs.

WCHRI is proud to host these events and feels that the Lunch and Shares are an excellent opportunity for us to engage directly with the students and actively participate in their research experience.

Our Summer Studentship Awardees

Name:	Colin Andrews
Supervisor:	Silvia Pagliardini
Project Title:	Recruitment of abdominal muscle activity and its contribution to ventilation during REM sleep.
Motivation:	“Sleep disordered breathing affects a large number of people, but there are still many unanswered questions about respiratory regulation during sleep, especially in newborns.”
Career Aspirations:	“I am looking into completing the MD with Special Training in Research (MD-STIR) program”

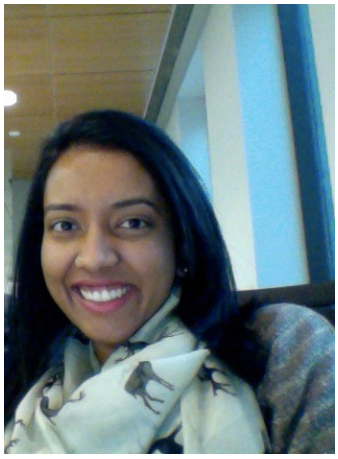
“Breathing in both full term and premature infants is often irregular during sleep, in particular during rapid eye movement (REM) sleep. Apneas (pauses in breathing) are often associated with a drop in oxygenation and can be life threatening. Infants often present with sleep-related breathing disorders due to developing neuronal networks that control respiratory muscles and the immaturity of the respiratory system. The ability to recover from these breathing disturbances is vital to survival, especially during this vulnerable developmental stage. Our laboratory is working on the hypothesis that expiratory muscle activity may be critical during the neonatal period to add additional drive to weak inspiration, as well as to promote pacing of the respiratory system. My project involves both measurement and characterization of the occurrence, and potential contribution to overall ventilation, of expiratory muscle activity across different sleep states.

Sleep disordered breathing affects a large number of people, but there are still many unanswered questions about respiratory regulation during sleep, especially in newborns. I am interested in contributing to a more in depth understanding of this problem.

I discovered this opportunity to work with Dr. Pagliardini after a discussion with one of my physiology professors. This project will allowed me to gain a better understanding of the work involved with basic research discovery that can be applied to future therapeutical interventions. A greater understanding of the scientific underpinnings of medicine will be extremely valuable, as I will be attending Medical School at the U of A in the fall. I am looking into the completing the MD with Special Training in Research (MD-STIR) program where I will draw upon this experience as I conduct clinically oriented research.”

Name: Nikytha Antony
Supervisor: Dr. Joanna Maclean
Project Title: Preterm birth, bronchopulmonary dysplasia and asthma in middle childhood
Motivation: “My topic of research for my undergrad thesis as well the summer following graduation was on asthma medications.”
Career Aspirations: “I was always interested in becoming a pulmonologist but I am also considering family medicine and general pediatrics as possible career choices. ”

“Every year around the world, there are approximately 15 million premature births. In Canada, 1 in 13 children are born premature and Alberta has the highest provincial preterm birth rate. Preterm birth is defined as being born at less than 37 weeks of gestation; extremely preterm birth occurs before 28 weeks gestation. Preterm infants have lower pulmonary function based on spirometry results, increased respiratory symptoms such as wheezing, chest deformities such as pectus excavatum and a greater risk of developing asthma later in childhood. One of the common complications of preterm birth is bronchopulmonary dysplasia (BPD) as the lungs are one of the last organs to develop. BPD is defined as the persistent need for supplemented oxygen at 36 weeks postmenstrual age. It is the result of alveolar hypoplasia secondary to the effects of hyperoxia, barrotrauma and inflammation on an immature lung. Asthma is a disease that is characterized by airway inflammation, hyper responsiveness and reversible airway obstruction. In a study of premature children with and without BPD at school age, it was found that the use of asthma medications and respiratory symptoms such as cough, wheeze, shortness of breath and activity restriction were found more frequently in premature children with BPD compared to without BPD. It is unclear whether the pathophysiology of asthma in preterm infants is the same as childhood asthma found in term born children. It is essential to find out the differences and similarities between the asthma symptoms between children born preterm, children born preterm with BPD and full term children in order to tailor care and prevention strategies in Canada.



I have been interested in the topic of childhood asthma since my undergraduate degree. My topic of research for my undergrad thesis as well the summer following graduation was on asthma medications. I wanted to pursue this interest of mine this summer as well as explore the field of clinical research and that’s why I got involved with this project.

I emailed a few professors from the department of pediatric pulmonology after reading through their research interests and found that I liked Dr. Maclean’s project the most. I was always interested in becoming a pulmonologist but I am also considering family medicine and general pediatrics as possible career choices. ”

Name:	Nicholas Arrotta
Supervisor:	Dr. Brian Rowe
Project Title:	Pediatric bicycling injury prevention program: understanding helmet wearing and injury profiles
Motivation:	“I have an interest in clinical research investigating acute injuries that present to the ED, specifically with pediatrics.”
Career Aspirations:	“My goal is to become an emergency physician with a focus on pediatric public health.”

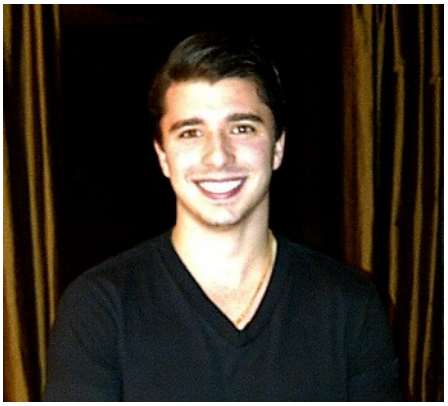
“Bicycle-related injuries are one of the most common types of sports and recreation injuries presenting to North American emergency departments (EDs). These injury events are associated with environmental, mechanical, and factors, most of which are preventable. Head and limb injuries from cycling falls/crashes can result in short and long term consequences and as a result have raised concerns about the safety of cycling.

My objective during this summer is to conduct an exhaustive surveillance project of helmet wearing and fit in children while cycling throughout the Edmonton Zone and a detailed examination of circumstances of pediatric cycling injuries presenting to representative EDs in Edmonton.

I have an interest in clinical research investigating acute injuries that present to the ED, specifically with pediatrics. Bicycling injuries are common, especially during the summer months, but can be prevented with studies supporting helmet use. Exploring factors that limit ED visits and the severity of bicycle injuries in children peaks my interests. I am excited to be participating in a study that exposes me to clinical cases and associated research.

I approached Dr. Brian Rowe, Professor in the Department of Emergency Medicine at the University of Alberta, with an intention to assist in research relating to injuries presenting in the ED. The bicycle study caught my interest as it was an opportunity to actively partake in a project that will impact Edmonton and the surrounding community.

My goal is to become an emergency physician with a focus on pediatric public health. This opportunity aligns perfectly with my aspirations as I am exposed to ED clinical cases and can partake in a study that aims at preventing bicycle injuries in children.”



Name:	Sarah Aziz
Supervisor:	Dr. Gregory J. Tyrrell
Project Title:	Identification of pertactin-deficient Bordetella pertussis isolates from clinical cases of pertussis in Alberta
Motivation:	“Through this studentship, I will develop the necessary skills and perspective required to pursue a career in research.”
Career Aspirations:	“I look forward to a career in the clinical laboratory, helping patients day-to-day while researching ways to improve their future care.”

“Pertussis (whooping cough) is an infection caused by Bordetella pertussis bacteria that severely affects children under six months. Although Canadians have been vaccinated against pertussis since the 1940s, an unexplained nationwide outbreak occurred in 2012. Researchers have proposed that this outbreak may be due in part to genetic changes in circulating pertussis bacteria that make them less similar to the strains used in the pertussis vaccine. As a result, the vaccine may no longer provide adequate protection against whooping cough.

In my project, I tested whether pertussis bacteria recovered from patients with whooping cough in Alberta still make a protein called pertactin, found in our current pertussis vaccine. Though 95% of bacterial strains from the first half of 2012 made pertactin, pertactin production fell rapidly to 51% of strains by the latter half of 2013. In other words, almost half of these bacteria no longer make this protein that is meant to provoke an effective immune response when included in the vaccine. To help determine how pertactin-deficient pertussis has become more common in Alberta, I will identify abnormalities in the pertactin gene in any bacteria without pertactin I find and compare my findings to patients’ vaccination records. Ultimately, this research will help determine whether our pertussis vaccination strategy should change to prevent future outbreaks.

As a medical laboratory science student interested in making research a significant part of my laboratory career, I decided to pursue an Honours in Research designation in my favourite laboratory discipline: medical microbiology. After the co-ordinator of my program introduced me to Dr. Tyrrell, he suggested that I apply for a WCHRI studentship to support my research. This studentship has provided me with the opportunity to build on the skills and personal connections that I will need for a successful career in research.”

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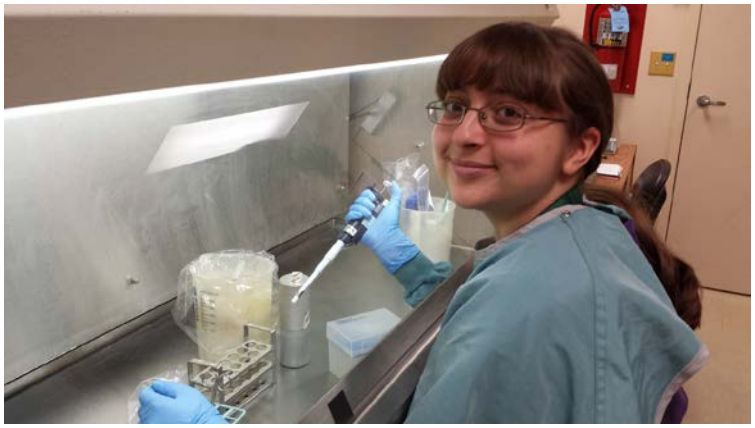


Name:	Jasmine Bal
Supervisor:	Dr. Richard N. Fedorak and Dr. Vivian Huang
Project Title:	Improving knowledge regarding reproduction and pregnancy in inflammatory bowel disease: from bench to bedside
Motivation:	"Despite ongoing research, there are still many unanswered questions regarding the interaction between IBD flares and pregnancy and little in the way of communicating IBD-specific knowledge to the patient."
Career Aspirations:	"My career aspirations are to become a physician and this research opportunity has sparked a new interest in obstetrics."

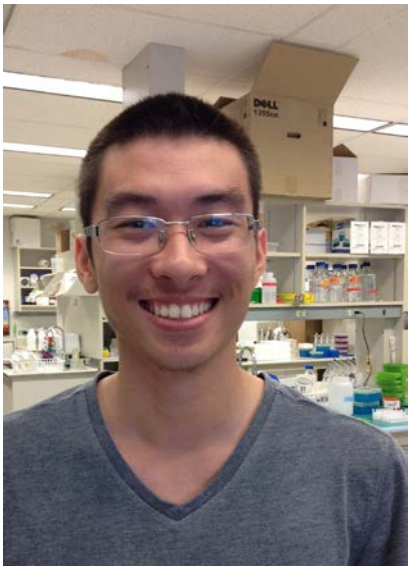
"Inflammatory bowel disease (IBD) typically presents during the childbearing ages which makes it challenging for patients and physicians as they consider the effects of IBD and treatments on pregnancy and the baby. Despite ongoing research, there are still many unanswered questions regarding the interaction between IBD flares and pregnancy and little in the way of communicating IBD-specific knowledge to the patient. Therefore, this project focuses on 1) improving patient IBD-specific reproductive knowledge and addressing patient concerns regarding pregnancy and IBD and 2) identifying biomarkers that can predict who will have IBD relapses during pregnancy so that physicians can address treatment appropriately.

1) To help translate IBD-specific reproductive information to the patient, we are developing an internet-based information portal consisting of multimedia educational modules and bi-directional communication with health care providers. Pre- and post-interaction knowledge and concerns will be compared to show the efficacy of this portal in improving participant knowledge and addressing their concerns. 2) To better understand the pathophysiological interactions between pregnancy and IBD relapse, and to identify biomarkers that can predict IBD relapse, we are investigating changes in blood, urine, and stool inflammatory proteins during pregnancy. The Pregnancy in IBD Clinic at the Univeristy of Alberta has ongoing enrollment of women with IBD at various stages of reproduction. We will compare measurements of inflammatory proteins over the course of pregnancy both within patients and between patients who have IBD relapses and those who do not.

I learned about this opportunity while working as an Office Assistant the Gastroenterology IBD Clinic at the University of Alberta Hospital. I was looking for a research opportunity and Dr. Huang and Dr. Fedorak were looking for a summer student to work on this project. This project is something that I am passionate about because it addresses my interests in education, improving physican and patient interactions, and patient care- espically for those with chronic diseases like IBD. I also find immunology and reproduction fascinating, so I am interested in studying the pathophysiological interactions of IBD and pregnancy.

My career aspirations are to become a physician and this research opportunity has sparked a new interest in obstetrics. This opportunity aligns with my aspirations as it allows me develop a tool to improve patient and physician interactions and study potential biomarkers that could be used clinically to improve patient care. This research project also provides me the opportunity to interact with patients in a clinical setting and learn a lot about the mangement of patient care as well as the physiology of IBD and reproduction."

Name: Bo Bao
Supervisor: Toshifumi Yokota
Project Title: Exons 45-55 multi-exon-skipping in a dystrophic mouse model of Duchenne Muscular Dystrophy
Motivation: “My major motivation for getting involved with the WCHRI summer studentship program is largely due to my prior experiences in research as a high school student.”
Career Aspirations: “I hope to advance into a graduate program and eventually pursue a career in research in medical sciences.”



“Imagine not being able to perform the most basic tasks as a child such as running, hopping and jumping. Duchenne muscular dystrophy (DMD) is a devastating and the most common genetic lethal disorders in childhood. A most promising therapeutic approach to treat DMD is exon skiping. Exon skipping employs short DNA like molecules like Band-Aids to skip over the mutatant gene that blocks protein synthesis. This summer i will work with a cocktail of short DNA-like molecules called morpholinos to target exon 45-55 which is a mutation hot spot for DMD. While there are several oligonucleotide drugs currently undergoing clinical trial, our novel cocktail approach could potentially treat over 60% of DMD patients.

My major motivation for getting involved with the WCHRI summer studentship program is largely due to my prior experiences in research as a high school student. Since high school i was involved in summer research with various laboratories. The experiences and guidance provided by my mentors were invaluable not only for my subsequent research projects but also in my community and leardership involvements. As well, being involved in a research project allows me to bring together the knowledge and skill set i have learnt from my courses and utlize it within an applicative setting. This summer, I was very intrigued by Dr.Yokota’s focus on a novel therapy for treating DMD. As such, I wanted to be engaged in a mentored research project in his lab and prepare for my 4th year Honours project. I learnt of this research opportunity with Dr.Yokota from the research portal on Medicine and Dentistry website. Since i work intensively with the Undergraduate Research Initiative, i have also learnt of the various funding programs offered to undergraduate researchers including WCHRI. After my undergraduate degree, I hope to advance into a graduate program and eventually pursue a career in research in medical sciences. This mentored research opportunity provides me with the knowledge and skill set that is applicable to future research projects i hope to explore later on in my career.”

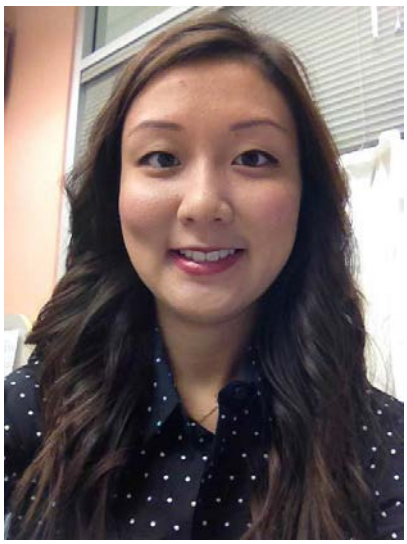
Name: Amanda Cao

Supervisor: Dr. Denise Hemmings

Project Title: Control of the blood brain barrier and vascular tone in cerebral arteries by sphingosine 1-phosphate

Motivation: "What motivated me to participate in this research project is my interest in learning more about pregnancy, childbirth, and the female reproductive system."

Career Aspirations: "This summer I was fortunate enough to be offered a position in Dr. Denise Hemmings' lab to work on a project funded by the Women and Children's Health Research Institute Summer Studentship."



"Early onset preeclampsia is a hypertensive disorder of pregnancy that begins prior to 34 weeks gestation, and is more often associated with life threatening neurological complications than late onset preeclampsia. Increased permeability through the cerebral vascular endothelium that forms the blood brain barrier and increased cerebral artery vascular tone are both contributing factors that lead to neurological complications such as inflammation, seizures, and risk of stroke. A novel mechanism to control vascular tone through the regulation of endothelial permeability by sphingosine 1-phosphate (S1P), a bioactive lipid, was recently discovered. Infusion of S1P inside isolated, pressurized uterine or mesenteric arteries led to concentration-dependent controlled leakage to the underlying vascular smooth muscle cells, and concentration-dependent vascular tone. At low S1P concentrations a tight endothelial barrier was stimulated through the S1P1 receptor. However, at high pathological S1P concentrations, the endothelium became completely permeable through the S1P3 receptor. Vascular tone was regulated between these two extremes by S1P's effect on permeability. If S1P also operates in cerebral arteries to control barrier function and also vascular tone, then abnormally high S1P levels or changes in S1P receptor expression that favour permeability could greatly increase vascular tone and neurological symptoms in women with early onset preeclampsia. Although both S1P1 and S1P3 receptors are expressed, little is known about the vascular role of S1P in cerebral arteries, especially in pregnancy. The goal of this project will be to observe the role of S1P in controlling permeability in the posterior cerebral arteries through their interaction with different receptors. It is anticipated that this study will increase our understanding of S1P and its effect on the arteries of the brain, and therefore have clinical significance in treatment options for neurological problems such as those associated with eclampsia or stroke.

What motivated me to participate in this research project is my interest in learning more about pregnancy, childbirth, and the female reproductive system. Obstetrics and Gynecology is a field I have always been interested in, but never had the opportunity to be exposed to. This summer I was fortunate enough to be offered a position in Dr. Denise Hemmings' lab to work on a project funded by the Women and Children's Health Research Institute Summer Studentship. This is an incredible opportunity for me to learn more about scientific research, build relationships, and will ultimately help me to decide where I want to take my studies in the future."

Name: Nathan Chu
Supervisor: Dr. Greg Funk
Project Title: Muscarinic neuromodulation of persistent inward currents in hypoglossal motoneurons
Motivation: "I was already quite aware of WCHRI's funding opportunities for undergraduate student research since I was awarded a WCHRI summer studentship the past two years."
Career Aspirations: "I have been recently admitted to the MD program starting this fall here at the University of Alberta and I am considering incorporating some research in my career aspirations."

"Obstructive sleep apnea (OSA) is a disorder prevalent among many children. OSA is characterized by repeated events of upper airway obstruction and apnea (no airflow) throughout sleep despite continuous central respiratory efforts. These episodes repeat hundreds of times per night and result in decreases in blood O2, increases in blood CO2, and frequent arousals from sleep. Over the long term, OSA can result in severe cardiovascular disease (hypertension, arrhythmias, and heart failure), increased rates of depression and mortality, and decreased quality of life.

One of the underlying causes of OSA is low hypoglossal motoneuron (XII MN) excitability during sleep, which leads to decreased airway muscle tone and increased risk of airway collapse. XII MNs innervate muscles of the tongue to maintain an open airway during inspiration. During periods of wakefulness, XII MN excitability is high, and tongue muscles are activated to facilitate an open airway. However, during deep sleep, XII MN excitability and airway muscle tone are markedly reduced, such that individuals predisposed to OSA experience hypoventilation, obstruction and apneas during sleep.

The levels of neurochemicals in the brain change during the transition from wakefulness to deep sleep. One of these neurotransmitters, acetylcholine, is implicated in altering the excitability of XII MNs. Acetylcholine may act on specific receptors (muscarinic acetylcholine receptors) on XII MNs and potentiate persistent inward currents (PICs) – ion channels on XII MNs that greatly enhance their excitability. The goal of this project is to test the hypothesis that the PIC of XII MNs is potentiated by the activation of muscarinic acetylcholine receptors.

My 4th year undergraduate research project focused on the modulation of PICs in XII MNs, although it focused on different neurochemicals. I wanted to continue exploring this topic, and since I already was familiar with the experimental techniques required, I could easily transition into this project.

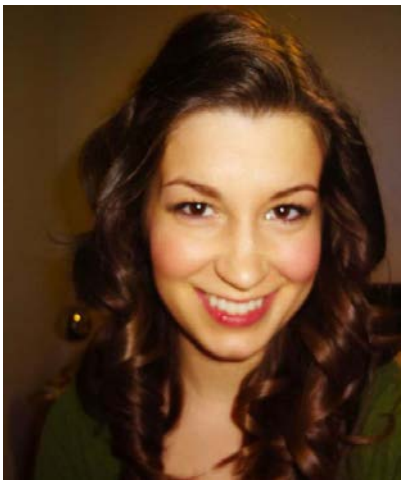
I was already quite aware of WCHRI's funding opportunities for undergraduate student research since I was awarded a WCHRI summer studentship the past two years. My supervisor, Dr. Funk, is also a member of WCHRI and I applied for this studentship under his guidance.

Additionally, I have been recently admitted to the MD program starting this fall here at the University of Alberta and I am considering incorporating some research in my career aspirations. I have learned much during my two years of research and these experiences could act as a foundation for future basic science or clinical research opportunities for me."

Name:	Jennifer Croden
Supervisor:	Dr. Beate Sydora and Dr. Sue Ross
Project Title:	An investigation into the availability of herbal supplements for menopausal symptoms in Canadian pharmacies
Motivation:	“I wanted to do research based in women’s health that would have the capacity to be accessible and meaningful to both the scientific community and women without a science background.”
Career Aspirations:	“I hope to pursue a career in medicine and am especially interested in the areas of obstetrics and gynecology.”

“Menopause is a natural phase in a woman’s aging process, characterized by the cessation of menstruation. Women who are going through the menopause transition can experience physiological symptoms that significantly impact their quality of life, including vasomotor, mood, sleep, and urogenital changes. While traditional hormone therapy remains an option for treating menopausal symptoms, concern about its possible adverse effects is causing more women to seek alternative treatments, including herbal remedies often found in over-the-counter natural health products. The goal of this study was to investigate the over-the-counter natural health products for menopause available to the average Canadian woman, the efficacy and safety claims made by the manufacturers of these products, and the process of natural health product regulation in Canada.

I learned of this research opportunity through the Undergraduate Research Initiative at the University of Alberta. This project was intriguing to me because of its relevance to the lives of such a large portion of adult women, as well as to the physicians and pharmacists that advise these women of their treatment options for menopausal symptoms. In addition to gaining research experience, this project has given me the opportunity to present my research findings at student conferences, draft a manuscript for publication, and gain knowledge that will serve me well on my journey to become a physician. I am grateful to my capable supervisors that lead me fearlessly through the entire research process, and to WCHRI’s Summer Studentship Program for the opportunity to pursue my research interests.”



Name: Ghazal Danesh
Supervisor: Manijeh Pasdar
Project Title: Cell-Cell adhesion proteins in ovarian cancer
Motivation: “After completing several laboratory courses, I was interested in gaining practical laboratory experience and further knowledge about cancer.”
Career Aspirations: “My professional goal is to become an oncologist. This research will provide me with insights into molecular cell biology and mechanisms underlying cancer development. I also learn how knowledge from basic science can be translated to effective diagnostics and therapies.”

“Ovarian cancer is one of the main causes of cancer death among women. It is the most deadly gynecological cancer, with only 20% survival rate beyond 5 years. This low survival rate is due to the difficulties in early detection and elucidation of mechanisms underlying ovarian cancer development and progression. Disruption of cell-cell adhesions is a major contributing factor to tumor development and metastasis and very little is known regarding the role of cell-cell adhesion proteins in ovarian cancer. My project focused on characterizing several cell-cell adhesion proteins in ovarian cancer cells with the ultimate goal of finding potential diagnostic, prognostic and therapeutic markers. Cell-cell adhesion proteins interact with each other to hold cells together and allow them to function as a unit within the ovarian tissue. In addition to attaching cells, these proteins function in physiological pathways that regulate cell growth, proliferation, and survival. Deregulation of these pathways can induce tumour development and metastasis. We began our studies by determining the presence and cellular localization of several cell adhesion proteins in seven ovarian cancer cell lines of different origin. We also used specific assays to determine the tumorigenic and metastatic properties of various cell lines expressing different complement of cell adhesion proteins. These studies are the first comprehensive analysis of cell adhesion proteins in ovarian cancer and provide the foundation for further investigation of their feasibility as potential diagnostic, prognostic and therapeutic markers.

Primary motivation to participate in research: after completing several laboratory courses, I was interested in gaining practical laboratory experience and further knowledge about cancer. My supervisor is a WCHRI member and encouraged me to apply for a summer studentship

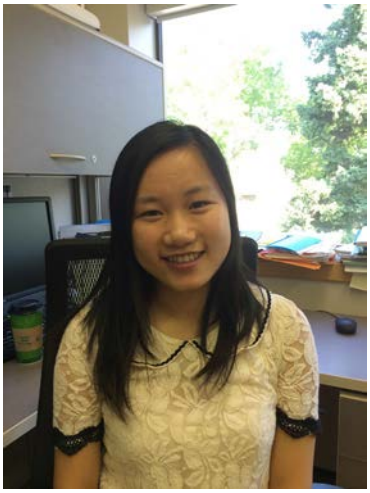
Application of research to career aspirations: My professional goal is to become an oncologist. This research will provide me with insights into molecular cell biology and mechanisms underlying cancer development. I also learn how knowledge from basic science can be translated to effective diagnostics and therapies.”

Name: Linda Ding
Supervisor: Lonnie Zwaigenbaum
Project Title: Early behavioural markers of ASD: Novel risk classification using decision tree models
Motivation: “This research project aligns with my interest in autism and developmental pediatrics.”
Career Aspirations: “My goal is to become a physician.”

“Early identification of Autism Spectrum Disorder (ASD) is crucial in facilitating earlier access to intensive targeted intervention, which can lead to better long term outcomes in kids with ASD. In order to faciliate earlier identification of ASD, The Autism Observation Scale for Infants (AOSI) was developed as a tool to measure early behavioral signs of ASD in high-risk (HR) infants, ie younger siblings of children with ASD. This 16-item measure covers aspects of communication, social interaction, attention, play, and sensorimotor function. Classification tree models are nonparametric decision-tree learning techniques that use recursive partitioning of item-level data into binary categories in order to predict the final group membership. This research project aims to apply decision tree analysis on 6-, 12- and 18- months AOSI data in order to develop risk prediction algorithms that could, on an individual basis, identify infants that are at higher risk of getting a diagnosis at 3 years of age. The classification tree developed could be used to support earlier diagnosis of ASD.

Autism had always been a special interest having previously worked with autistic children during my undergrad. I felt this research project was an excellent opportunity to both work on a topic that I felt was very meaningful, and learn more about clinical research at the same time. I contacted Dr.Zwaigenbaum because of my interest in developmental pediatrics, and was offered a summer student position.

As I will be going into second year of medical school in the upcoming year, this studentship has been valuable in that it has given me the opportunity to work in a hospital setting, learn more about clinical research and the practice of medicine. I am extremely grateful for this opportunity.”



Name:	Brittany Lissinna
Supervisor:	Dr. Jaynie Yang
Project Title:	Motor learning on a split-belt treadmill in children
Motivation:	"I was interested in learning more about motor adaptation beyond what I had learned in the classroom and was drawn to the opportunity to develop research skills and learn about what a career in research might look like."
Career Aspirations:	"I am considering a career as a clinician-scientist in the area of pediatric neurology. What I Learned: This summer I have learned about participant recruitment and a variety of techniques used to capture and analyze motion data."

"Walking in daily life requires frequent adjustments to accommodate short-term changes in our environment, such as walking on sand or ice, or longer term changes, such as fluctuations in our weight, height or strength. These adjustments are achieved through a process called motor adaptation, a type of learning that allows us to continually adapt to our environment. Previous research has demonstrated that this learning occurs differently in typically developing children compared to adults, but little is known about children with early brain injury. This study compares how children with perinatal stroke (stroke during the fetal or newborn period) adapt their walking compared to children without injury, and whether they are able to retain this learning equally well on the following day.

A split-belt treadmill (i.e., a treadmill with two belts run at different speeds) is used to create a novel environment from which to assess motor adaptation in both uninjured children and children with perinatal stroke. If children with perinatal stroke show a different time course and/or a different ability to retain their learning compared to uninjured children, therapy for such children must then be adapted to their learning ability. For example, if learning takes more repetition, the number of steps per session could be increased, and if retention of learning from day-to-day is less, than the spacing and number of repeated training sessions must be adjusted. In this way, we hope to tailor the rehabilitation to be better suited to the specific needs of children with perinatal stroke.

While looking at the different research groups on campus studying locomotion, Dr. Yang's project was particularly interesting to me because of it's focus on children. As a WCHRI member she was aware of the Summer Studentship opportunity and encouraged me to apply.. Participating in summer research has provided insight into what a career in research entails as well as given me the opportunity to engage in patient recruitment, data collection and data analysis. I am very appreciative of WCHRI and Dr. Yang's lab for providing this opportunity and I look forward to applying what I have learned this summer in a future career in pediatrics."

Name:	Jake Mandziuk
Supervisor:	Joe Casey
Project Title:	Identifying chemical correctors for the folding defect in corneal dystrophy-causing mutants of SLC4a11
Motivation:	“The opportunity to be part of an incredible team of people devoted to making discoveries that have the potential to make life a little easier for those who need it”
Career Aspirations:	“To continue in medicine and develop into a person who can provide answers to daunting questions.”

“My research project revolves around a membrane protein called SLC4a11. Mutations in this protein lead to protein misfolding and retention in the endoplasmic reticulum. SLC4a11 mutations cause three posterior corneal dystrophies, two of which are recessive (CHED and Harboyan Syndrome) and one of which is dominant and late onset (FECD). Together these will affect 4% of North Americans. Currently, the only available therapy is corneal transplantation, which is complicated by lengthy wait times and the risk of graft rejection. Our goal is to identify small molecules that could be used to correct these diseases. However, thousands of compounds will need to be screened, which calls for a high throughput assay that is capable of detecting mutant SLC4a11 that has been rescued to the plasma membrane. We are currently working on a novel high throughput assay that is based on bioluminescence resonance energy transfer, involving the transfer of energy from one membrane protein to another to generate light. We are working on adapting this to a 96 well plate so that we are able to screen numerous compounds with each experiment.

This is now my second summer working in the Casey Lab, a valuable and informative opportunity which had originally presented itself as a listing on the Faculty of Medicine and Dentistry website. I am hoping that my experience with research will give me the insight on how to utilize groundbreaking research to complement future medical practice.”

Name:	Yael Mansour
Supervisor:	Stephane Bourque and Ferrante Gragasin
Project Title:	Mechanisms underlying prenatal iron deficiency-induced programming of cardiovascular function in the offspring.
Motivation:	“I am interested in research pertaining to fetal programming: how insults during pregnancy impact the growth and development of the offspring, thereby predisposing them to disease in later life.”
Career Aspirations:	“My goal is to pursue a career in health sciences, where I can create and improve current health policies.”

“Iron deficiency is the most common nutritional disorder in the world, affecting an estimated 66-80% of the global population (WHO 2003), with pregnant women being the most susceptible subgroup. Previous findings have shown that offspring that were iron deficient during development are at a greater risk of developing cardiovascular disease in later life. Despite its prevalence and tendency to afflict pregnant women, iron deficiency in pregnancy is understudied and the processes by which it impacts fetal growth and development are not known. This work endeavors to identify early processes by which insults during pregnancy impact fetal development and send the offspring on a course towards a life full of health problems, so that we may target and prevent these early events, to ensure a long and healthy life for our children. My project aims to determine how iron deficiency affects oxygen transport and free radical production in the fetus. The ultimate goal of this research is to devise therapeutics that can be used during pregnancy to prevent the long-term health consequences of maternal anemia during pregnancy.”

Name: Qaasim Mian
Supervisor: Georg M. Schmölzer and Po-Yin Cheung
Project Title: Positive pressure ventilation and brain injury in premature infants
Qaasim Mian
Motivation: "This research project is particularly interesting for me because it gives me the opportunity to work in a hospital environment, where I have the opportunity to learn from physicians treating premature infants."
Career Aspirations: "I am currently entering my second year of medical school at the University of Alberta"

"premature babies have difficulty breathing at birth and need respiratory assistance, referred to as resuscitation. This treatment consists of gently inflating their lungs with a resuscitation device and a facemask. The clinical team puts a facemask around the baby's mouth and nose and blows air into a baby's lungs, each repetition of which is referred to as a puff. However, there is a lack of real-time clinical information regarding how effective the clinical team is in helping babies breathe. Ineffective small puffs can delay oxygen delivery to the brain and oversized puffs can damage the lung and reduce blood flow to the brain. Both under-ventilation (not delivering enough volume) and over-ventilation (delivering too much volume) can be harmful to the lung and brain. At the Delivery Room of the Lois Hole Hospital for Women, we use a state-of-the-art recording system to monitor oxygen levels and volume delivered to premature babies, as well as the brain function, during the first minutes after birth.

My research project aims to study the relation between over- and under-ventilation and how this might affect brain injury in premature babies. By examining the effectiveness of the clinical team in administering breathing support and comparing it to brain function data routinely collected from the newborn infants, I can examine the relationship between these two factors. This information will help us better understand support to help babies breathe and how we can use this information to improve the care for this babies immediately after birth.

This research project is particularly interesting for me because i) it gives me the opportunity to work in a hospital environment, where I have the opportunity to learn from physicians treating premature infants, ii) the results of my project can be translated to improve care for premature babies requiring breathing support, and iii) it allows me to work within the field of neonatology, which is of specific interest to myself and may be a path I pursue further in the future.I was working on this same project last summer as a WCHRI summer student, so this year I will have a greater opportunity to explore this field.

This research project gives me an opportunity to work in a hospital environment, interact with numerous health care professionals including physicians, nurses and support staff, and learn more about the practice of medicine and the research behind it. I am currently entering my second year of medical school at the University of Alberta, so this project will give me valuable experience that will be useful to me, including exposure to the specialty of neonatology which I may pursue in the future."

Name: Joe Ou
Supervisor: Dr. Eytan Wine
Project Title: Breaking the barrier: host-microbial interactions in pediatric inflammatory bowel diseases.
Motivation: "I am contributing to the understanding of diseases that involve complex interactions between many factors including genetics, the environment, and gut microorganisms."
Career Aspirations: "This opportunity aligns well with my goal of becoming a physician."

"Inflammatory bowel diseases (IBD) are immune-mediated diseases affecting primarily the small and large intestines with increasing incidence in Canada, especially among children. While the cause of these diseases remains unclear, changes in gut microorganisms have been identified in IBD patients and may be one of the factors contributing to these diseases. It remains unclear whether these IBD-associated microbial changes are a cause of inflammation, an effect of the disease, or both.

My research project focuses on two goals to help clarify this conflict. First, I am comparing the invasiveness of Escherichia coli strains isolated from IBD patients and non-IBD controls to determine whether differences in bacterial properties could contribute to gut injury in IBD. Second, I am establishing the ability of aspirates collected during endoscopy from IBD patients and non-IBD controls to alter the invasiveness of known E. coli strains. This goal will enable determination of the effect of the host environment on bacterial properties. By increasing understanding of IBD, better methods of managing these diseases may be discovered, especially in children.

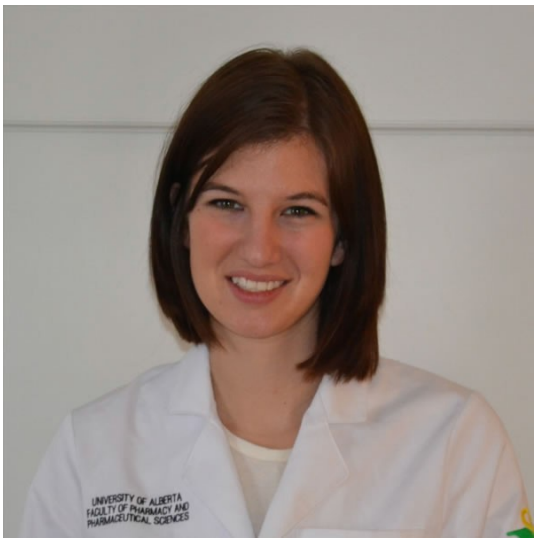
I found this project particularly interesting because I am contributing to the understanding of diseases that involve complex interactions between many factors including genetics, the environment, and gut microorganisms. Furthermore, this opportunity aligns well with my goal of becoming a physician. I learned of the WCHRI Summer Studentship during discussion with Dr. Wine about the specifics of my project. I am very grateful for the support that WCHRI has provided me."

Name: Rebecca Peat

Supervisor: Dr. Gary Lopaschuk

Project Title: Role of protein succinylation in the regulation of energy metabolism in the newborn heart.

Motivation: "I participated in the Heritage Youth Researcher Summer (HYRS) program when I was 17 and I really enjoyed research. I wanted to participate in research again to see if this is a career opportunity I would like to pursue."
"Currently, I am working towards finishing my Bachelor of Science in Pharmacy degree."



"The heart is a high energy demanding organ which depends mainly on the oxidation of fatty acids and glucose to produce adenosine triphosphate (ATP) required for the maintenance of its function. The remainder of the ATP is derived from glycolysis, the oxidation of lactate and ketone bodies. The energy substrate preference differs between the adult and neonatal heart. During the fetal life, the concentration of free fatty acids is very low and the heart relies mostly on glycolysis and lactate oxidation to meet energy demands. Shortly after birth, major changes occur in energy metabolism which are characterized by a shift from glycolysis to fatty acid β-oxidation. The increase in fatty acid β-oxidation is related to maturational changes of transcriptional factors and we propose changes in post-translational modifications are also responsible. These post-translational modifications include that succinylation may control key enzymes of fatty acid β-oxidation.

Recent studies have shown that lysine succinylation is an important post-translational modification that may be involved in the regulation of cardiac energy metabolism. Almost every enzyme in glycolysis, glucose oxidation, fatty acid β-oxidation and the tricarboxylic acid cycle is succinylated on at least one lysine residue. However, the impact of this post-translational modification on the activity on key enzymes is poorly understood. The purpose of this study is to determine the role of lysine succinylation in regulating cardiac energy metabolism and the contribution of this post-translational modification in the dramatic energy change seen during maturation. A better understanding of these metabolic pathways should facilitate the development of better therapeutic strategies to protect the heart."

Name:	Iyla So
Supervisor:	Catherine Field
Project Title:	Effect of feeding a mixed choline diet on immune development during suckling
Motivation:	"The main goals of my project were to establish the importance of dairy-derived choline to maternal and infant health and to establish the importance of consuming different forms and amounts of choline on the immune development of offspring."
Career Aspirations:	"I aspire to continue learning and to eventually work in a field within or related to public health where I can integrate knowledge to better the human quality of life through recognizing it's connection with our environment."

"My project was part of an ongoing animal study in which the effect of supplementing of choline in different amounts and forms was investigated in the immune systems of rat dams and their pups. Since humans produce some choline biosynthetically it is not considered an essential nutrient in Canada. However Dr. Field's group has demonstrated that choline is essential during the lactation period and that on average lactating women are only consuming 50% of the recommended choline intake. This period is critical for the infant's development including the development of the immune system. A poor maternal intake of choline is associated with poor infant growth and brain development. The main goals of my project were to establish the importance of dairy-derived choline to maternal and infant health and to establish the importance of consuming different forms and amounts of choline on the immune development of offspring. To accomplish these goals I assisted with the isolation of immune cells from various tissues of the experimental animals, acquired, and analysed flow cytometry data from these cells. Primary motivation to participate in this research.

After enjoying my research last summer I wanted to do so again but in a different lab to gain more experience and insight on the workings of a lab. Realizing how little I knew about about nutrition and how important it is I decided I needed to learn more about what I have been and should be eating. Since I also have an interest in immunology, Dr. Field's group and their research on nutritional immunology fit my interests well.

During an Undergrad Research Initiative poster session I had come across a poster from a previous summer student of Dr. Field's investigating a link between nutrition and immunology. I thought that this was quite interesting so I later approached Dr. Field to see if she would take a summer student for this year.

I aspire to continue learning and to eventually work in a field within or related to public health where I can integrate knowledge to better the human quality of life through recognizing it's connection with our environment. I hope to enter graduate school and this summer research position has been an excellent place to gain experience."

Name:	Raheem Suleman
Supervisor:	Sunita Vohra
Project Title:	Comparative effectiveness of integrative medicine as compared with standard care in pediatric inpatients
Motivation:	“While complementary and alternative medicine (CAM) is used by many children, the effectiveness of adding CAM to pediatric inpatient standard care (i.e. pediatric integrative medicine, PIM) has been under-studied.”
Career Aspirations:	“I enjoy both the mesoscopic and macroscopic aspects of medicine, and would love to be able to work with individual patients while advocating for large-scale public health promotion.”

“Pediatric inpatients frequently experience pain, nausea/vomiting, and/or anxiety during their admission, yet these symptoms are often under-diagnosed and under-treated. Aside from augmenting their discomfort, such symptoms can actually delay recovery and have long-term neurodevelopmental impacts; therefore, it is crucial that they be recognized and adequately addressed in all patients. Although pharmacotherapy has proven effective in this regard, it carries risks of its own; many families are interested in exploring non-pharmacological approaches to these symptoms, including acupuncture, massage therapy, and Reiki. In this pragmatic controlled clinical trial, we sought to determine the effectiveness and safety of these therapies when offered in an integrative fashion to pediatric hospital inpatients.

Having collected data on patient demographics, symptom prevalence, safety, quality of life, and parental satisfaction in both the usual care and integrative medicine arms of the trial, my role was to conduct the initial statistical analysis of our results. I was drawn to this project because it allowed me to expand on my knowledge of statistics, and to generate findings that could be immediately translated towards the improvement of patient care. Although my prior research experience has been in the field of molecular genetics, many of the fundamental skills I learned in that discipline were equally applicable here, and I am firmly convinced that that the skills I gained this summer will likewise be applicable in my future endeavours. In that regard, I am particularly grateful to Dr. Vohra, Dr. Adams, and the entire Complementary and Alternative Research and Education (CARE) program for the mentoring they have provided me, and to WCHRI for their generous funding of my work.”

Name:	Rose(Doulin) Sun
Supervisor:	Dr. Sandra Davidge
Project Title:	Mechanism of resveratrol action to improve cardiovascular function of intrauterine growth restricted rate offspring on a high fat diet
Motivation:	“I have always been fascinated by cardiovascular physiology and its applications in health care.”
Career Aspirations:	“In the future, I hope to further my passion in research either as a clinician scientist or to pursue graduate studies.”

“Established research in developmental origins of cardiovascular disease has suggested that complications in pregnancy resulting in suboptimal intrauterine environments may increases risks of cardiovascular morbidities later in life. Fetal hypoxia is a prenatal stress that can be caused by complications such as preeclampsia and will lead to intrauterine growth restriction (IUGR). The Davidge laboratory has shown impaired vascular endothelial function and susceptibility to cardiac ischemia are exacerbated in the early stages of life by additional stressors such as a high-fat (HF) diet. The application of these findings leads us to find possible ways to reduce these risks. This is especially important when postnatal stressors further elevate the risks caused by prenatal IUGR.

Resveratrol is a polyphenol found in grape skin that has show antioxidant property and has therapeutic effects in decreasing risk for cardiovascular disease. Further, the beneficial effect of Resv is linked to its antioxidant property and has been shown to stimulate nitric oxide (NO) production along with increased endothelial nitric oxide synthase (eNOS), inducible NOS (iNOS) and neuronal NOS (nNOS) expression.
Therefore, in my project I will be looking into the cardiovascular function of Resveratrol with exposure to high fat diets through vessel function analysis to inquire into the possible mechanisms of action.”

Name:	Alexandria Tiffinger
Supervisor:	Dr. Andrew Waskiewicz
Project Title:	Retinal birth defect causality: the role of the growth factor bone Morpogenetic Protein 3
Motivation:	“My primary motivation to participate in this researh was my interest in developmental biology.”
Career Aspirations:	“Following the completion of my Bachelor of Science, I plan to go to graduate school and work towards a Master of Science in the field of developmental biology.”

“A fundamental process in the formation of different organs is the fusion of tissues. If this process is incomplete it can lead to a variety of pediatric disorders including: cleft lip, cleft palate, spina bifida (neural tube defects) as well as ocular anomalies. Many of these conditions have long term consequences, and several require corrective surgery. Intriguingly, the molecular mechanisms controlling tissue fusion are very similar in different parts of the body, allowing progress made studying one tissue to be helpful in advancing understanding in a second. Amongst tissues where fissure closure is important, the eye’s transparency permits study of the process, making it an ideal model to use. Our research uses analysis of pediatric patient DNA to identify the causative variants (mutations) together with studies in animal models, to identify the pathways controlling optic fissure closure. We have strong evidence that a molecule that functions to control signals between cells (BMP3), contributes to this process. We have identified five children with ocular birth defects that have mutations in BMP3. Accordingly, we will test whether this factor is essential in embryonic eye development and whether the identified variants in BMP3 are likely pathogenic.

My primary motivation to participate in this researh was my interest in developmental biology. In fall 2013, I took a Developmental Biology course taught by Dr. Waskiewicz. Before taking this course, I had little interest in genetics; Dr. Waskiewicz opened my eyes to the wonders of developmental genetics, and I wanted to immerse myself in the field as much as possible. I approached Dr. Waskiewicz about spending the summer in his lab, and he presented me with the opportunity of the Women & Children’s Health Research Institute Summer Studentship Program. In previous undergraduate lab experiences, I had already discovered my love for the lab, but I had yet to find my specific passion - which I have in developmental biology.

Following the completion of my Bachelor of Science, I plan to go to graduate school and work towards a Master of Science in the field of developmental biology. This undergraduate lab experience will help provide me with the strong background required for graduate school. In the more distant future, I aspire to become a veterinarian; having a knowledge and understanding of developmental biology will without a doubt be an asset to me in this field of work, as well.”

Name:	Michelle Young
Supervisor:	Edmond Lou
Project Title:	Using 3D ultrasound images to guide insertion of pedicle screws during scoliosis surgery
Motivation:	"To gain experience in research as an undergraduated student in order to help decide if a career in medical research is something I would like to pursue further." "I hope to pursue a career in medicine, ideally in a specialty that will incorporate my interests in biomedical engineering."
Career Aspirations:	

"I am currently enrolled in an engineering co-op program, and I learned of this job while I was applying for one of my eight-month work terms. During my time at the Glenrose Rehabilitation Research Center I have been involved in this and other projects and have been introduced to some of the ways in which biomedical engineering can be applied to clinical research. Most of the research I have been involved in focuses on monitoring and treatment of Adolescent Idiopathic Scoliosis (AIS).

Scoliosis is a three dimensional spinal deformity characterized by lateral displacement, rotation, and tilting of the vertebrae. The majority of patients diagnosed with scoliosis are female. AIS is scoliosis which presents, with no known cause, in patients between the ages of 10 and 18.

In severe and progressive cases of scoliosis, spinal fusion surgery may be recommended in order to correct spinal curvature. During surgery, several pedicle screws are inserted along the length of the spine in order to anchor rods, which serve to hold the spine in a straighter orientation. A misalignment of a pedicle screw can potentially cause permanent neurological damage or even a life-threatening vascular injury. Because of the importance of positioning and alignment of pedicle screws, several three dimensional navigation systems have been developed for use in spinal fusion surgery. The drawback of existing systems is that they rely on intraoperative imaging modalities which expose the patient and surgical team to ionizing radiation. The goal of this project is to investigate if 3D ultrasound, a non-ionizing imaging modality, can be used to aid in the insertion of pedicle screws."

Our Science Shop Awardees

Name:	Maira Quintanilha
Supervisor:	Rhonda Bell and Maria Mayan
Project Title:	Enhancing evidence about nutrition programming to urban, African-immigrant women during pregnancy and postpartum
Community Partner:	Multicultural Health Brokers Co-operative
Motivation:	"Pregnancy and postpartum represent optimal periods for engaging women in strategies that promote healthy behaviours including optimal dietary intake. However, any strategies targeted at urban, immigrant women need to take into consideration socio-environmental factors that influence their diets and other health behaviours, and understanding these factors is one of my greatest motivations!"
Career Aspirations:	"My goal is to become a scholar who has a thorough understanding of prenatal nutrition, community-based research, qualitative methods and knowledge translation so that I can work in a position where I can be the interface between research and dietetic practice."

"Gestational weight gain (GWG) and dietary intake are important predictors of pregnancy outcomes. Too little or too much weight gain during pregnancy puts both mother and baby at a higher risk for complications of pregnancy and long-term risk of chronic disease. Yet, many women especially those who experience socio-economic and cultural barriers to health services remain unaware of recommended pregnancy weight gain guidelines or find it difficult to obtain guidance on how to eat healthy and gain weight appropriately during pregnancy.

My research project for this summer is entitled "Enhancing evidence about nutrition programming to urban, African-immigrant women during pregnancy and postpartum." It aims to understand urban, African-immigrant women's perceptions and experiences during pregnancy and postpartum in relation to socio-environmental factors that may influence healthy eating and appropriate weight management. We believe this is an important step in the process of developing selected strategies that are safe and can truly speak to women's needs during these vital periods of their lives.

My PhD research project is part of a larger research program entitled ENRICH (http://www.enrich.ales.ualberta.ca/), and various members of the ENRICH team encouraged me to apply for the WCHRI & CUP Summer Science Shop and engage in CBR throughout the summer.

The learning opportunities I have had through the WCHRI & CUP Summer Science Shop have been outstanding, and really important to my growth as a community-based researcher!"

Name: Megan Lukasewich
Supervisor: Cindy Jardine
Project Title: The impact of participatory approaches to research on Aboriginal youth's health and wellness
Community Partner: Queen Elizabeth High School, Edmonton, AB & K'alemi Dene School, N'dilo, NWT
Motivation: "My motivation for conducting this research was to work with youth to create a different story than the commonly portrayed image of youth as problems; rather showing how youth are resources for positive community change."
Career Aspirations: "To pursue a career as a health policy and program developer in the Canadian Arctic. I am particularly interested in a position where I can engage and partner with youth throughout the process, ensuring the programs developed are relevant and meet their needs."

"Research Project: Situated within the larger project 'Engaging Aboriginal Youth in Tobacco Prevention Using Social Media' (PI: Jardine) I am determining how the process of youth inclusion in a community-based participatory research (CBPR) project affects factors that are central to youth's personal health. I am exploring from the project participant perspectives, what the impact is of participating in a CBPR project on their health and wellness. The study population is comprised of Aboriginal youth (14-18 years old) residing in Ndilo, NWT and Edmonton, AB. To understand the effects of the project, from the perspectives of the participants, I have conducted 11 focus groups with youth participants (n=28) and 16 one-on-one interviews with the adults partners (principals, teachers and film makers).

This research will provide empirical evidence on the health impacts of including youth in CBPR aimed at smoking prevention. The results will provide information on: 1) how factors that are central to youth's personal health change through participation in CBPR; and 2) how acting as health promotion leaders in their community impacts their wellbeing. Determining the impact of CBPR to empower youth to be agents of change has the potential to influence the way research, programs and policies are created with Aboriginal youth.

My motivation for conducting this research was to work with youth to create a different story than the commonly portrayed image of youth as problems; rather showing how youth are resources for positive community change. Moreover, I aim to add to the limited body of literature on including youth in research projects, and how this is a health promotion process that has the potential to positively impact their health and wellness.

What I learned: During the WCHRI/CUP Science Shop I learned how to carry out a content analysis and how to conduct knowledge translation activities. Through the relationships I built with the youth, I learned the value of remembering that everyone has their own story and how important it is to approach your work with an open mind and a good heart."

Name:	Priatharsini (Tharsini) Sivananthajothy
Supervisor:	Dr. Jane Springett
Project Title:	Understanding perceptions of community engagement held by stakeholders within the family care clinic planning process
Community Partner:	Multicultural Health Brokers Cooperative.
Motivation:	"With the development of new family care clinics (FCCs), I believe it is a critical moment to assess and learn about the importance and challenges of incorporating the communities' voice within new health delivery systems such as FCCs."
Career Aspirations:	"I believe this studentship will be a stepping stone in developing a career in community in based research. I hope to pursue further studies, which expand my knowledge and skill set in community-based research in the future."

"Early childhood is the most important developmental stage associated with predicting educational attainment and adult productivity [1]. Theories of development emphasize the influence of reciprocal interactions between caregivers and children in creating stable and nurturing relationships [1, 2]. However, the socioeconomic context, which allow these relationships to be created, are only marginally considered within early childhood programs. Specifically within low-income households, parents are fiscally unable to support their families resulting in the deterioration of family relationships directly impacting the children. Recently, Alberta Health has proposed a health service delivery system through family care clinics (FCCs) in order to create an integrated, community based, comprehensive primary health system. As the first point of contact for families, FCCs are key in addressing the health issues of immigrant communities, specifically children. As FCCs aim to serve the needs of each community, community engagement provides a platform for collaboration between majors stakeholders including health service providers, and community members.

However, community engagement is not a documented definite process and perceptions vary. A descriptive qualitative study was conducted to explore the perceptions of community engagement surrounding FCCs in Alberta. Six in-depth interviews were conducted with FCC administrators, Alberta Health Service employees and community members. The results of this study will be used to inform a report to Alberta Health to assist future FCC applicants to better engage with communities and designs FCCs to serve the health and social needs of the communities."

WCHRI would like to thank all the participants, supervisors, mentors and community partners who participated in this year's program!

Visit our website to find out more about the Summer Studentship programs: http://www.wchri.org/summer-studentship-awards. and Science Shop programs: http://www.wchri.org/wchri-cup-science-shop-summer-studentships.